Manpower Planning Project Training Workshop

Yemen Arab Republic

Volume 1

DOS
SPSS-PC+™
ENABLE™
LOTUS 1•2•3™
Introduction to Statistics

Albany, New York
January 1989

IEES

Improving the Efficiency of Educational Systems

The Florida State University
Howard University
Institute for International Research
State University of New York at Albany

United States Agency for International Development
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Volume 1: DOS/SPSS-PC+/ENABLE/LOTUS 1•2•3
Introduction to Statistics
Volume 2: Manpower Education Model
Volume 3: Manpower Education Model (Exercises, Reference, Summary)

An English/Arabic glossary of Labor Force and Manpower terms is provided in Volume 1.

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Gratitude is expressed to the World Bank, who made their Manpower and Education Model available for training purposes during this workshop.

Volume 1

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BASIC INFORMATION

Components of a Typical Computer System

A typical computer system consists of these six components:

1. the central processing unit (CPU)
2. the memory (RAM and ROM)
3. one or more disk drives (internal and/or external)
4. a keyboard
5. a monitor
6. a printer

The Central Processing Unit (CPU)

The **CPU** is the part of the computer which directs the computers operations. It performs all the analytical and computational functions that occur inside the computer system. The CPU operates by performing a list of instructions (programs) which are controlled by the **disk operating system** (DOS). The disk operating system is discussed in a separate section of this manual.

The Memory

The memory stores information that will be processed by the CPU. The memory is made up of **bytes**. A byte is a single character of information. (Each letter or number is a character.) For example, a computer with 256,000 bytes of memory can store in its memory 256,000 characters. A common computer memory capacity is 640KB. KB (sometimes just K) stands for **kilobytes**. There are1024 bytes to a kilobyte.

There are two types of memory:

1) Random Access Memory (**RAM**) - The computer has mostly this type of memory, and it can be used to store and retrieve any type of information.

2) Read Only Memory (**ROM**) - The contents of this memory are not readily changed. ROM stores the information that the computer needs when it is first switched on.

The Disk Drives

The disk drives are used to "read" and "write" information to and from a diskette. (The disk stores information on its surface.) Whenever a drive is in use, a light will be on. It is important that you do not move the computer or (if it is a floppy drive) open the drive door when the light is on, as damage or loss of information may result. All disk drives have two important elements:

1) A read-write head - This is used to read information that is on a disk and to write information onto the disk. (The read-write head performs a similiar function as the recording heads in a tape recorder.)

2) A means of spinning the disk - The read-write head can only read from or write to a small part of the disk's surface at one time. Therefore, the disk must turn in order to allow the head access to its entire surface.

Computers may have two types of disk drives:

1) **Floppy disk drives** - Usually known as the A or B drive on a computer. The floppy disk drive gets its name from the type of disk (the floppy disk) that is inserted into the drive. Each floppy disk typically can hold 256KB of memory. Closing the door of a floppy drive also informs the computer that a disk has been inserted. It also prepares the disk turntable to spin the disk across the read-write head, thus allowing access to the information on the disk.

NOTE: Always take care when handling floppy disks, and when you insert them into the computer do so gently. Damaged disks are unreadable.

2) **Hard disk drives** - These are usually known as the C drive, and are also called "fixed" drives. They support the computer's resident "hard disk." The hard disk is capable of storing a large amount of information, for example, a common hard drive would might have a memory capacity of 20MB (MB is short for **megabytes**. There are one million bytes in a megabyte.). Hard drives are often preferred as they permit the user to store both their software programs and files inside the computer. They are also faster to work with than floppy disks and don't damage as easily. The read-write heads on a hard drive are permanently positioned very close to the

surface of the hard disk. Therefore, moving the computer must be done with care, as it is possible that any sudden movement may cause the hard disk drive to scratch against the magnetic surface of the disk, and this will result in a loss of information and quite possibly permanent damage to the disk.

NOTE: There is a program in DOS which you can use to lock the read-write heads in place for greater safety in moving.

The Keyboard

The keyboard allows the user to communicate with the computer. There are over 80 keys, some of which serve specialized functions, and on many keyboards most keys can represent both Arabic and English characters. The keys include:

- Letters - a,b,c, etc.
- Numbers - 1,2,3, etc.
- Functions Keys - F1, F2, F3, etc. These keys serve a different purpose for each type of software used.
- Arrows to move the cursor around the screen.
- Caps Lock and Num Lock
- Insert and Delete
- Alt and Ctrl (control)

NOTE: As you progress, the particular uses of the keys which are unfamilar or not self-explanatory will be made clear to you as you need them.

The Monitor

The monitor is the screen that displays information following instructions that the user keys into the CPU using the keyboard. The monitors are either monochrome (one color only) or color ("full color," usually 16 or 32 colors.) Color monitors are an aid to graphics use and some word processing programs.

The Printer

The printer provides a paper copy of your file, or just a few parts of it. The paper copy is often referred to as a "hard copy." A special cable connects the printer to the CPU.

NOTE: Printers can be permanently adjusted to print in both Arabic and English.

Using the System

Turning on the System

Most computer systems which have hard disk drives have DOS loaded onto the default drive, which is the C drive. When you turn on the computer, the following will appear on the screen:

Current date is day nn/nn/nnnn
Enter new date (dd-mm-yy):

You will type either **[Return]** (or < >), or correct the date as necessary using the format shown on the screen, then press < >.

For example, you would type: **(08-11-88)** < > if today is November 8, 1988.

You will then see on the screen:

Current time is nn:nn:nn,nn
Enter new time:

Now you will type either **[Return]** (or < >), or correct the time as necessary using the format shown on the screen, then press < >.

For example, you would type: **09:15:00,00** < > if the time is 9:15 in the morning.

You will then see:

IBM Personal Computer DOS version 3.30
Mode prepare codepage function competed
Arabic Support Version 4.0
(c) Copyright IBM Corp. 1984, 1987
ARABIC SUPPORT SPECIFIED AND LOADED
C:\>

Locating files on disks

The floppy disk drives are typically A and B. Drive A is the floppy disk drive that is an internal part of the CPU. Drive B may be an internal floppy disk drive or one which is external. Drive C is a hard disk drive that is resident in the computer.

The computer will recognize these drives as:

A: **B:** and **C:**

The colon (:) is always used after the drive letter, as it is used to separate the drive name from the file name.

The system prompt

The prompt contains the default (automatically selected) drive and a symbol:

A:> **B:>** or **C:>**

It may also contain the name of your current directory (a sort of electronic file folder in which contains you place files that are somehow related to each other). For example:

A:\LETTERS>

indicates you are using the disk in drive A, and are in the directory called LETTERS.

If you are working in drive C the computer will have a C:> prompt (typically known as the C prompt). Typing LETTER1.DOC after the prompt (the screen will display this: **C:>LETTER1.DOC**) and pressing < > tells the computer to locate that file on the C

drive. The computer then opens that file and displays it on the screen.

The same procedure is followed to call up a file which is on a disk located in either the A or B drive, except that the prompt will be either the A prompt (**A:>**) or the B prompt (**B:>**).

If you are working in one drive and the file you wish to locate or use is in another drive, you will first have to change drives before the file can be brought to the screen. Word processing programs will do this within themselves. Other software, including DOS, requires you to identify the file you need by using its pathname. For example,

A:\LETTERS\LETTER5.DOC

will cause the computer to look on the disk in drive A in a directory called LETTERS for a file named LETTER5.DOC.

To Change Drives

Changing from the A to the C drive is easily done.

On the screen you see:	**A:>**	(the on-screen prompt)
You now type:	**C:**	(**A:C:** is now on the screen)
		press **< >**
You now see	**C:>**	(the new on-screen prompt)

If you do not specify a drive, DOS automatically searches the default drive. On computers with hard disk drives, the C drive is usually the default drive.

Backing up your data

It is best to always make copies of your software program disks and your data disks. This provides you with a second copy, just in case you accidentally delete needed files or you damage your disks. You can then use the program copies you made instead of the expensive originals. Back up your copies frequently, particularly if you repeatedly add data or modify your files.

Establishing a routine of backing up **any** files you have worked on when you are

finishing a session at the computer is an excellent idea.

Turning off the system

To turn off the computer, return from the root directory, C:\>, and remove any floppy disks from the drives. Then you can turn off the computer. Do not turn the computer on again for at least two minutes.

DOS

DOS

Introduction

DOS is a disk operating system consisting of a variety of programs which allow you to run application programs (programs designed to do a particular task or set of tasks, such as ENABLE™, LOTUS 1•2•3™, and SPSS-PC+), store, and interact with files on your disk. It also provides the capability to use a printer and other peripheral devices. Basically, DOS translates information received from the keyboard into the binary code which the computer's CPU understands. Knowledge of a variety of DOS commands is both necessary and useful to the PC computer user. Knowing these commands will allow you to format your disks so they may be used, copy and store files, and delete files which are no longer useful. There are two versions of DOS, each developed by a different company but both very similar. The commands presented here will work in either version of DOS.

Using DOS

DOS Commands

DOS commands must be typed exactly as they appear in these notes or a DOS manual. Small differences may seem trivial because humans can infer meaning despite errors in text, but computers cannot. You will quickly find out that typing ";" when you should type ":" will result in an error message being displayed and your command not being executed. This sort of mistake is common, particularly when beginning, so don't worry when it happens to you. Just retype the command.

The only exception to the rule of exact typing is that you may type in either upper case (CAPITAL) letters or lower case letters. For ease of instruction, all DOS commands will be in capitals throughout this manual. To send the command typed on the keyboard to the CPU, you must always press either the **[Return]** or **[ENTER]** key. Examples do not include the **[ENTER]** (< >) command, because it is always used, but be sure to press it unless instructed not to do so.

Starting DOS

Starting DOS (also called "booting DOS") can be done in two ways. The first way, used when the computer is off, is to put the diskette containing DOS (the "DOS disk")

into disk drive A and turn the computer on. This is called a "cold boot." The second way, when the computer is turned on, is to put the DOS disk into drive A and type simultaneously the **[Ctrl]** - **[Alt]** - **[Del]** keys. (The easiest way to type all three at once is to hold down two of them and then press the third.) Rebooting when the computer is turned on is called a "warm boot." If you are starting from a hard disk, you may have DOS start automatically.

Stopping a DOS Command

To stop DOS from completing a command once you have pressed **< >**, press **[Ctrl]** and **[Break]**. This is a DOS command which does not require that you press the **< >** key.

Useful Keys

Some useful keys to know about when using DOS, and their functions, are presented below.

Press **[Enter]** (**< >**)	To enter a DOS command
Press **[Break]**	To stop a DOS command from completing its task
Press **[Backspace]**	To correct an error when typing a DOS command
Press **[Print Screen]** (**Prt Sc** on some computers)	To print whatever is on the screen

Working with Files

Files and Where they are Kept

A file is a collection of information that is stored together for preservation or reference. You can preserve Ministry records, data files, or useful documents. For reference you can store current reports, personnel information, and correspondence.

Creating a file may be viewed as grouping related information so that it can be easily accessed. Files are stored on either floppy diskettes (disks) or fixed (hard) disk drives.

Naming files

Good filenames are descriptive and easily remembered. These rules apply when

naming a file: (1) Files have a filename and an optional extension. For example:

LETTER1.TXT

LETTER1 is the filename and TXT is the extension. A filename with an extension is usually called the file specification (filespec).

NOTE: You cannot use the following characters in a filename or extension: " \ / [ ] : ; | < > + = . , * ? nor can you insert a blank or space in a filename. You can mix letters, numbers, and symbols as desired.

Filenames can be up to 8 characters long (7 in Arabic/DWA). Extensions can be up to 3 characters long (2 in Arabic/DWA). Filenames and extensions are always separated by a period. If you use both a filename and an extension you must use both whenever you call up that file on the computer.

The following extensions have special meanings and are used by DOS. Avoid using them unless the computer automatically adds them to your filename, as will occur when using some programs.

.BAK	.BAS	.BAT	.CHK	.COM
.EXE	.MAP	.OBJ	.REC	.SYS

Pathnames

For DOS to locate a file that is not located in the current directory, you must tell DOS where to locate it. You do this by specifying a pathname. The pathname is a sort of electronic road to the file.

A **pathname** lists a **drive**, a **directory** and a **filespec** with a series of backslashes (\) separating each of them. A **path** is a list of directory names separated by backslashes. A complete pathname is written as:

d:\DIRECTORY\FILENAME.EXT

where d: is the drive name (usually **A:**, **B:**, or **C:**), DIRECTORY is the name of your directory (enter as many directory names as there are in the branch to the file you want to use), and FILENAME and EXT is the file that you want.

If the diagram shows the tree for your fixed drive C, then the pathname for the file REPORT2.DOC would be:

C:\PROGRAMS\MOCSAR\REPORT6.DOC

Wildcards

Wildcards give you access to several files with just one command. You can use either * or ? as wildcards in either filenames or extensions. You can substitute the wildcard characters for any character or group of characters in the filespec. The wildcard * can be used in place of 1 - 8 characters, and the wildcard ? in place of one character.

NOTE: Be careful when using wildcard characters. If they are not used properly you may accidentally erase important files. For example:

DEL LET*.TXT

will delete all the .TXT files that begin with LET. These may include:

LETTER1.TXT **LETTER2.TXT** **LETDOWN.TXT**

and so on, when you may have wanted to delete only the "letter" files.

NOTE: *.* specifies all files in the default (current) directory. Therefore, *.* must be used with great care.

Directories

Files are stored in a directory. Usually related files are stored together. DOS updates the directory each time you add, delete, or revise a file. In addition to the filename, the directory stores other information about your files. The screen typically looks like this when displaying a directory:

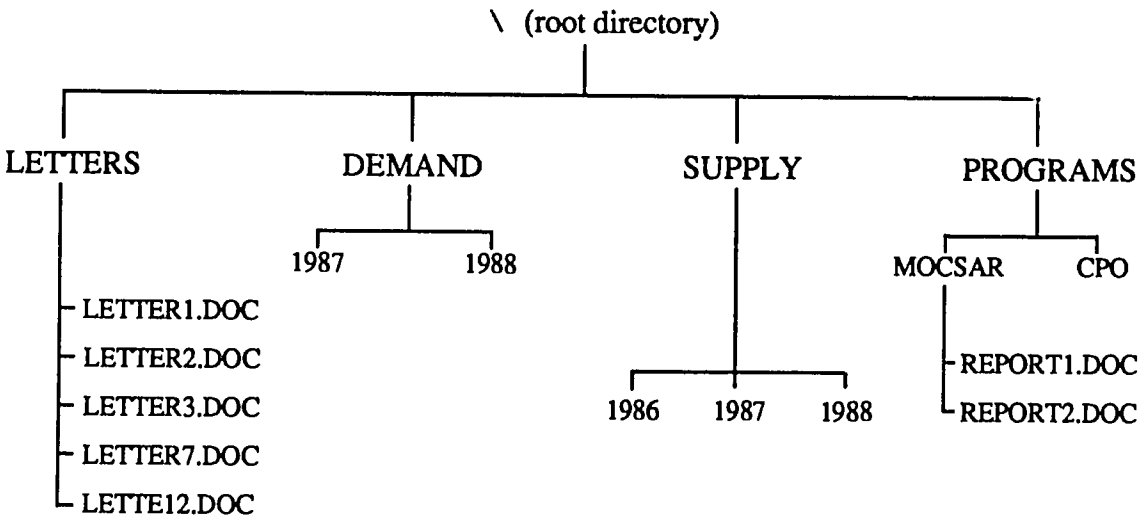
Volume in drive A has no label
Directory of A:\Mamoud

.	<DIR>	8-12-88	2.35p
..	<DIR>	8-12-88	2.35p
letter1 txt	3207	8-13-88	9.00a
letter4	6754	8-23-88	11.45a
demand87 doc	4332	8-23-88	1.37p
supply87 doc	3321	8-24-88	9.56a
	6 file(s)	345876 bytes free	

The first column lists the filenames, for example: demand87.
The second column lists the extensions, for example: txt.
The third column lists the current size of the file in bytes, for example: 3207.
The fourth and fifth columns list the date and time the file was last changed, for example: 8-12-88, 2.35 p.

The directory structure

DOS has a directory system that allows you to group files. First, you can group related files into directories and subdirectories, such as LETTERS or 1986 (see below), then you can group related directories in a structure called a **tree**. The **tree** is also called the root directory. The root directory is the main directory on a disk, and it cannot be deleted. The "tree" grows as directories are added. This is illustrated on the following chart:



On the directory tree above:

The root directory (\ ) has 4 **subdirectories:**	**LETTERS**
	DEMAND
	SUPPLY
	PROGRAMS
The subdirectory **SUPPLY** has 3 subdirectories:	**1986**
	1987
	1988
The subdirectory **MOCSAR** currently contains 2 files:	**REPORT1.DOC**
	REPORT2.DOC.

NOTE: DOS automatically creates the root directory when you format a disk.

Current Directory: The current directory is the one that you are working in at any given time.

Default Directory: The default directory is the directory that the computer automatically goes to.

*Creating a directory:**MKDIR***

To create a subdirectory MOCSAR under your root directory, enter the following command:

MKDIR\MOCSAR

The backslash tells DOS to start at the root directory. To create a directory elsewhere in the tree, enter the **MKDIR** command and a pathname, for example:

MK\MOCSAR\LETTERS

This creates the subdirectory LETTERS under the MOCSAR subdirectory.

NOTE: MK is usable as a short form of **MKDIR**, as shown above.

Deleting a directory: ***RMDIR***

You can only delete a directory if it is empty. It cannot contain any files or subdirectories. You cannot delete the root directory.

Use the **DIR** command (see page D-11) to list the files and subdirectories on your disk, and use the **DEL** command (see page D-17) to delete the files. To delete the subdirectory MOCSAR you must first delete the subdirectory LETTERS. After deleting all files the following command would delete the LETTERS subdirectory:

RMDIR\MOCSAR\LETTERS

Then to delete the MOCSAR subdirectory, type:

RD\MOCSAR

Both directories will then be deleted.

NOTE: You should backup any files you need (copy them to another drive or directory) prior to deleting the files from a directory which is to be deleted.

NOTE: RD is usable as a short form of **RMDIR**, as shown above.

Changing directories

To work in another directory you use the change directory command, **CHDIR**. If you are working in the root directory and wish to change to the MOCSAR subdirectory, you enter:

CHDIR\PROGRAMS\MOCSAR

This will take you to the MOCSAR subdirectory of the PROGRAMS subdirectory. If you are moving to a directory that is an immediate subdirectory of the one you are working in, do not type the backslash. For example, if you are moving from the root directory to the DEMAND subdirectory, you could type **CD** as a short form of **CHDIR**:

CD\DEMAND

If you want to display the name of the current directory, type:

CD

DOS Command Summary

What is a DOS command?

A command is an instruction telling DOS what to do. You can use DOS commands to:

- copy, display, compare, rename, and delete files
- backup and restore files
- format disks so they may be used in the computer
- copy entire disks
- perform many other functions

Command syntax refers to how the command is written: what words and symbols are used, and in what order they are. Order is very important. The syntax consists of two parts: the name of the command followed by the options that give instructions or information to DOS. It is important to type the command exactly as shown. For example:

DIR/P

where **DIR** is the name of the command (short for directory) and requests a listing of the contents of a directory, and **/P** is an option which requests that it be presented page-by-page (one screen at a time).

Selected DOS Commands

The following most commonly used DOS commands are explained in detail:

DIR	Gives a directory listing
FORMAT	Prepares a disk for use with DOS
COPY	Copies files
DISKCOPY	Copies the contents of an entire disk
DELETE	Deletes specified files
TYPE	Displays the contents of a file
RENAME	Renames files
CHKDSK	Checks the directories and files on a disk for errors and provides a disk and memory status report

BACKUP	Backs up files (stores)
RESTORE	Transfers files from a backup disk to another disk

When you are completing the exercises for each command, take time to write down what you see on the screen. The already formatted disk given to you as part of this manual is called SAMPLES. The other disk provided to you is blank.

DIR

The **DIR** command is used to get a listing of all the files and subdirectories in a specified directory.
A directory typically looks like this when displayed on the screen:

```
Volume in drive A has no label
Directory of A:\Mamoud
.              <DIR>          8-12-88    2.35p
..             <DIR>          8-12-88    2.35p
letter1  txt       3207       8-13-88    9.00a
letter4            6754       8-23-88   11.45a
demand87 doc       4332       8-23-88    1.37p
supply87 doc       3321       8-24-88    9.56a
                          6 file(s)  345876 bytes free
```

The files are listed with their filenames, extensions, the size of the file, and the date and time when information was last entered into the file. After the file listing, **DIR** displays the amount of free space on the disk (in bytes) and returns you to the drive prompt (for example, **C:>**).

DIR has several options available, which can be combined:

DIR	will list all the files in the current drive
DIR A:	will list all the files in the A drive
DIR/P	will list all the files on the C drive (the current drive) page-by-page (screen-by-screen)
DIR A:/W	will list all the files on the A drive across the width of the screen
DIR\PROGRAMS\MOCSAR	will list all the files in the MOCSAR subdirectory of the PROGRAMS subdirectory

FORMAT

The **FORMAT** command is used to instruct the computer to prepare disks for use with DOS. **FORMAT** also analyzes the entire disk for any defective tracks and prepares the disk to accept DOS files.

All new disks must be formatted before they are usable.

Important: FORMAT erases any existing data on a floppy or hard disk. If you format a disk that already has files on it, they will be destroyed, and you will lose the information in those files.

To format a disk, type:

FORMAT A:/S

This command specifies the drive that the disk to be formatted is in, and the /S option. The /S option copies three system files to the formatted disk:

IBMBIO.COM	this is a hidden file and will not appear in the directory listing
IBMDOS.COM	this is a hidden file and will not appear in the directory listing
COMMAND.COM	this file will appear in the directory listing

You can also use the following command to format a disk:

FORMAT A:/V/S

This command will copy the system files to the disk and allow you to assign a volume label to the disk.

After formatting is complete you will be asked:

Enter current volume label for drive A:

During formatting the screen will provide information on the process:

0 heads 0 cylinders

This is followed by:

Format Complete
xxxxxx bytes total disk space
xxxxxx bytes available on the disk

Do you wish to format another disk? Y/N

Use the **DIR** command to see the directory of your disk. This will assure you the formatting procedure was accomplished correctly.

COPY

The **COPY** command has several options. You can use the **COPY** command to copy one or more files:

- to the same disk and the same directory by specifying a new filename
- to the same disk but another directory and the same filename
- to the same disk, another directory, and a new filename
- to another disk with the same filename
- to another disk with a new filename

Here are examples of each of the above:

• Copying to the same directory with a new name.
Typing:

COPY A:LETTER1.DOC BUDGET1.DOC

will copy the file LETTER1.DOC into the same directory, naming it BUDGET1.DOC.

• Copying with the same filename to another disk.
Typing:

COPY C:LETTER1.DOC A:

will copy the file LETTER1.DOC from the C drive to the A drive.

• Copying with a new filename to another directory.
Typing:

COPY C:LETTER1.DOC \DEMAND\BUDGET1.DOC

will copy the file using the name BUDGET1.DOC to the directory called DEMAND.

• Copying with the same filename to another directory.
Typing:

COPY A:LETTER1.DOC A:NEWTEXT.TXT

will copy the file LETTER1.DOC directly from the A drive into another directory.

• Copying to a different disk with a different filename.
Typing:

COPY C:LETTER1.DOC A:NEWTEXT.TXT

will copy the file LETTER1.DOC from the C drive to the A drive and also rename it NEWTEXT.TXT.

When copying files you must always include a file specification, or use the wildcard character options. If you use any of the wildcard characters during copying, DOS will display the filenames as they are copied.

CAUTION: You should be very careful in using the wildcard characters in the **COPY** command, because you may destroy data. Always use the **DIR** command to display your filenames so you can be sure of the files you want copied.

You should always check your copying by looking at the directory which the copied file(s) went to.

DISKCOPY

The **DISKCOPY** command copies the contents from one disk to another. The **DISKCOPY** command copies floppy disks only. It will not copy a hard (fixed) disk. The command is written like this:

DISKCOPY A: B:

this will copy the entire contents of the disk is the A drive to the disk in the B drive. DOS will the display the following message when it is ready to make the copy:

Insert source diskette in drive A:
Insert target diskette in drive B:
Press any key when ready...

If you use an unformatted disk as your target disk, **DISKCOPY** will format it automatically. **DISKCOPY** copies the entire disk including the hidden files, and is much faster than copying files individually.

NOTE: Any files on the target disk prior to copying will be erased during the **DISKCOPY** procedure. If any files are on the target disk, be sure they have been copied to another diskette or are no longer useful.

DELETE

The **DELETE** command allows you to delete specified files. For example, typing:

DEL LETTER6.DOC

will delete the file LETTER6.DOC from the current directory. **DEL** is a short form of **DELETE.**

You should be sure that you know the contents of a file before you delete it. Once a file is deleted, the information is gone, so take a little time to check the contents unless you are positive about them.

If you use the wildcard character ***.*** when deleting, DOS will ask you:

"Are you sure (Y/N)?"

Typing **Y** will delete all files in the specified directory.

CAUTION: You should be very careful in using the wildcard characters in the **DELETE** command, because you may accidentally destroy data you wish to keep. This can happen particularly easily if more than one person is using a given computer or set of disks. Always use the **DIR** comand to display your file names so that you can be sure of the files you want to delete.

You should check your deleting by looking at the directory listing after the delete command is performed.

TYPE

The TYPE command displays the contents of a file. Some files (program files, for example) will not be readable because they contain special control characters. Typing:

TYPE LETTER6.DOC

will display the contents of the LETTER6.DOC file on the screen.

You can also use the **MORE** command to display the contents of a file on the screen:

MORE LETTER6.DOC

This will display the contents on the file LETTER6.DOC one screen at a time.

RENAME

The RENAME command allows you to change the name of one or more files. For example:

RENAME A:\LETTERS\LETTER6.DOC NEWTEXT.TXT

renames the file LETTER6.DOC located in the directory LETTERS to NEWTEXT.TXT.

If you do not specify a drive, DOS assume the current drive contains the file you wish to change. If you do not specify a path, DOS will assume the current directory of the default drive contains the file you are changing.

DOS will not permit you to rename a file to a name that already exists in that directory.

REN is a short form of **RENAME**. You may use either one.

NOTE: The **RENAME** command is valid only within the current directory. Use the **COPY** command when going to another directory.

CHKDSK (Checkdisk)

The **CHKDSK** command allows you to check the files, directories, and subdirectories on a disk. It will identify errors which may be on the tracks of the disk, and will provide a disk and memory status report.

Simply type:

CHKDSK

DOS will check the disk and display a status report similar to this when finished:

750000 bytes total disk space
1024 bytes in hidden files
620500 bytes in 26 user files
128476 bytes available on disk

1024000 bytes total memory
645884 bytes free

BACKUP

The **BACKUP** command allows you to backup (store) files on other disks. For example:

BACKUP C:\LETTER*.* A:

will backup all files from the LETTERS subdirectory on the C drive (the source drive) on to the A drive (the target drive). You must indicate a target drive, and have a formatted disk in that drive. You can backup from any disk to any other disk, but the disk must be formatted in DOS. If you are backing up a fixed (hard) drive you may easily need more than one floppy backup disk.

NOTE: Files placed on a disk using the **BACKUP** command can only be accessed with the **RESTORE** command.

NOTE: If you do use more than one backup disk, you must take care to number them in the order which you use them, as the **RESTORE** command requires that you restore the files in order.

RESTORE

The **RESTORE** command allows you to transfer one or more files from a backup disk to another disk.

RESTORE A: C:\LETTERS

will transfer all files to the subdirectory LETTER, and to all subdirectories below it. Likewise, typing:

RESTORE A: C:*.*

will transfer all the files from the backup on drive A (the source drive) to the current directory in drive C (the target drive).

RESTORE displays the name of each file as it is transferred to the target disk.

NOTE: If you are restoring files from a series of disks take care to make sure that the disks are entered in the correct order.

NOTE: It is important that you follow the DOS messages carefully.

DOS Exercises

1. a. Use the **DIR** command to find out what files are on your diskette. You may want to write the names of these files down for future reference.

b. Use the **DIR** command with the **/W** option, first looking on drive C, then on drive A.

c. Create a subdirectory using the **MKDIR** command. Call the subdirectory "BACK-UPS."

d. Create a subdirectory using the **MKDIR** command. Call the subdirectory "PRAC-TICE."

e. Look on your floppy disk using the * wildcard as the filename and ASC as the extension. How many files are there?

2. a. Format a new disk using the /S option. Look at the directory on the newly formatted disk. What files are listed? Which ones have been placed on the disk? Are there files which have been placed on the new disk which have not been listed?

b. Reformat the disk you just formatted using the **/V/S** options. Use your name as the volume name. Look at the directory on this disk. What files are listed? Which ones have been placed on the new disk?

3. a. Copy the file, MEMO.ASC on your SAMPLES disk to the PRACTICE directory which is on that disk, using the same filename. Check the directory to be sure it is there.

b. Copy the file named PROGRAM1.ASC to the PRACTICE directory, changing the filename to EAPS.DES. Remember to look in the directory to be sure it was copied.

c. Try to copy file PROGRAM2.ASC into the same (current) directory using the same filename. What happens?

d. Copy the file PROGRAM1.ASC to the same directory under the filename CHOICE1.ASC. Is it in the directory?

e. Copy the file CHOICE1.ASC to the disk you formatted in Exercise 2. Use the same filename.

f. Copy the file PROGRAM2. ASC to the disk you used in (e) above, using the new filename CHOICE2.ASC.

4. Use the **DISKCOPY** command to copy the SAMPLES diskette containing the five practice files onto your other disk. Remember to look in the directory.

5. a. Use the **DELETE** command to discard the files (MEMO.ASC and EAPS.DES) you had copied into the subdirectory PRACTICE.

b. Delete the now-empty subdirectory, PRACTICE.

6. a. Using the **TYPE** command, display the file named PROGRAM1.ASC.

b. Now use the **MORE** command to examine the file named MEMO.ASC.

7. a. Using **RENAME**, change the name of PROGRAM2.ASC on your disk to:

Practice.123

After you use the **RENAME** command, check the directory using the **DIR** command to be sure the name has been changed.

b. Now change the name back to what it originally was, using **REN**. Again, check the directory to be sure the name has been changed.

8. Use **CHKDSK** to check both the SAMPLES disk and the disk you copied using the **DISKCOPY** command. Write down the status reports for each one.

9. Using the **RESTORE** command, transfer the files you recently made backups of (LETTER.ASC and REFERENC.ASC) onto the SAMPLES disk into the subdirectory BACKUPS. What do you see in the directory which had the backup copies? What is in the BACKUPS subdirectory?

ENABLE WORD PROCESSING

ENABLE WORD PROCESSING

Introduction

The information, instructions, guidelines, and exercises included in this section are designed to provide you with a basic working knowledge of Enable word processing. Once you have carefully read the first seven sections and the worked through the series of exercises you will be able to create and revise (edit) your own files (documents) and copy text from one file to another.

Almost every process in Enable can be performed using different commands, however, the commands listed in this text are the simplest Enable command for that process. When you become more familiar with Enable and the Enable documentation you may find it useful (and interesting) to work through all the top-line menu options at your leisure. After doing that you will rapidly become aware of the value of many of Enable's impressive features.

A few rules that apply to this text:

- When keys need to be pressed together the instruction will read:

press **Alt+C**

Meaning press the Alt and C keys at the same time.

- When keys need to be pressed in sequence the instruction will read:

press **F9**
M
+

Meaning press F9 then M then +.

The explanation on the right is simply to illustrate what each keystroke in the command represents.

Throughout the text, the symbol < > will be used to indicate that the Enter key must be pressed.

Section 7 is a comprehensive listing of Enable commands.

Screens, Menus, and the Status Line

Getting to know your way around the Enable menus is essential if you are to become familiar with all Enable's features. Like most word processors Enable is menu driven; that is to say, you can select options from a series of menus. Although many of the instructions in this text do not rely on using the menu options, a working knowledge of the basics (listed below) is necessary to function within Enable.

The Sign-On Screen

When you sign on to Enable from DOS the first thing you will see is the sign-on screen. The screen asks for the **date** and the **time**. It also asks whether you use **profiles**. DOS will automatically set the date and time so there is no need to respond to those prompts, and as installation of Enable involves the setting of a default profile you can simply access Enable by following the instructions on the bottom of the screen:

Press End

NOTE: A **profile** is a set of data that tells Enable how you want the software to function and what kind of hardware you are using. Enable users set a default profile that fits their own requirements.

The Main Menu

After pressing End on the sign-on screen, the Main Menu appears. The Main Menu lists the sections of Enable that you can access. It moves from system options to program options to sub-options. You can use the arrow keys to move around the screen, selecting options.

ENABLE(tm)

Select an option with the cursor and < >

Press Esc if you change your mind and F1 if you need help.

(System Options) **Use System Help MCM Return to DOS**

(Program Options) **Word Processing Spreadsheet/Graphics Telecom DBMS/Graphics**

(Sub-options) **Create Revise Print Dictionary Mail Merge**

(This last line on the Main Menu shown lists the word processing options.)

The Top-Line Menu

The top-line menu can only be accessed once you are working on a file. To access the top-line menu press **F10** and the top-line menu will appear across the top of the screen.

Enable's Top-line Menu

EditOpts Layout Copy Delete Find MCM Print Save 1-DBMS 2-Spell Quit
Displays draft/final reformat attributes comments paperclips blocks

The second line on the top-line menu displays the options available under **EditOpts** (Editing Options).

If you select an option from the top line menu (either by using the arrow keys and pressing the Enter key (< >), or by typing the first letter or number of the option) a pull-

down menu will appear on the screen listing the sub-options.

Enable's pull-down menu for the **Layout** option:

Select the layout option you want by typing the option number.

1. Insert a ruler
2. Insert default ruler
3. Set line spacing
4. Insert a page break
5. Insert a header
6. Insert a footer
7. Use special characters
8. Create a footnote
9. Table of contents options
0. Index Options
A. Shorthand

Pressing **Esc** will delete the pull-down and top-line menus one by one. Press once to delete the pull-down menu, and once again to delete the top-line menu.

The Status Line

The status line is located at the bottom of the screen. It provides information about the file you are currently working on:

#1 REF/B A:SAMPLE.WPF DRAFT L00010C060

#1 Refers to the window that is open and currently in use.

REF/B Refers to the Reformat mode. If the text is edited it will adjust to fit in the margins set for the document.

A:SAMPLE.WPF The drive (A:) the filename (Sample) and the extension (.wpf).

DRAFT	The document appears on the screen in the draft mode; this is not the way it will look when it is printed.
L00010C060	Gives the exact location of the cursor in the document. In this case Line 10 and Column 60.

Accessing Files

Revising a file

1 - Access ENABLE by typing **EN** at the C: prompt. (An autoexec batch file on the C drive simplifies access to Enable; if the autoexec file is not installed on your C drive, type **EN200**.)
2 - View the next screen, follow the instructions at the bottom of the screen. Press **End** to get the Main Menu.
3 - Using the arrow keys select: **Use System**
Word Processing
Revise
4 - Type in the name of the file you wish to revise: **A:filename.ext** if the file is on A drive, or **C:filename.ext** if the file is on the C drive.

Creating a File

1 - Access Enable by typing **EN** at the C:prompt.
2 - View the next screen, follow the instructions at the bottom of the screen. Press **End** to get the Main Menu.
3 - Using the arrow keys select: **Use System**
Word Processing
Create
4 - Type in a name for the file you wish to create **A:filename.ext** to create a file on the A drive, or **C:filename.ext** to create a file on the C drive.

Setting a Ruler for a Document

The ruler defines the width of the text that your document is restricted to and contains

any tab markers you may wish to set. The ruler appears at the **top of the document.**

The Enable Ruler

L———T——T————————+————————————————R

When you create a file, you will be asked if you wish to accept the default ruler (the default ruler that was set when Enable was installed). If you do press **< >**. If you wish to change the default ruler, use the following letters:

L for the Left Margin.
T for the position of a Tab.
R for the Right Margin

Move the cursor to the position you select for the left margin and press **L.**
Position the cursor for any tabs you would like, and at each tab position press **T.**
Move the cursor to the position you would like for the right margin and press **R.**
Press **< >.**

Saving a File

1 - Press **F10** (to get the top-line menu)
2 - Select Save by typing its first letter: **S**
3 - Select Accept by pressing **< >**
The status line will show a **BUSY** notation as the file is saved.

You can also save a file by typing **Alt+F10** then **< >.**

Quitting a file

1 - Press **F10**
2 - Press **Q** for Quit
3 - Press **Y** for Yes

NOTE: This will **not** automatically save your file.

Enable Commands

Function Keys

F1	Displays the help screen. (Try this function to get help from Enable.)
F2	Used in cursor control (with other keys) for moving around the screen.
F3	Inserts a line above the cursor.
F4	Deletes a word at the cursor.
F5	Repeats the current text find activity.
F6	Repeats the current text find and replace activity.
F7	Marks a block of text.
F8	Copies a block of text.
F9	Used in expert commands (with other keys).
F10	Displays the Top-Line Menu.
Alt+F1	Displays function key chart (this chart).
Alt+F2	Prints the file.
Alt+F3	Deletes a line at the cursor. (**Esc** will undo the delete.)
Alt+F4	Centers the text on that line.
Alt+F5	Copies a block from another window.
Alt+F6	Inserts a ruler above the cursor.
Alt+F7	Deletes block markers.
Alt+F8	Moves a block.
Alt+F10 < >	Saves a file.

Expert Commands

Moving Around the Screen

PgUp	Moves the screen up half a page.
PgDn	Moves the screen down half a page.
Ctrl+PgDn	Moves the screen down a full page.
Ctrl+PgUp	Moves the screen up a full page.
Ctrl+Home	Moves the cursor to the beginning of the file.
Ctrl+End	Moves the cursor to the end of the file.
Tab	Moves the cursor to the next tab marker.
F2+Home	Moves the cursor to the beginning of the page.
F2+End	Moves the cursor to the end of the page.

The Insert and Delete Keys

Insert	Turns the insert function On/Off
Delete	Deletes the letter at the cursor

Working with Blocks - Moving, Copying, and Deleting

Text to be copied or moved is first put into a block. Before you can move, copy or delete a block of text the block has to be highlighted on the screen. This is done by marking (setting) the beginning and end of the text to be blocked.

• Setting a Block:

1. To set a block of text across the screen:

   a. Position the cursor on the first character of the text to be marked and press **F7**.
   b. Move the cursor to the last character of the block to be marked and press **F7** again. This will highlight the text in the block.

2. To set a column of text as a block:

   a. Position the cursor on the first character of the text to be marked as a column block (the upper left corner of the column) and press **F7**.
   b. Move the cursor to the last character of the block to be marked as a column block (the lower right corner of the column) and press **Shift+F7**. This will highlight the text in the block.

• Removing a Block Setting:

If you make a mistake setting a block, simply place the cursor anywhere on the block, press **Alt+F7**.

• Moving a Block

Position the cursor at the new position, press **Alt+F8**.

• Copying a Block

Position the cursor at the position for the copy to appear, press **F8**.

• Deleting a Block

Press **F9**
Del
B

Copying Text from File to File

If you are working in one file and wish to copy text into that file from another file, it is necessary to bring that second file to the screen. This is done by opening a second window (the file you are working on occupies the first window). Window numbers can be located at the bottom left corner of the screen on the status line.

• When you are working on one file and wish to open another:

Press **F9**
W
O

Enable will then display the Main Menu and you can proceed to recall your first file.

Press **F9**
W
B

to go back to your first file. You can use **F9 W B** to switch between windows.

Find the text in the second window that you wish to copy and mark it as a block (using **F7** and **F7**, or **F7** and **Shift+F7** if the text is in a column). Use **F9 W B** to return to your first window, place the cursor at the place you want the copied block to appear.

Press **F10**
C
1

Enable will now display:

Accept Options	Change Options
	What: Block From: This Window

Select Change Options < >, select Block < >, select Other Window < >.

Enable will display a Window Summary Options screen. Select the number of the screen you wish to copy from, press that number and that window will appear showing the highlighted block.

Press **Alt+F5**

The block will be copied to your first window.

Remember to save your file.

To close the second window:
Use **F9 W B** to return to the second window,

Press **F9**
W
C

Enable will close that window and return you to your first file.

Deleting

Deleting may be done quickly on single characters, words, sections of text.

- To delete a single space:

  Press **Del** or Backspace (**BkSp**)

- To delete words:

  Position the cursor on the word you wish to delete,
  Press **F4**

By holding down the **F4** key you can delete many words quickly.

• To delete lines:

Position the cursor on the line you want to delete, press **Alt+F3.**

To delete sections of text:

• To delete everything from the cursor to the top of the screen:

Press **F9**
Del
Home

• To delete everything from the cursor to the end of the screen:

Press **F9**
Del
End

• To delete everything from the cursor to the top of the file:

Press **F9**
Del
Ctrl+Home

• To delete everything from the cursor to the end of the file:

Press **F9**
Del
Ctrl+End

• To delete everything from the cursor to the end of the sentence:

Press **F9**
Del
S

• To delete everything from the cursor to the end of the paragraph:

Press **F9**
Del
P

Restoring Text

Text may be recovered immediately after being deleted by using the following commands:

- To restore the last deleted piece of text,

Press **F9**

U

This will restore the text where the cursor is resting.

- To restore a line that was deleted using the **Alt+F3** command, press **Esc.**

Finding and Replacing Text

If you wish to replace one word with another word in your text, it may be made easier by using Enable's find and replace feature. If, for example, you wish to replace the word assessment with the word evaluation,

Press **F9**

F

R

Enable then asks you to type in the string of letters you wish to find:

Enter String to Find:

You are then asked to type in the string of letters that you wish to replace them with:

Enter Replace String:

NOTE: When using computers you will find that any list of characters or symbols are referred to as a string.

You will then be asked if you wish to accept or change the options:

Accept Options	Change Options
	Case: Ignore From: Current To: Bottom Col: All

If you select Accept Options the search will ignore whether the text has upper or lower case letters and search for any instance of the text. It will begin to search from the current position of the cursor and will search to the bottom of the document, searching for the text in all columns of the text.

If you select Change Options you will be asked to make the following choices:

Case: Ignore	(The computer will search for any instance of the word regardless of how it is typed - upper or lower case.)
As entered	(Type exactly the text you are looking for.)
From: Top	(Search will begin at top of document.)
and To: Current	(If From - search begins at cursor. If To - search ends at cursor.)
Bottom	(Search will end at the bottom of the document.)
Cols:	(Type all, or the starting and ending column numbers for your search.)

Enable has a default feature on the find and replace option that only changes the first occurance of the word you wish to change. In order to continue the find and replace option, press **F6.**

Then press **F6** for each progressive word replacement. If you wish to find the word before you replace it, press **F5.** Then, if you wish to replace it once you have found it, press **F6.**

Draft and Final Form

Draft form is the name given to the form of the document as you type in the text and make various adjustments and additions. Final form is the name given to the document as it will appear when printed. It often helps to change your document from draft to final form, as this will permit you to see the exact layout of the document before you print it.

- To change the document to final form:

Press **F9**

O

D

- To change the document back to draft form, again:

Press **F9**

O

D

You can move between these two forms at will, the only thing that will happen is that page breaks will appear in your draft document.

The status line indicates whether the document on the screen is in draft or final form. When the document is in final form, a line of x's will be displayed on the side of the screen to show where you cannot enter text. These represent the top and bottom margins of the printed document

Inserting a page break

When viewing your document in final form you may decide that you are not happy with the places that Enable assigns as page breaks. (Page breaks occur exactly between pages, and indicate what will appear on each printed page.)

You can define your own page breaks for a file. This can be done in either draft or final form - so you may define page breaks as you review your document just before printing. Place the cursor where you want the page break to occur:

Press **F10**

L

4

< >

This process will add a user defined page break to your document. The user defined page break can be removed by placing the cursor on the page break line and pressing **ALT+F3**. This can only be done in the draft mode.

Saving files under a different Filename

To save a file under a different filename (changing the filename):

1 - Press **F10**
2 - Select Save by typing **S**
3 - Use the arrow key to select **Change** and press **< >**
4 - Select **ENABLE** by pressing **< >**
5 - Select **ENTIRE FILE** by pressing **< >**
6 - Select **NEW NAME**
7 - Type in the new name (including a drive specification if the file is to be saved to a different drive than the one currently in use) and press **< >**. (The extension .wpf will be added automatically unless you specify a different extension)
8 - Select **EDIT** to continue working on the Sample file

Printing Files

Check that the printer is on and has paper, then press **Alt+F2**. This will print using the settings already in the printer command. Changes to certain aspects of the appearance of the printout (font type, margins, etc.) may be done from withinin the **Print** subsection of the Top Line Menu (or in some cases from within the file itself.)

Advanced Features

Text Enhancement using Enable's Attributes

To enhance the appearance of your finished document you may choose from a series of text attributes (underlining, bold, etc). To view the range of available text attributes:

Press **F10**
E
E

To turn off the display, again:

Press **F10**
E
E

You can use attributes either when you are entering text or while revising or editing a file. The status line will display the attribute(s) currently being used.

Attribute selection commands:

Bold text	**Alt+B**
Underlined text	**Alt+U**
Compressed printing	**Alt+C**
Wide printing	**Alt+W**
Changing lower case to upper case	**Alt+F**
Changing upper case to lower case	**Alt+K**
To remove attributes (text Normal)	**Alt+N**

Attributes may be used together, for example to have bold, underlined, text that is wide printed, press **Alt+B**, then **Alt+U**, then **Alt+W** or, hold down the **Alt** key and then press **B** then **U** then **W**.

Attribute use commands:

To apply attribute to a character	**Ctrl+C**
To apply attribute to a word	**Ctrl+W**
To apply attribute to a line	**Ctrl+L**
To apply attribute to a sentence	**Ctrl+S**
To apply attribute to a paragraph	**Ctrl+P**

To use Enable's attributes:

1 - Position the cursor on the character where you want the attribute to begin.
2 - Use an attribute selection command to set the attributes you require.
3 - Press the attribute use command you want.
4 - Turn off the attribute by repeating the attribute selection command used in 2 above.

Line Spacing

Under normal (default) conditions Enable will print a document single spaced. However, there are times when you will want to change the spacing on either part or all of a document. Position the cursor at the point in the document at which you would iike to change the spacing:

Press **F9**
Ins
(n) (spacing number)
S

For (n), type 2 if you want double spacing, 3 if you want triple spacing, and so on.

NOTE: Setting the line spacing in a document will cause the spacing to change throughout the remainder of the document. If you want to change back to single spacing (or to any other spacing) repeat the F9 Ins (n) S command at the point in the document at which you wish to change the spacing.

Setting New Margins

If you are already working in a document and wish to change the margins (set a new ruler),

Press **Alt+F6.**

A new ruler line will be displayed, adjust the margins and tabs to your specifications (see setting a ruler in Section 3 A) press < > when finished.

The Enable Calculator

The Enable calculator will permit you to perform calculations in two ways:

1. Across the page - in this mode your mathematical expression will be replaced with the answer when the calculation is performed. The process involves using your line of text as a spreadsheet cell. You can add, subtract, divide, multiply, and

raise a number to a power. You must the use the following symbols:

+ add
- subtract
* multiply
/ divide
( ) enclose an expression
** raise to a power

You must not leave a blank space anywhere in the calculation. Type the expression to be calulated, then place the cursor in the space immediately after your last character and press:

F9 +

Example: (54*18)+(564-76/897)**2

Place the cursor immediately after the 2 and press **F9 +** . The expression will disappear and be replaced with the answer (**318,972.44**) correct to 2 decimal places.

2. Down the page (by the column) - in this mode the column of figures remains when the calculation is performed. Only addition and subtraction can be performed. Type your numbers in a column, any that are to be subtracted must be preceded by a minus sign (-).
   Mark the entire column as a block, position the cursor under the block:

   Press **F9**
   M
   +

   The column will remain, and the answer will be displayed on the last line.

   Example:

   459
   -98
   97
   -987
   4321
   1876

Mark the entire column as a block (place the cursor to the right of the 4 in 459, press **F7**. Move the cursor under the 6 in 1876, press **Shift+F7**. The column will be highlighted. Move the cursor under the 1 in 1876 and press **F9 M +**. The answer (**5,688.00**) will be displayed under the column.

Checking Spelling - Spell/Check

To utilize Enable's Spell/Check:

1 - Press **F10** (top-line menu)

2 - Select **2** (Spell)

You will be asked:

Accept Options	**Change Options**
	Double Words: Yes
	Scan From: Top

The Double Words option permits you to ask the computer to indicate when you have typed the same word twice sequentially.

Check Double Words: Yes No

The other option, **Scan From**, asks where you would like the spell check to begin.

Scan From: Top Current

Select Current if you want the spell check to begin at the cursor. Select Top if you want the spell check to begin at the cursor. The default spell check is from the top of the document to the bottom.

Once you have selected the options you require, the spell check begins to verify your spelling. When a word is identified that Enable does not recognize, the Word-Not-Found menu is shown under the suspect word:

Word-Not-Found - Albanny

0. Enter Replacement
1. Choose Replacement
2. Ignore Word-Not-Found
3. Add - Lower Case
4. Add - As Entered
5. Add - Retyped Word
6. Exit Enable/Check

Word-Not-Found Options:

Enter a Replacement: (Option 0)

Selecting this option permits you to enter a word or string up to 35 characters in length. Pressing < > causes Enable to replace the Word-Not-Found with the typed string and to continue scanning for the next Word-Not-Found.

Choose Replacement: (Option 1)

Selecting this option tells Enable to list up to four possible spellings for the Word-Not-Found. If you wish to select one of the words Enable offers as the replace ment for the Word-Not-Found type the number corresponding to that word. If the word you want is not there type **Esc** to return to the Word-Not-Found menu, or **0** to enter your own replacement.

Ignore Word-Not-Found: (Option 2)

Selecting this option instructs Enable to ignore the Word-Not-Found and to continue scanning the text.

Adding Words-Not-Found to the User Created Dictionary:

Selecting any of these options instructs Enable to add the Word-Not-Found to the user created dictionary. You may add the Word-Not-Found in either (using Options 3,4, and 5):
Lower Case - Option 3
As Entered - Option 4
Retyped Word - Option 5
If you select Option 5 Enable asks:

Should Word-Not-Found be Replaced with Retyped Word.

Select either yes or no.

Exiting Spell/Check: (Option 6) — Selecting this option instructs Enable to stop the spell/check and return you to your document. A summary screen will be displayed, press Esc and Enable returns to the document.

The **Word Duplication Option.** If Enable meets a word that occurs twice in succession in the text the following will be displayed on the screen:

Word Duplication - Yemen
1. Delete Duplication
2. Ignore Error
3. Exit Enable/Check

Delete Duplication: — Selecting this option will cause Enable to delete the duplication leaving the word to occur only once at that place in the text.

Ignore Error: — This option instructs Enable to ignore the duplication and continue the spell/check.

Exiting Spell/Check: — Selecting this option instructs Enable to stop the spell/check and returns you to your document. A summary screen will be displayed, press Esc and Enable returns to the document.

Expert Command Listing

Remember that commands listed as **Ctrl+S** require that the two keys listed be pressed simultaneously.

Commands listed as **F9 O C B** require that the keys listed be pressed sequentially.

Remember, the command **< >** represents the Enter key.

< >	Closes a paragraph or section of text
Ctrl+< >	Creates a paragraph at the cursor
Esc	Restore the last deleted line (at the cursor)

Function Keys

F1	Displays the help screen
F2	Used in cursor control (with other keys)
F3	Inserts a line above the cursor
F4	Deletes a word at the cursor
F5	Repeat current text find activity
F6	Repeat current text find and replace activity
F7	Marks a block of text
F8	Copy block
F9	Used in expert commands (with other keys)
F10	Displays the Top Line Menu
Alt+F1	Displays function key chart
Alt+F2	Prints the file
Alt+F3	Deletes a line at the cursor
Alt+F4	Centers the text on that line
Alt+F5	Copy block from another window
Alt+F6	Insert a ruler (above the cursor)
Alt+F7	Deletes block markers
Alt+F8	Move block
Alt+F10 < >	Save

Calculator

F9 +	Calculate expression
F9 M +	Calculate columnar expression

Draft and Final Form

F9 OD	Draft Form - Final Form ON/OFF

Inserting a Page Break

F10 L 4 < >	Inserts a page break at the cursor

Changing the Line Spacing

F9 Ins (n) S	Changes line spacing to the number (n) specified

Finding Text

F9 F T	Find text
F9 F M	Find and mark text
F9 F R	Find and replace text

Deleting

F9 Del B	Delete marked block
F9 Del < >	Delete paragraph marker
F9 Del P	Delete from cursor to end of paragraph
F9 Del End	Delete from curser to end of screen
F9 Del Home	Delete from cursor to top of screen
F9 Del S	Delete from cursor to end of sentence
F9 U	Undo last delete (replaces text at the cursor)

Attributes

Alt+B	Bold text
Alt+U	Underlined text
Alt+C	Compressed printing
Alt+W	Wide printing
Alt+F	Changing lower case to upper case
Alt+K	Changing upper case to lower case

Attributes may be used together, for example to have bold, underlined, text that is wide printed, press **Alt+B**, then **Alt+U**, then **Alt+W**, or, hold down the **Alt** key and then press **B** then **U** then **W**.

Attribute Use Commands

Ctrl+C	To apply attribute to a character
Ctrl+W	To apply attribute to a word
Ctrl+L	To apply attribute to a line
Ctrl+S	To apply attribute to a sentence
Ctrl+P	To apply attribute to a paragraph

Special Characters

F9 O C B	Characters to draw boxes
F9 O C O	Turns off special characters

Exercises

Text of Sample.wpf

MOCSAR - FULL PUBLIC SECTOR SURVEY

PROPOSED SURVEY DATES: JUNE - SEPTEMBER 1989

Element 1: Activity Planning

The formation of the MOCSAR survey team (most probably the six MOCSAR/IEES counterparts, Saeed Nasher and Ali Saeed Kaid) and setting of survey schedule and internal MOCSAR supervisory structure.

The modification of MOCSAR/IEES documents ("pre-final" survey instruments and code book) as necessary.

The development of training materials.

Document finalization; printing distribution, etc.

Element 2: Field Staff Training

The training of some 200 field staff and data coders, to be completed as a series of two to three day workshops given by MOCSAR/IEES counterparts with assistance from the consultants.

Element 3: Survey

To be conducted entirely by Yemenis, consultant assistance will concentrate on data integrity concerns and trouble shooting.

Element 4: Data Coding and Entry

Possibility/probability exists that CPO may enter all data once coded by MOCSAR. Consultants will oversee process and establish and implement quality control procedures.

Element 5: Data Analysis

To be conducted at MOCSAR by MOCSAR/IEES counterparts with assistance from the IEES team.

Element 6: Report Preparation

To be conducted at MOCSAR by MOCSAR/IEES counterparts with assistance from the consultant team.

Exercise 1 - Revising, Editing, Saving, Printing, and Quitting a File

1 - Access ENABLE by typing **EN** at the C: prompt
2 - View the next screen, follow the instructions at the bottom of the screen. Press End to get the Main Menu
3 - Using the arrow keys select: **Use System**
Word Processing
Revise
4 - Type in the name of the file **A:Sample.wpf**
5 - Press **< >**
6 - Read through the text
7 - In the section Element 1 replace the word **formation** with **preparation**
8 - Insert **a** between of and survey
9 - Delete the sentence **The development of training materials** and replace it with **A comprehensive set of training materials will be** developed at this time.
10 - Set the section that begins **Element 5** and ends with **IEES team** as a block and move it to the end of the document. Change the numbers of Elements 5 and 6. Insert any lines or spaces that are necessary to improve the look of the document.
11 - Save the file
12 - Save the file again under the new name **A:test1.wpf**
13 - Print the file
14 - Quit the file

Exercise 2 - Using the Text Attribute Options and Changing Margins

1 - Retrieve the working file test1.wpf
2 - Set Enable for bold text (**Alt+B**)
3 - Change each title Element 1, Element 2, etc., to bold
4 - Remove the bold text option and replace it with the underline option, and underline the Element titles
5 - Change the title of the file so that it is both bold and underlined
6 - Print the file
7 - Remove all attributes from the text
8 - Put a blank line between each Element
9 - Using the Move Block command reverse the order of the Elements. (That is, change them so they begin with Element 1 and end with Element 6.)
10 - Go to the top of the page and insert a ruler (**Alt+F6**), setting the left margin at 4, tabs at 15 and 25 and the right margin at 65, press **< >** to reformat the document to that ruler.
11 - Center the titles, and change them to bold print
12 - Center the Element titles (Element 1, 2 , 3, etc.) and underline them.
13 - Go to the blank line between Element 2 and 1, insert a ruler, setting the left margin at 15 and the right at 50, press **< >**
14 - Print the file
15 - Quit the file and return to DOS

Exercise 3 - Creating and Editing a Short Budget

1 - Access Enable and create a file **test2.wpf**

2 - Set the margins at **5** and **65**, with a tab at **33**

3 - Type the following:

SLEC Botswana - Proposed Budget

October 1988 - February 1989

1. Country Team Leader*	5 mths. @ $495	$ 2,475
2. Research Associate*	3 mths. @ $440	1,320
3. Secretary	5 mths. @ $200	1,000
4. CTL and RA Taxi		250
5. Computer Time at UB		250
6. Software		800
7. Misc. Supplies		300
8. Reports, drafts, Seminar papers, etc.		500
9. DHL	5 @ $50	250
10. Telex	10 @ $30	300
11. Telephone, Mail		350

4 - Use the Enable calculator to total the dollars and print the file

5 - Change the document to look like the following (use the text attribute and block commands):

Botswana Survey - Proposed Budget

October 1988 - February 1989

Personnel		
Country Team Leader*	5 mths. @ $495	$ 2,475
Research Associate*	3 mths. @ $440	1,320
Secretary	5 mths. @ $200	1,000
Travel		
Taxi		250
Supplies		
Misc. Supplies		300
Photocopying		
Reports, drafts, Seminar papers, etc.		500
Communication		
DHL	5 @ $50	250
Telex	10 @ $30	300
Telephone, Mail		350
Data Processing Costs		
Computer Time at UB		250
Software		800
	TOTAL	

6 - Save the file
7 - Print the file
8 - Return to DOS

18

Exercise 4 - Copying

1 - Access Enable and retrieve test2.wpf
2 - Insert a line at the top of the file and type in the top left hand corner of the document:

Proposition 1

3 - Set the entire document as a block and copy it underneath itself
4 - Call the second budget (the one you have just created),

Proposition 2

5 - Use the Enable calculator to double all costs except Personnel and communication
6 - Calculate a new total
7 - Create a new file by opening a new window, call the new file **test3.wpf**
8 - Set the margins at 5 and 65
9 - Copy the proposition 2 budget to the new file
10 - Save the file test3.wpf and then print it
11 - Quit the file
12 - Save the file test2.wpf and then print it
13 - Quit Enable

SPSS/PC+

SPSS/PC+ REVIEW

Introduction

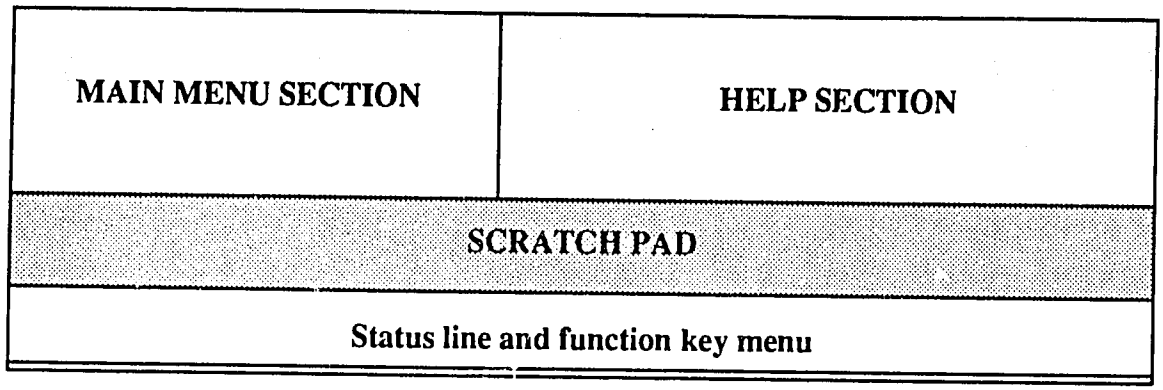
SPSS/PC+ is a program for the analysis of data gathered in social science research. SPSS stands for "Statistical Package for the Social Sciences." This section is not intended as a short course on the use of SPSS/PC+, but rather as an overview and reminder for those who have some knowledge of the package.

SPSS is a program originally developed for mainframe computers, and is based on a special language designed to ease the work of analysis, offer many options, and to use a series of consistant commands and procedures which are useful over many different analyses and studies. The current version designed for the PC maintains the features of the mainframe program, adding new features and adaptations to the PC.

SPSS/PC+™ Ver. 2.0 has three main components: (1) shell, (2) data entry and processing, and (3) analysis/reporting. The **shell** is what the user sees and uses to do the other tasks. It consists of menus and special key combinations to accomplish the tasks of the other two parts. The **data entry** and **processing** section has programs to help key the data into the computer files, check and clean the data, rearrange the data, and change it where desired. The **analysis** section contains programs for answering analytical questions about the data (such as, "What is the average age of the employees in each agency?," "Is there a relationship between the years of service and salary of an employee?," etc.). There is also a section for translating data files to be read into SPSS/PC+™ Ver. 2.0 from other programs or moved from SPSS/PC+™ Ver. 2.0 to other programs. Results of analyses and reports may also be moved into most word processing programs.

Using the Program

The shell presents information in **windows**. A window is a portion of the contents of the computers memory (RAM) which is displayed on the screen. SPSS/PC+™ Ver. 2.0 uses two windows, with one of the windows divided into two sections. When the SPSS/PC+™ program begins, it normally starts in REVIEW mode, with the Main Menu and windows displayed. The screen is divided into three sections roughly as shown here:



• The top window, in the top half of the screen, contains the menus and related information.

• The bottom window, in the bottom half of the screen, contains the work in progress and/or the results; it is called the SCRATCH PAD.

• The status line/function key menu displays information about the current task or choices available when function keys are pressed; for example, when the F1 Help key is pressed, the Help options appear on the bottom line menu.

• The top window may be made smaller to allow more of the current work in progress to show and be worked on, or the menu window (top half) may be turned off (Alt/M key combination).

The user may do desired tasks by making choices from the menus. Choosing a command from the menu writes that command into the SCRATCH PAD; choosing options from commands writes the options into the SCRATCH PAD also, in the correct order for the SPSS/PC+ program to execute.

Running the program is therefore a matter of:

1. Using the menus to find the desired command.

2. Pasting the desired command into the SCRATCH PAD by choosing the option from the menu.

3. Executing the commands from the SCRATCH PAD by pressing F10

and ENTER to run the commands from the cursor down.

4. Viewing the results on the screen, and modifying or adding to the commands as desired.

Move through the menus by highlighting the choice and hitting the < > ([ENTER]) key. Proceed through the levels until the desired choice is found. You may move backward through the menu structure with the Esc key.

5. The results of the choices are displayed in the bottom window or SCRATCH PAD.

The user (you) causes SPSS/PC+™ Ver. 2.0 to do the desired work by having the program execute commands in a special coded language. These written commands are referred to as the "code" which the computer understands. This code is a special language which the user must learn in order to use SPSS/PC+™ Ver. 2.0.

The **Shell** helps the user to choose and write the correct code by using the menus.

There are four general kinds of code, or SPSS/PC+™ Ver. 2.0 commands. Each code has a title, which simply tells the person reading the code what it is about. The title section of the code does not do anything besides give a heading to the file.

- The data definition and identification code. These commands tell the program where to find the data, what the data mean, and how they are to be labelled in any printing of results.

- The data processing, reorganizing, changing codes or commands. These commands tell the program how to order the data, divide it into sections, change or recode values, or produce lists and records of the contents of the data.

- The analysis commands. These commands tell the program what analyses you want done, cause the analysis to be performed and results to be printed and/or shown on the screen. The analysis commands include many options about the way the analyses are to be performed, how the results are to be presented, and other details of reporting. The options for each analysis differ and will be discussed in detail in the section on each analysis command.

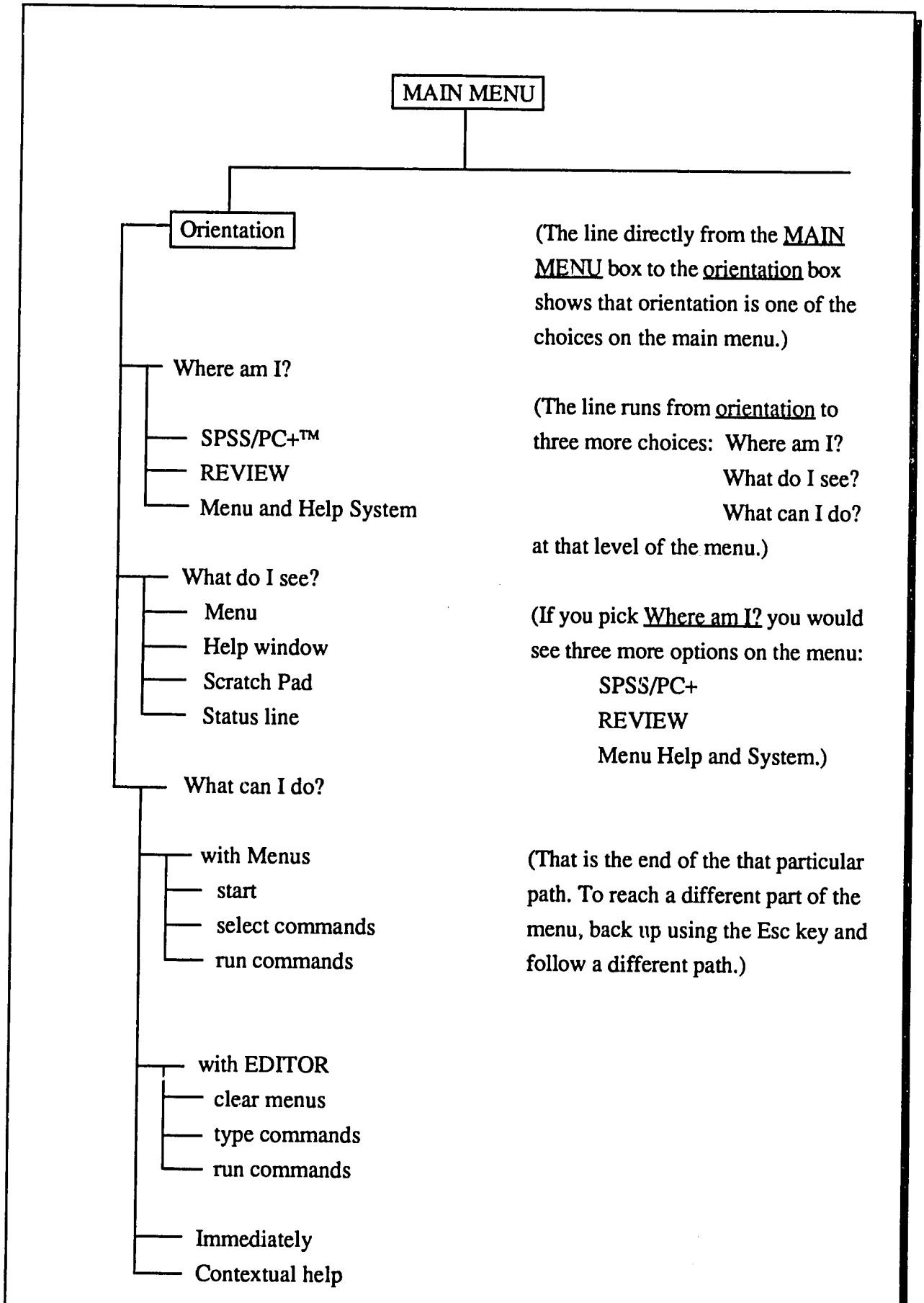
- The session control commands are special commands which determine the various options on the particular PC in use and peripherals such as printers, display, etc.

Menu System

SPSS/PC+ provides a system of menus to help you perform all the program tasks. You may also use what we will call Command Mode to execute SPSS/PC+ commands directly without using the menus. Using Command Mode is somewhat faster for someone who is thoroughly familiar with the program and commands. For the beginner, however, it is usually better to use the menus.

The SPSS/PC+ program normally begins in REVIEW mode, with the main menu displayed. To move into Command Mode you press **F10** and choose the Exit to Prompt option. From that choice, the program displays the SPSS/PC+ prompt and simply waits for a command. To use the menus, you choose one of the options from the main menu and proceed.

In order to use the menus effectively, you must become familiar with the arrangement of options available and how to use them. The menu maps below show the arrangement of options in a kind of map. The lines on the map show what options are available at any particular point in the menus, and how to move from that point to any other part of the menus.
For example, examine the part of the menu map below:



(The line directly from the MAIN MENU box to the orientation box shows that orientation is one of the choices on the main menu.)

(The line runs from orientation to three more choices: Where am I?
What do I see?
What can I do?
at that level of the menu.)

(If you pick Where am I? you would see three more options on the menu:
SPSS/PC+
REVIEW
Menu Help and System.)

(That is the end of the that particular path. To reach a different part of the menu, back up using the Esc key and follow a different path.)

In this way the map shows you the series of menu choices you must make to reach any particular part of the menu and execute any part of the program. To view the part of the orientation dealing with REVIEW, you would proceed as follows:

1. From the MAIN MENU, choose Orientation.
2. From the orientation menu, choose Where am I?
3. From the Where am I? menu, choose REVIEW.

Data and Data Entry

There are essentially three distinct types of data which one encounters in social science research. The first type is numeric data. **Numeric** data is not any data that has a number or numbers involved with it. Our definition of numeric data is restricted to that data which are in either integer, decimal, or scientific notation in which the number has a true meaning. The second type of data is known as **string** (or text) data. This type is simply data which are consisting of words, phrases, and so on. The final type of data we group into a category called **special**. These data are phone numbers, dates, currency, etc. These data, although often consisting of numbers, the numbers may or may not have relevance in and of themselves as an interval scale. (For example, a phone number of 02-34581 is not a greater phone number than a phone number of 02-14431.)

It is important to make clear the distinction between variable definition and measurement. A variable definition is a choice of some observable characteristic of a thing (person, event, object, etc.) which stands for a concept. A measurement is making and recording an observation on one or more of the the unit(s) of observation chosen. The unit of observation is the thing (entity, object, person, event, activity, etc.) which is the focus of attention in an observation. It is defined by the researcher/analyst.

The unit of analysis is the thing (as above) about which the research questions are formed and is the focus of attention in the analysis. The unit of observation and unit of analysis are often the same, but this is not necessarily so (for example: activities v. jobs v. offices v. departments).

SPSS/PC+™ Ver. 2.0 defines the unit of observation and/or analysis as a **case**. The unit of observation in the Pilot Study is the individual employee. Therefore the case is the

collection of information about each individual. There are 1801 cases in the file.

The file consists of all the cases which contain the same kinds of information about the unit of observation (in this study, the employee). There may be more than one file in a study, depending on how the analyst wants to organize the data.

Defining Data in SPSS/PC+

Example from the Data Dictionary for Pilot Study:

Variable: Y1 Label: NAME OF WORK PLACE
Value labels follow Type: Number Width: 2 Dec: 0
Missing: 99.00

22.00	CUSTOMS AUTHORITY	27.00	TEXTILE FACTORY
42.00	MINISTRY-ROADS,BLDGS	51.00	AL-THAWRA HOSPITAL
59.00	MINISTRY OF TRANSPOR	77.00	CARE-MARTYRS FAMILY
99.00	ALL OTHER RECORDS		

The DATA LIST command is used to identify variable name, type, and width. The DATA LIST command follows this general structure:

DATA LIST [FILE='filename'] [FIXED] [TABLE] / varlist columns [{(0)}]
{(n)}
{(A)}

How to read the symbols in a command specification:

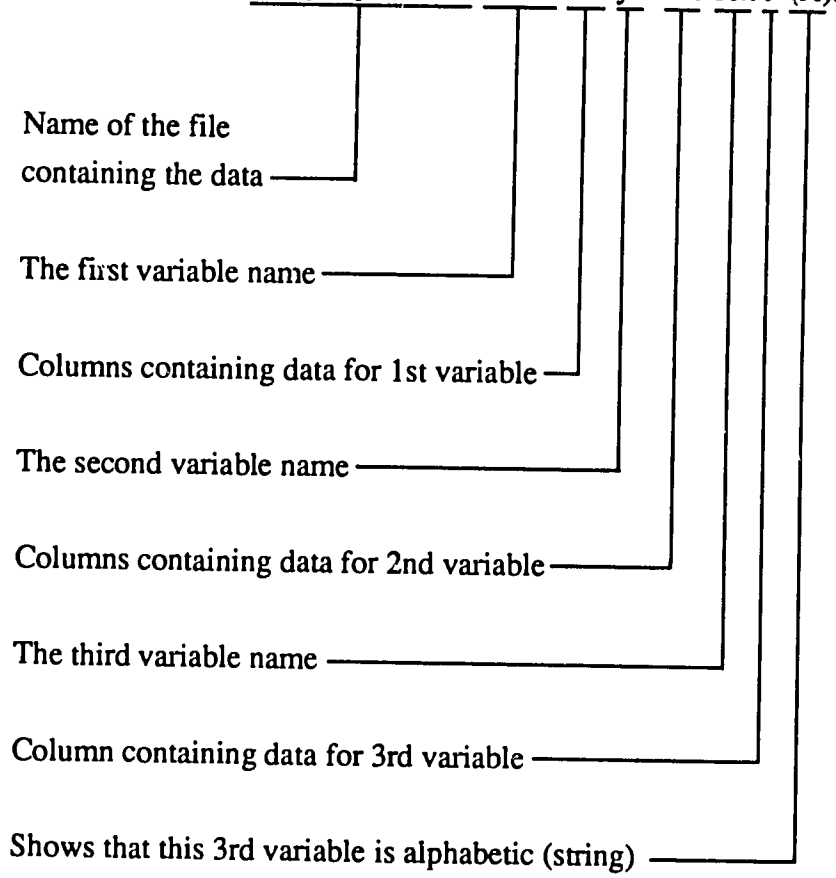
[ ] square brackets contain optional parts of the command.

{ } braces show alternative entries or specifications; one of the alternatives must be entered to complete the specification correctly.

UPPER CASE (capital letters): part of the command that must be entered as shown.
lower case: information supplied by the user, which will probably differ for each variable or case.

For example:

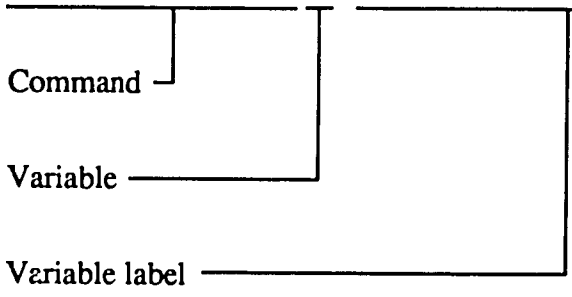
DATA LIST FILE='c:\spss\pilot.dat' /index 1-5 y2 6-8 sex 9 (A).



A number in parentheses following the column location is used to indicate the implied number of digits to the right of the decimal for numeric data. A value of 0 is the default (program-supplied value if none is specified). A decimal point in the data overrides the specification in the DATA LIST command.

Identifying variable labels and values is done in a similar manner, using the VARIABLE LABELS command. This attaches a string to the output (generated when the program runs) which describes the short variable name used for the SPSS program in a more thorough and meaningful manner. For example:

```
VARIABLE LABELS Y2 'Public Admin. Dept. or Bureau'.
```

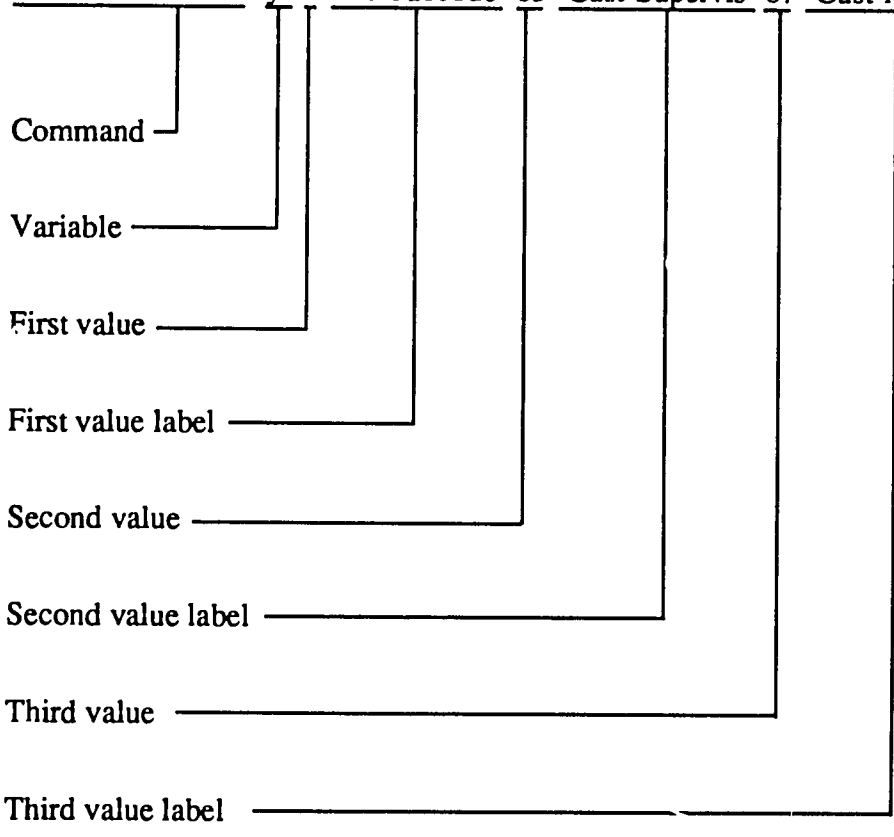


When the program runs, the string "Public Admin. Dept. or Bureau" will be printed whenever the Y2 variable is printed.

Similarly, the VALUE LABELS Command is used to add a string to the printed output for each specified value of the variable or variables desired.

Example:

```
VALUE LABELS y2 0 'No Subcode' 85 'Cust-Supervis' 87 'Cust-Admin'.
```



This structure continues for as many values as are needed for this variable. A "/" is used to separate variables. In the example above, for the value of "85," the string "Cust-Super-vis" will be printed whenever "85" is printed in conjunction with the variable, Y2.

Exercise 1: Write out the SPSS/PC+ Ver. 2.0 code for new DATA LIST, VARIABLE LABELS, and RECODE statements for two variables from the pilot study. Pilot study data and information are below.

Exercise 2: Write out an explanation of this statement:

```
DATA LIST FILE='\data\survey1.dat' /name 1-30 (A) age 31-32 income 33-39
    rate 40-44 (2) position 45-46.
```

Pilot Study Variable List

Variable Name	Variable Label	Variable Name	Variable Label
Index	- Index Number	Y1	- Name of Work Place
Y2	- Public Administration DE	Y3	- Original Ministry of Wor
Y4	- Employment Governate	Y5	- Sex
Y6	- Age in Years	Y7	- Nationality
Y8	- Highest Level of Education	Y9	- Year Highest Qualification
Y10	- Area of Specialization	Y11	- Country of Study if Univ
Y12	- Length of Study in Years	Y13	- Attended Work Related Co
Y14	- Subject of Last Course # 1	Y15	- Subject of Last Course # 1
Y16	- Date of Last Course #1	Y17	- Date of Last Course #2
Y18	- Duration of Last Course	Y19	- Duration of Last Course
Y20	- Occupation Status	Y21	- Current Grade
Y22	- Occupation Grade	Y23	- Occupation Nature
Y24	- Year Entered Yemeni Gove	Y25	- Number of Years in Curre
Y26	- Basic Monthly Salary - Y	Y27	- Total Monthly Salary - Y

Defining and Entering Data

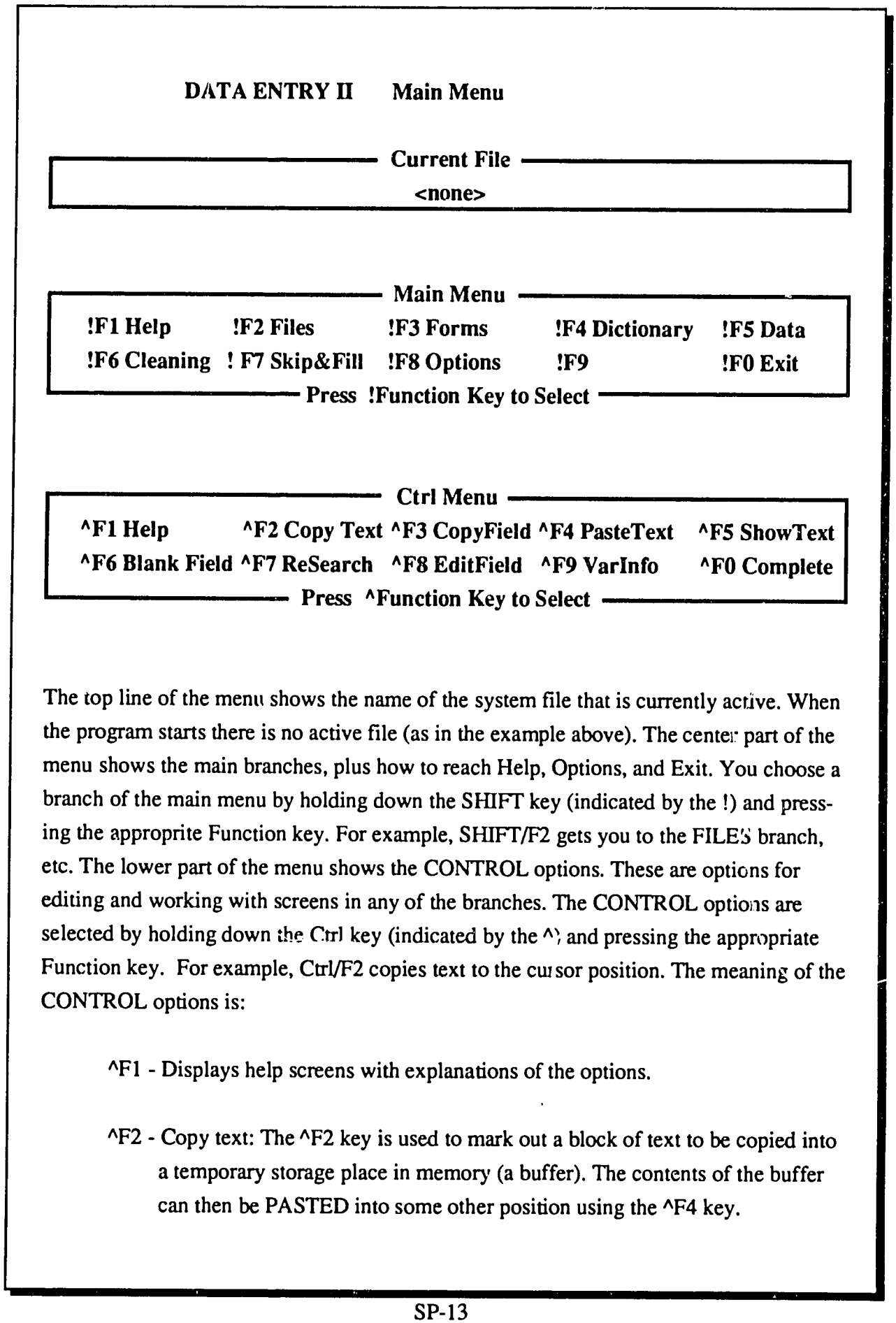
The commands listed in the previous section (DATA LIST, VARIABLE LABELS, VALUE LABELS) are used when the data set to be used already exists in raw form. When building a new data set, the DATA ENTRY II section of the program should normally be used. DATA ENTRY II provides a fast and easy way to define the data dictionary, input the data, and clean the data set.

DATA ENTRY II Menus

The DATA ENTRY II program consists of 6 parts or branches:

1. Dictionary branch for defining the names and characteristics of variables.
2. Forms branch for designing custom input forms.
3. Data branch for entering data.
4. Files branch for reading and writing files.
5. Cleaning branch for cleaning the data.
6. Skip and Fill branch for automating data entry.

When the D+ program starts, it displays the main menu which looks like this:



The top line of the menu shows the name of the system file that is currently active. When the program starts there is no active file (as in the example above). The center part of the menu shows the main branches, plus how to reach Help, Options, and Exit. You choose a branch of the main menu by holding down the SHIFT key (indicated by the !) and pressing the approprite Function key. For example, SHIFT/F2 gets you to the FILES branch, etc. The lower part of the menu shows the CONTROL options. These are options for editing and working with screens in any of the branches. The CONTROL options are selected by holding down the Ctrl key (indicated by the ^) and pressing the appropriate Function key. For example, Ctrl/F2 copies text to the cursor position. The meaning of the CONTROL options is:

^F1 - Displays help screens with explanations of the options.

^F2 - Copy text: The ^F2 key is used to mark out a block of text to be copied into a temporary storage place in memory (a buffer). The contents of the buffer can then be PASTED into some other position using the ^F4 key.

To mark a block of text, move the cursor to the beginning of the block and press ^F2; a block of reverse video (light letters on a dark background) appears at the cursor. Then move the cursor to the end of the block; as you do so the reverse video marks the block. Press ^F2 at the end of the block, copying the text into the buffer for placement later.

^F3 - Copy Field: has the same effect as ^F2, except it works on an input or editing field. Place the cursor anywhere in the field and press ^F3 and the field will be copied into the buffer.

^F4 - Paste Text: copies the contents of the buffer onto the screen beginning at the position of the cursor.

^F5 - Show Text: displays the contents of the buffer in a small window on screen. The window is removed by hitting the SPACE bar.

^F6 - Blank Field: replaces the contents of the field at the cursor with blanks.

^F7 - ReSearch: searches for the same characters in a menu option that were searched for previously.

^F8 - Edit Field: allows editing of individual characters in a highlighted field. If you start typing new characters in a highlighed data field, the field will be blanked and the new characters will replace the old. If you press ^F8 first, a cursor appears in the field allowing you to move about and change any individual characters.

^F9 - Var Info: displays information about the variables in the active file.

^F10 -Complete: completes the activity or function in progress.

The Control Options are available in all Branches of Data Entry II.

DATA ENTRY II File set up

The DATA ENTRY II section of the SPSS/PC+™ program can be used to define a new data set. This is the correct procedure to use to do this, with a few cases as examples.

1. From the SPSS/PC+ main menu choose **read and write files.**

2. From the read and write files menu choose DE (for DATA ENTRY II). DE will then appear in the bottom window. Press **F10** to get the run from cursor option on the bottom line, then press < >. This will run the DATA ENTRY II program and present the DATA ENTRY II main menu.

3. There are four main steps in creating a new data set using DATA ENTRY II: (a) create a new file, (b) create a dictionary containing the variable names, labels, and values, (c) enter the data, and (d) check and clean the data. The data may then be used directly in any desired analyses and also transferred to other programs for processing.

3 a. Choose **F2** from the Main menu to go to the FILES branch. This brings up the FILES menu which looks like this:

FILES Branch Menu (F2)

Main Menu

!F1 Help	**!F2 Files**	**!F3 Forms**	**!F4 Dictionary**	**!F5 Data**
!F6 Cleaning	**!F7 Skip&Fill**	**!F8 Options**	**!F9**	**!F0 Exit**

Press !Function Key to Select

Get/Save Files

Help	F1	aF1	Help
Get File	F2	aF2	Make Default Template
Save File	F3	aF3	
Define New File	F4	aF4	Unplace Variable
Copy Dictionary	F5	aF5	Resize Cursor On/Off
Directory of Files	F6	aF6	Edit ASCII Date Template
Read ASCII Data	F7	aF7	Get ASCII Data Template
Write ASCII Data	F8	aF8	Save ASCII Data Template
Delete File	F9	aF9	
	F0	aF0	

Press !Function Key to Select

Ctrl Menu

^F1 Help	**^F2 Copy Text**	**^F3 CopyField**	**^F4 PasteText**	**^F5 ShowText**
^F6 Blank Field	**^F7 ReSearch**	**^F8 EditField**	**^F9 VarInfo**	**^F0 Complete**

Press ^Function Key to Select

From the FILES branch menu choose **F4** Define New File. Then enter the name of the new file. If you are going to use a dictionary from some other file, you then choose **F5** from the FILES branch menu to copy the dictionary from that old file into the new one.

3 b. From Define New File you move to the DICTIONARY branch by pressing **F4**. You can return to the Main Menu first by pressing F1, or move directly to the DICTIONARY branch with F4. The DICTIONARY branch menu looks like this:

DICTIONARY Branch Menu (F4)

Main Menu

!F1 Help	!F2 Files	!F3 Forms	!F4 Dictionary	!F5 Data
!F6 Cleaning	!F7 Skip&Fill	!F8 Options	!F9	!F0 Exit

Press !Function Key to Select

Create/Edit Dictionary

Help	F1	aF1 Help
Define Variable	F2	aF2
Edit Variable	F3	aF3
Copy Variable	F4	aF4
Edit Value Labels	F5	aF5
Copy Value Labels	F6	aF6
	F7	aF7
Set Display Mode (All)	F8	aF8
Delete Variable	F9	aF9
	F0	aF0

Press Function Key to Select

Ctrl Menu

^F1 Help	^F2 Copy Text	^F3 CopyField	^F4 PasteText	^F5 ShowText
^F6 Blank Field	^F7 ReSearch	^F8 EditField	^F9 VarInfo	^F0 Complete

Press ^Function Key to Select

From the DICTIONARY branch menu choose **F2** (Define Variable.) Use the variable names, etc., from the table below to answer the prompts, or you may make up your own data set. After you have defined the first variable, just press **F2** to define another, and so forth until the dictionary is complete.

Variable Name	Variable Label	Width Labels	Type	Value
ID	Identification No.	4	n	
AGE	Age in Years	2	n	
TENURE	Years in Current Pos.	2	n	
RATING	Performance Rating	1	n	1 Excellent
				2 Very Good
				3 Good
				4 Poor
				5 Unacceptable
COMMENT	Rater's Comments	50	A	

When the Dictionary is complete return to FILES branch by pressing **F2** and then choose **F3** (Save File) to save the new file with the completed dictionary.

Entering data

DATA ENTRY II provides two ways to enter data: a spreadsheet format in which there is a blank sheet created with a row for each case and columns for the variables, or a custom-made form with a box for each variable. This discussion describes how to enter data into the spreadsheet. The description of creating a custom form is found below.

When in the Dictionary Branch Menu, move to the DATA branch by pressing **!F5**. The DATA branch menu will appear, which looks like this:

DATA Branch Menu (F5)

```
Main Menu
!F1 Help      !F2 Files     !F3 Forms     !F4 Dictionary !F5 Data
!F6 Cleaning  !F7 Skip&Fill !F8 Options   !F9            !F0 Exit
Press !Function Key to Select
```

```
Enter/Edit Data
                          Help  F1   aF1  Help
                  Delete Case   F2   aF2
            Go to Invalid Case  F3   aF3
           Clean Current Case   F4   aF4
      Search & Replace Value    F5   aF5
           Add Cases On/Off     F6   aF6  Skip&Fill On/Off
                  Go to Case n  F7   aF7
              Go to Variable    F8   aF8
             Display Variable   F9   aF9
            Switch Data View    F0   aF0
Press Function Key to Select
```

```
Ctrl Menu
^F1 Help       ^F2 Copy Text ^F3 CopyField ^F4 PasteText ^F5 ShowText
^F6 Blank Field ^F7 ReSearch ^F8 EditField  ^F9 VarInfo   ^F0 Complete
Press ^Function Key to Select
```

When DATA ENTRY II enters the DATA branch for a new file, it automatically creates a new blank spreadsheet, with the variable names at the top of each column, in the order they were defined. The first column is reserved for a case number, which is supplied automatically by the program as you enter data.

The DATA branch menu appears on top of the spreadsheet. To begin entering data, press the space bar to clear the menu and enter the first value for the first variable in case #1. When you press enter, the cursor will move to the next variable in that case, or from

the last variable in one case to the first variable of the next. Use the arrow keys to move to previous values to make any necessary changes. If you make a frequent or consistent error, the F5 key chooses the Search & Replace Value function, so that a change through many cases may be done in one step.

If you wish to have data checked for correct range or consistency with other variables, you may define Ranges and Rules (as described below) before entering the data. Whenever a correct Range or Rule has been defined for a variable, the program will check each entry and signal when an entry is invalid.

It is also possible to define SKIP & FILL rules (as described below). A SKIP & FILL rule provides for the program to skip to one or more variables and fill in their values depending on the value in some other variable. For example, suppose in an employment survey, there was a different subset of questions for respondents who worked for different agencies of government. A SKIP & FILL rule could be defined so that when the agency variable was entered, the program would skip to the appropriate questions for that agency and mark the questions for all other agencies as MISSING. If SKIP & FILL rules are to be used, they are defined before data entry.

Cleaning the Data

The DATA CLEANING branch works by checking the data for values that are out of range—that is, the wrong value, too high, too low, etc. It also checks for combinations of values that are unlikely or impossible. The program does not change the data, however. It only marks cases as invalid according to the ranges or rules defined by the user. The program can print a list of all invalid cases or allow the user to scan through the cases, examining each invalid one in turn. The user then decides what the correct value should be and makes changes where desired.

To begin cleaning, press **F6** to get to the CLEANING branch menu:

CLEANING Branch Menu (F6)

```
                    Main Menu
!F1 Help      !F2 Files      !F3 Forms     !F4 Dictionary  !F5 Data
!F6 Cleaning  !F7 Skip&Fill  !F8 Options   !F9             !F0 Exit
              Press !Function Key to Select
```

```
                Create/Edit Cleaning Specs
                        Help   F1    aF1  Help
              Define Range/Rule   F2    aF2
                Edit Range/Rule   F3    aF3
                Edit Rule Name    F4    aF4
                    Print Report  F5    aF5
                     Clean File   F6    aF6
                Copy Range/Rule   F7    aF7
              Check Ranges/Rules  F8    aF8
              Delete Range/Rule   F9    aF9
            Switch to Ranges/Rules F0     aF0
              Press Function Key to Select
```

```
                    Ctrl Menu
^F1 Help       ^F2 Copy Text  ^F3 CopyField  ^F4 PasteText  ^F5 ShowText
^F6 Blank Field ^F7 ReSearch  ^F8 EditField  ^F9 VarInfo    ^F0 Complete
              Press ^Function Key to Select
```

Thus, there are three main steps in cleaning the data: (1) defining ranges and rules, (2) doing a cleaning pass on the data, and (3) scanning through the data to make desired changes. Doing a cleaning pass may also include printing a report of the invalid cases.

Defining or editing Ranges or Rules uses the same function keys. F2 defines either one; if you press **F2** and the program prompts for a Range, you can switch to Rules with **F10**, or back to Ranges by pressing F10 again, and so forth.

Defining a range is accomplished by first choosing **F2** from the DATA CLEANING

menu. The range values are written in the workspace using the operators thru and by. The following are all valid ranges for numeric variables:

20 thru 80 (marks as invalid any case whose value is less than 20 or over 80)

10 thru 50, 75 thru 100, 200 thru 500 (marks as invalid any case whose value is less than 10, between 50 and 75, between 100 and 200, or over 500)

0 thru 20 by 2 (marks as invalid any case whose value is an odd number, less than zero, or over 20; that is, only even numbers from 2 to 20 would be valid)

The entry of a range is completed by pressing **^F10.**

For example, a survey of civil service employees should not have respondents 5 years of age, or who have worked for the agency for 87 years, or who have monthly incomes of over 20,000, etc. The analyst decides on what the correct ranges of values should be for the data and enters these as Ranges in DATA ENTRY II.

The analyst may also specify rules for data which make a case invalid or suspicious. For example, a person with a university level education would not be expected to hold a very low level job. Rules can be written to check for these unlikely combinations of values.

To write a Rule choose F2 from the DATA CLEANING menu. Then write the rule as a mathematical or logical expression using the operators shown in the upper window (see p. C-30 through C-32 in the DATA ENTRY II manual for an explanation of the operators and their use). For example:

AGE LE 12 IMPLIES STUDENT = 'T'

The rationale is that if a persons age is 12 or less, we would expect them to be a student. Therefore, for all cases where the variable AGE is less than or equal to (LE) 12, then the value of the variable STUDENT should equal T (for TRUE). If it doesn't, the case is marked invalid.

1988 - YRENTRY LE YRSERV

The respondent cannot have more years of service in a position (YRSERV) than the number of years from entry into service (YRENTRY) to the present (1988). They may have fewer years, due to interruptions, but cannot have more than from year of entry to the present.

To print a report press **F5** in the CLEANING BRANCH menu. The program will prompt you for more information. The program produces three kinds of reports in a cleaning pass:

By Case - lists each invalid case in numerical order showing the range or rule violated.

By Rule/Range - lists each rule or range violated with the number of each invalid case.

List Rules & Ranges - a list of the rules and ranges.

A report may be sent to a file on disk (to be printed later) or directly to the printer. If you wish the report to be printed immediately, type in **PRN** when prompted for a file name. BE SURE THERE IS A PRINTER CONNECTED AND READY TO RUN IF YOU CHOOSE THIS OPTION. If there is not, you may lose the entire SPSS session.

To practice the DATA CLEANING function, decide on three rules for the pilot study data and enter them into the data cleaning branch.

Custom Data Entry Forms

The FORMS BRANCH allows the user to produce a custom form which will appear on the screen for data entry or editing in the DATA BRANCH. When using a form, data are entered or edited one case at a time on the screen. When using the spreadsheet, 20 cases can be viewed at one time. The use of form or spreadsheet does not affect the data, only the display. The form makes entry and editing easier in many applications because it allows for labels of variables and instructions on the screen. For example: a form for

entering name, age, and sex could look like this:

Please fill in the boxes below:

NAME: _____, _____ _____
last name first name initial

AGE: _____ SEX: _____ m=male f=female
years

The use of a standard form can speed data/information entry and reduce errors.

To create a form from main menu choose F3 for the Forms Branch and the FORMS branch menu appears:

FORMS Branch Menu (F3)

```
Main Menu
!F1 Help      !F2 Files      !F3 Forms      !F4 Dictionary  !F5 Data
!F6 Cleaning  !F7 Skip&Fill  !F8 Options    !F9             !F0 Exit
Press !Function Key to Select
```

```
Create/Edit Forms
                          Help  F1    aF1  Help
          Generate Default Form  F2    aF2
                  Place Variable F3    aF3
                Unplace Variable F4    aF4
                     Insert Line F5    aF5
                     Delete Line F6    aF6
                     Move Block  F7    aF7
              Change Entry Order F8    aF8
              Display Variable   F9    aF9
                        Draw Box F0    aF0
Press Function Key to Select
```

```
Ctrl Menu
^F1 Help        ^F2 Copy Text  ^F3 CopyField  ^F4 PasteText  ^F5 ShowText
^F6 Blank Field ^F7 ReSearch   ^F8 EditField  ^F9 VarInfo     ^F0 Complete
Press ^Function Key to Select
```

Begin to create a custom data entry ABC editing form by pressing F2 (Generate Default Form). The form you design will then be the default form for this file and will be displayed whenever you call for it.

There are two parts of creating a form: (1) typing in the headings, labels, and instructions which show where the data fields are and what they contain, as well as editing or data-entry instructions to the person using the form; and (2) placement of the fields on the form, that is, marking the spaces where the data for each field will be entered or displayed. These steps can be done in any order. A typical sequence of steps in designing a form might be:

1. Create a drawing of the desired form on paper for reference.

2. Begin design by typing in the heading for the form.

3. Type in a label to show where the first field is located.

4. Choose F3 from the Forms menu to Place a Variable for the first field label just typed.

5. Move the cursor to the position for the first variable and press **F3**. Choose the variable to be placed from the menu that appears in the middle of the screen.

6. Press **^F10** to complete the process for that variable.

7. Repeat these steps for as many variables as desired.

8. Use the box drawing feature (F10) to draw a box around one or more variables or sections of the form if desired.

SPSS File Types

There are seven types of files used in analysis and reporting with SPSS/PC+™. The table below lists each type of file, its contents and how it is used, the default file name, and how the file is written by the system or user. It is necessary to be fully familiar with these files and how to use them to make use of SPSS/PC+™.

Types of SPSS/PC+™ Files

Type	Contents & Use	Default Name	File Replaced
scratch pad	commands pasted from the menu or typed from EDIT mode. Also contains the results of displays, but only the most recent version.	SCRATCH.PAD	initialized on startup

listing	all output from commands and procedures when sent to the screen are also sent to this file. Holds error messages, tables, etc.	SPSS.LIS	initialized on startup
log	record of all command run, messages, location of output.	SPSS.LOG	initialized on startup
system file	all data, data dictionary, (including FORMS, RANGES, RULES, etc.) created in DATA ENTRY II.	SPSS.SYS	written by SAVE command only
portable file	contents of system file converted for transfer to some other machine/software. Created with the EXPORT command.	(none)	written by EXPORT command only
results file	results from particular commands and procedures. See list on p. A-16 of the SPSS/PC+ Base Manual.	SPSS.PRC	initialized on startup
initialization	commands to initialize the SPSS/PC+ system according to your particular needs or preferences. See the options for the commands SET (p.C-179) and SHOW (p. C-192).	SPSSPROF.INI	written from EDITOR or DOS command

NOTE: When a file is initialized by the system on startup, that means the previous contents of the file are erased. To save the contents of these files, they must be copied to another file name at the end of your SPSS/PC+ session or they will be lost.

Practice Dataset Exercise

There is a practice data set at the end of this section. It has the same variables for all students, but different data. The coding for the variables is as follows:

Variable	Meaning	Width	Type	Values
ID	identification #	3	numeric	
SEX	sex of respondent	1	string	m=male f=female
AGE	age in years	2	numeric	
POS	position type	1	numeric	1=Minister or Deputy 2=Department head 3=Bureau head 4=Professional staff 5=clerical staff 6=maint. & operations
MOSAL	monthly salary	6	numeric	
AGENCY	agency of work	1	numeric	1=Finance 2=Civil Service 3=Education 4=Transportation

1. Create an SPSS/PC+ system file for the data in your data set. The system file should contain the data dictionary and the data. Use DATA ENTRY II for this task.

2. Print a copy of the data dictionary.

3. RECODE the AGE and MOSAL variables into appropriate intervals.

4. Print a table of the frequencies for all variables.

5. Print a CROSSTABS table for:
   a. SEX BY MOSAL
   b. MOSAL BY AGENCY
   c. MOSAL BY POS

Each manual will have a copy of the original Pilot Study database in an SPSS/PC+™ System file (without the recoding of any variables). The exercises are to be done using this Pilot Study file. Be sure to keep a backup copy of your files on floppy disks in case files are erased or damaged on the hard drive.

SPSS/PC+™ Exercises

In real life use, printed reports must be professionally presented. Therefore, it is important that the user of this manual take care to treat any printed output from these exercises as if it were to be used in a real situation and need. Use the SET command to be sure the results are printed with the proper margins and page breaks.

Exercise 1: The data for the pilot study must be cleaned. Use the DATA ENTRY II section of the program to clean variables Y1 through Y27. For your variables, decide what the appropriate RANGES and RULES should be. Print a report of the cleaning pass by RULE and a copy of the RULES and RANGES used.

Exercise 2: Use the COMPUTE command to create the following new variables:

QUALTIME - number of years since the person received his highest qualification; compute from Y9.

CRSTIME1 - number of years since the person took their last course #1; compute from Y16.

CRSTIME2 - number of years since the person took their last course #1; compute from Y17.

YEARSERV - number of years of government service; compute from Y24.

Exercise 3: Use the DESCRIPTIVES command to print the mean, median, and standard deviation of these variables: Y6, Y25, QUALTIME, CRSTIME1, CRSTIME2, YEARSERV.

Exercise 4: Use the WRITE /VARIABLES command to print the values for Y1, Y2, Y3, and Y4, for the first 20 cases.

Exercise 5: Do three CROSSTABS of your choosing and print the results showing the row percent, column percent, and table percent in each cell. Write a few

sentences on the print-out saying what you think the table shows about the data.

Exercise 6: Use DATA ENTRY II to change the value label in Y1 from Ministry of Roads to Ministry of Municipalities.

Exercise 7: Use the SELECT IF command to print separate CROSSSTABS of Y1 BY Y8 for Al Thawra, Customs Authority, and Ministry of Municipalities.

APPENDIX

Pilot Study Data Dictionary

Variable: INDEX Label: INDEX NUMBER
No value labels Type: Number Width: 5 Dec: 0 Missing: * None *

Variable: Y1 Label: NAME OF WORK PLACE
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

22.00	CUSTOMS AUTHORITY	27.00	TEXTILE FACTORY
42.00	MINISTRY-ROADS,BLDGS	51.00	AL-THAWRA HOSPITAL
59.00	MINISTRY OF TRANSPOR	77.00	CARE-MARTYRS FAMILY
99.00	ALL OTHER RECORDS		

Variable: Y2 Label: PUBLIC ADMINISTRATION DEPT OR BUREAU
Value labels follow Type: Number Width: 3 Dec: 0 Missing: * None *

.00	NO SUBCODE	84.00	CUST-DEPT OF TARIFF
85.00	CUST-SUPN & INSPEC	86.00	CUST-ILLEGAL TRAFFIC
87.00	CUST-ADMIN/FINANCE	124.00	MRH-ADMIN & FINANCE
125.00	MRH-TECHNIC AFFAIRS	126.00	MRH-ENVIRONMT HEALTH
127.00	MRH-ADMIN & FINANCE	128.00	MRH-INSPECT & SUPVN
129.00	MRH-STATS & PLANNING	300.00	OFFICE-SUPREME COURT
400.00	VICE SUPREME COURT	500.00	OTHERS-UNSPECIFIED

Variable: Y3 Label: ORIGINAL MINISTRY OF WORK
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00	NOT SECONDED	2.00	PRIME MINISTRY
4.00	CENTRAL PLANNING	5.00	COUNS-SPORT & YOUTH
9.00	ARCHEOLOGY	20.00	YEMENI C-ROCKS&VEST
21.00	FINANCE MINISTRY	33.00	TAX AUTHORITY
47.00	MIN-CIVIL SERVICE	50.00	MIN-HEALTH
90.00	OTHER UNSPECIFIED		

Variable: Y4 Label: EMPLOYMENT GOVERNATE

Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00	SANAA CITY	2.00	SANAA
4.00	HODAIDA	7.00	HAJJAH
10.00	SAADA	11.00	MAREB
12.00	AL JAWF		

Variable: Y5 Label: SEX

Value labels follow Type: Number Width: 1 Dec: 0 Missing: 9.00

1.00	MALE	2.00	FEMALE

Variable: Y6 Label: AGE IN YEARS

No value labels Type: Number Width: 2 Dec: 0 Missing: 99.00

Variable: Y7 Label: NATIONALITY

Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00	YEMANI	2.00	EGYPTIAN
3.00	SUDANI	4.00	SOMALIAN
5.00	PALESTINIAN	6.00	SYRIAN
7.00	JORDANIAN	10.00	DE JUBOTI
11.00	OTHER ARABS	12.00	ETHIOPIAN
13.00	IRANIAN	14.00	INDIAN
17.00	FILIPINO	19.00	THAILANDI
20.00	HUNGARIAN	21.00	RUSSIAN
22.00	CZECHOSLOVAKIAN	24.00	OTHER NON-ARAB

Variable: Y8 Label: HIGHEST LEVEL OF EDUCATION

Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00	DOCTORATE	2.00	MASTERS DEGREE
3.00	HIGHER DIPLOMA	4.00	BACHELOR DEGREE
5.00	POST-SEC DIPLOMA	6.00	SECONDARY
7.00	POST-PREP DIPLOMA	8.00	PREPARATORY
9.00	POST-PRIM DIPLOMA	10.00	PRIMARY
11.00	LITERATE	12.00	NO EDUCATION

Variable: Y9 Label: YEAR HIGHEST QUALIFICATION WAS OBTAINED

Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00 NOT APPLICABLE

Variable: Y10 Label: AREA OF SPECIALIZATION

Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00	NOT APPLICABLE	2.00	OTHER POST-PRIMRY SPEC
3.00	ARCHITECT	4.00	ELECTRICIAN
5.00	MECHANICS	6.00	STEAM
7.00	DRILLING	8.00	DWELLING
9.00	RADIOLOGY-X RAY	10.00	NURSING
11.00	MED LABORATORY	12.00	PHARMACY
13.00	HEALTH	14.00	TEACHER
15.00	VETERINARY	16.00	AGRICULTURE
17.00	COMMERCE 4TH TECH	18.00	OTHER POST-PREP PROFESS
20.00	MICROWAVE	21.00	ADMIN DEV TECHNICIAN
22.00	OTHER POST-SEC PROFESS	23.00	ACCOUNTING
24.00	ECONOMICS	25.00	ADMINISTRATION
26.00	POLICY	27.00	OTHER COMMERCE SPECS
28.00	SHARE I & LOW	29.00	OTHER LAW SPECIALS
30.00	HISTORY	31.00	GEOGRAPHY
32.00	PSYCHOLOGY	35.00	SOCIOLOGY
36.00	ENGLISH STUDIES	37.00	ARABIC STUDIES
38.00	OTHER SPECIALIZATIONS	41.00	GEOLOGY
42.00	SCIENCE LABORATORY	44.00	OTHER SCIENCE SPECIALIZS
45.00	CIVIL ENGINEERING	46.00	ARCHITECT ENGINEERING
47.00	ILLEGIBLE ON CODEBOOK	48.00	AGRICULTURE SPECILST
49.00	GENERAL MEDICINE	50.00	OTHER UNIV SPECILZATION
60.00	2NDRY SCIENCE SECTION	70.00	2NDRY LITERARY SECTION
80.00	2NDARY EQUIVALENCE		

Variable: Y11 Label: COUNTRY OF STUDY IF UNIVERSITY EDUCATION
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00	NOT APPLICABLE	1.00	YEMEN
2.00	EGYPT	3.00	USSR
4.00	SAUDI ARABIA	5.00	IRAQ
6.00	SYRIA	7.00	DEMOCRATIC GERMANY
8.00	USA	9.00	CZECHOSLOVAKIA
10.00	HUNGARY	11.00	CHINA
12.00	UK	13.00	LIBYA
14.00	ALGERIA	16.00	KUWAIT
17.00	FRANCE	20.00	OTHER ARAB COUNTRIES
21.00	OTHER COUNTRIES		

Variable: Y12 Label: LENGTH OF STUDY IN YEARS
No value labels Type: Number Width: 1 Dec: 0 Missing: 9.00

Variable: Y13 Label: ATTENDED WORK RELATED COURSES?
Value labels follow Type: Number Width: 1 Dec: 0 Missing: 9.00

1.00	YES	2.00	NO

Variable: Y14 Label: SUBJECT OF LAST COURSE #1
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00	NOT APPLICABLE	1.00	CUSTOMS
2.00	TAXES	3.00	ENGLISH LANGUAGE
4.00	COMPUTERS	5.00	EMPLOYEE AFFAIRS
6.00	ACCOUNTING	7.00	TOWN OR CITY PLANNING
8.00	STATISTICS	9.00	DRAWING MAPS
10.00	PLANNING	11.00	PURCHASING AND STORING
12.00	ADMINISTRATION	13.00	HEALTH CARE
14.00	NURSING	15.00	MEDICAL LABORATORY
16.00	BLOOD BANKS	17.00	PSYCHOLOGY
18.00	FIRST AID	19.00	TRANSPLANT SURGERY
20.00	GENERAL SURGERY	21.00	PHARMACY
22.00	MEDICAL EQUIP REPAIR	23.00	SWITCHBOARD OPR
24.00	MEDICAL TERMINOLOGY	26.00	AGRICULTURE

27.00	MEDICAL DRUGS	28.00	LIVER DISEASE
29.00	HEART DISEASE	30.00	DIGESTIVE SYSTEM
32.00	X-RAY RADIOLOGY	33.00	SECRETARY
34.00	TYPING	37.00	HOUSING (DWELLING)
38.00	GEOMETRY	40.00	ELECTRONICS
41.00	PREVENTIVE MEDICINE	50.00	OTHER NOT SPECIFIED

Variable: Y15 Label: SUBJECT OF LAST COURSE #2
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

.00	NOT APPLICABLE	1.00	CUSTOMS
2.00	TAXES	3.00	ENGLISH LANGUAGE
4.00	COMPUTERS	5.00	EMPLOYEE AFFAIRS
6.00	ACCOUNTING	7.00	TOWN OR CITY PLANNING
8.00	STATISTICS	9.00	DRAWING MAPS
10.00	PLANNING	11.00	PURCHASING AND STORING
12.00	ADMINISTRATION	13.00	HEALTH CARE
14.00	NUSING	15.00	MEDICAL LABORATORY
16.00	BLOOD BANKS	17.00	PSYCHOLOGY
18.00	FIRST AID	19.00	TRANSPLANT SURGERY
20.00	GENERAL SURGERY	21.00	PHARMACY
22.00	MEDICAL EQUIP REPAIR	23.00	SWITCHBOARD OPR
24.00	MEDICAL TERMINOLOGY	26.00	AGRICULTURE
27.00	MEDICAL DRUGS	28.00	LIVER DISEASE
29.00	HEART DISEASE	30.00	DIGESTIVE SYSTEM
32.00	X-RAY RADIOLOGY	33.00	SECRETARY
34.00	TYPING	37.00	HOUSING (DWELLING)
38.00	GEOMETRY	40.00	ELECTRONICS
41.00	PREVENTIVE MEDICINE	50.00	OTHER NOT SPECIFIED

Variable: Y16 Label: DATE OF LAST COURSE #1
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00
.00 NOT APPLICABLE

Variable: Y17 Label: DATE OF LAST COURSE #2
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00
.00 NOT APPLICABLE

Variable: Y18 Label: DURATION OF LAST COURSE #1
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00
.00 NOT APPLICABLE

Variable: Y19 Label: DURATION OF LAST COURSE #2
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00
.00 NOT APPLICABLE

Variable: Y20 Label: OCCUPATION STATUS
Value labels follow Type: Number Width: 1 Dec: 0 Missing: 9.00

1.00 PERMANENT	2.00 CONTRACTED
3.00 SEASONAL	4.00 DAILY WAGE

Variable: Y21 Label: CURRENT GRADE
No value labels Type: Number Width: 2 Dec: 0 Missing: 99.00

Variable: Y22 Label: OCCUPATION NAME
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00 DEPUTY MINISTER	2.00 ASSOCIATION CHAIRMAN
4.00 AUTHORITY CHAIRMAN	12.00 OFFICE-CHAIRMAN
13.00 DIRECTOR GENERAL	16.00 GOVERNATE DIR GENL
17.00 HEAD 1ST SPECIALIST	19.00 HEAD 2ND SPECIALIST
21.00 FIRST SPECIALIST	22.00 FIRST RESEARCHER
24.00 SECOND SPECIALIST	27.00 THIRD SPECIALIST
28.00 THIRD RESEARCHER	29.00 DEPARTMENT MANAGER
30.00 HEAD OF TECHNICIANS	31.00 DIVISION HEAD
32.00 FIRST TECHNICIAN	33.00 UNIT HEAD
34.00 SECOND TECHNICIAN	35.00 THIRD TECHNICIAN
36.00 FOURTH TECHNICIAN	37.00 FIFTH TECHNICIAN
38.00 TECHNICIAN ASSISTANT	39.00 TECHNICIAN-OTHER
40.00 DEPARTMENT MANAGER	41.00 HEAD OF CLERKS
42.00 DIVISION HEAD	43.00 FIRST CLERK
44.00 UNIT HEAD	45.00 SECOND CLERK
46.00 THIRD CLERK	47.00 FORTH CLERK
48.00 FIFTH CLERK	49.00 CLERK-ASSISTANT
50.00 CLERK-OTHER	52.00 HEAD OF OBSERVER

53.00	1ST OBSERVER	54.00	2ND OBSERVER
55.00	3RD OBSERVER	56.00	4TH OBSERVER
57.00	ASSISTANT OBSERVER	58.00	SERVICE MANAGER
59.00	SERVICE ASSISTANT	60.00	SERVICE CLERK
61.00	OTHER NOT MENTIONED		

Variable: Y23 Label: OCCUPATION NATURE
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00	HUMAN PHYSICIAN	2.00	DENTIST
3.00	HIGH NURSE	4.00	OTHER NURSE
5.00	PHARMACIST	6.00	OTHER MEDICAL PROFESSION
7.00	CIVIL ENGINEERING	8.00	* Null label *
9.00	MECHANICAL ENGINEERING	10.00	CHEMICAL ENGINEERING
11.00	INDUSTRIAL ENGINEERING	12.00	OIL ENGINEERING
13.00	ELECTRICAL ENGINEERING	14.00	OTHER ENGINEERING
15.00	AGRICULTURAL SPECIALIST	16.00	LAW SPECIALIST
17.00	DAWA GUIDANCE SPEC	18.00	EDUCATION GUIDE SPEC
19.00	FOOD SPECIALIST	20.00	LIBRARY SPECIALIST
21.00	ARTS SPECIALIST	22.00	INFORMATION SPECIALIST
23.00	STATISTICS MATH SPEC	24.00	SCIENCE SPECIALIST
25.00	COMMERCE OR TRADE SPEC	26.00	FINANCE-ACCT SPEC
27.00	ADMIN DEVP SPECIALIST	28.00	SPEC PROF ENGINEER
29.00	CLERICAL PROFESSION	30.00	NURSE-PUB HEALTH TECH
31.00	SUPPORT GEOM TECH	32.00	AGRICULTURE SPEC
33.00	EDUCATION TECHNICIAN	34.00	DAWA & GUIDANCE TECH
35.00	SOCIAL SERVICE TECH	36.00	LABORATORY TECH
37.00	ARCHITECT TECH	38.00	FOOD TECHNICIAN
39.00	OTHER PROFESS TECH	40.00	
41.00		42.00	
43.00		44.00	
45.00		46.00	SUPPORTIVE SERVICES
50.00	OTHER SERVICES		

Variable: Y24 Label: YEAR ENTERED YEMENI GOVERNMENT SERVICE
No value labels Type: Number Width: 2 Dec: 0 Missing: 99.00

Variable: Y25 Label: NUMBER OF YEARS IN CURRENT POSITION
No value labels Type: Number Width: 2 Dec: 0 Missing: 99.00

Variable: Y26 Label: BASIC MONTHLY SALARY - YR
Value labels follow Type: Number Width: 2 Dec: 0 Missing: 99.00

1.00	LESS THAN $500	2.00	$501-$1000
3.00	$1001-$1500	4.00	$1501-$2000
5.00	$2001-$2500	6.00	$2501-$3000
7.00	$3001-$4000	8.00	$4001-$5000
9.00	$5001-$6000	10.00	6001-$7000
11.00	$7001-$8000	12.00	$8001-$9000
13.00	$9001-$10000	14.00	MORE THAN $10000

Variable: Y27 Label: TOTAL MONTHLY SALARY - YR
No value labels Type: Number Width: 1 Dec: 0 Missing: 9.00

Listing of program to produce frequency counts for Pilot Survey Data - based on Survey variable labels:

```
TITLE 'SPSS-PC 1988 FREQUENCY RUN FOR YEMEN QUESTIONNAIRE'
DATA LIST FILE='A:DATA.PRN'
/INDEX 1-5 Y1 6-7 Y2 8-10 Y3 Y4 11-14 Y5 15 Y6 TO Y11 16-27
 Y12 Y13 28-29 Y14 TO Y19 30-41 Y20 42 Y21 TO Y26 43-54
 Y27 55.
VARIABLE LABELS INDEX 'INDEX NUMBER'
/Y1 'NAME OF WORK PLACE'
/Y2 'PUBLIC ADMINISTRATION DEPT OR BUREAU'
/Y3 'ORIGINAL MINISTRY OF WORK'
/Y4 'EMPLOYMENT GOVERNATE'
/Y5 'SEX'
/Y6 'AGE IN YEARS'
/Y7 'NATIONALITY'
/Y8 'HIGHEST LEVEL OF EDUCATION'
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/Y9 'YEAR HIGHEST QUALIFICATION WAS OBTAINED'
/Y10 'AREA OF SPECIALIZATION'
/Y11 'COUNTRY OF STUDY IF UNIVERSITY EDUCATION'
/Y12 'LENGTH OF STUDY IN YEARS'
/Y13 'ATTENDED WORK RELATED COURSES?'
/Y14 'SUBJECT OF LAST COURSE #1'
/Y15 'SUBJECT OF LAST COURSE #2'
/Y16 'DATE OF LAST COURSE #1'
/Y17 'DATE OF LAST COURSE #2'
/Y18 'DURATION OF LAST COURSE #1'
/Y19 'DURATION OF LAST COURSE #2'
/Y20 'OCCUPATION STATUS'
/Y21 'CURRENT GRADE'
/Y22 'OCCUPATION NAME'
/Y23 'OCCUPATION NATURE'
/Y24 'YEAR ENTERED YEMENI GOVERNMENT SERVICE'
/Y25 'NUMBER OF YEARS IN CURRENT POSITION'
/Y26 'BASIC MONTHLY SALARY - YR'
/Y27 'TOTAL MONTHLY SALARY - YR'.
VALUE LABELS Y1 22 'CUSTOMS AUTHORITY' 27 'TEXTILE FACTORY'
  42 'MINISTRY-ROADS,BLDGS' 51 'AL-THAWRA HOSPITAL'
  59 'MINISTRY OF TRANSPOR' 77 'CARE-MARTYRS FAMILY'
  99 'ALL OTHER RECORDS'
/Y2 0 'NO SUBCODE' 84 'CUST-DEPT OF TARIFF'
  85 'CUST-SUPN & INSPEC' 86 'CUST-ILLEGAL TRAFFIC'
  87 'CUST-ADMIN/FINANCE'
  124 'MRH-ADMIN & FINANCE' 125 'MRH-TECHNIC AFFAIRS'
  126 'MRH-ENVIRONMT HEALTH' 127 'MRH-ADMIN & FINANCE'
  128 'MRH-INSPECT & SUPVN' 129 'MRH-STATS & PLANNING'
  300 'OFFICE-SUPREME COURT' 400 'VICE SUPREME COURT'
  500 'OTHERS-UNSPECIFIED'
/Y3 0 'NOT SECONDED' 2 'PRIME MINISTERY'
  4 'CENTRAL PLANNING' 5 'COUNS-SPORT & YOUTH' 9 'ARCHEOLOGY'
 20 'YEMENI C-ROCKS&VEST' 21 'FINANCE MINISTRY'
 33 'TAX AUTHORITY' 47 'MIN-CIVIL SERVICE'
 50 'MIN-HEALTH' 90 'OTHER UNSPECIFIED'
/Y4 1 'SANAA CITY' 2 'SANAA' 4 'HODAIDA' 7 'HAJJAH'
 10 'SAADA' 11 'MA AREB' 12 'AL JAWF'
/Y5 1 'MALE' 2 'FEMALE'
/Y7 1 'YEMANI' 2 'EGYPTIAN' 3 'SUDANI' 4 'SOMALIAN'
  5 'PALESTINIAN' 6 'SYRIAN' 7 'JORDANIAN' 10 'DE JUBOTI'
 11 'OTHER ARABS' 12 'ETHIOPIAN' 13 'IRANIAN' 14 'INDIAN'
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   17 'FILIPINO' 19 'THAILANDI' 20 'HUNGARIAN' 21 'RUSSIAN'
   22 'CZECHOSLOVAKIAN' 24 'OTHER NON-ARAB'
 /Y8 01 'DOCTORATE' 02 'MASTERS DEGREE' 03 'HIGHER DIPLOMA'
   04 'BACHELOR DEGREE' 05 'POST-SEC DIPLOMA' 06 'SECONDARY'
   07 'POST-PREP DIPLOMA' 08 'PREPARATORY'
   09 'POST-PRIM DIPLOMA' 10 'PRIMARY' 11 'LITERATE'
   12 'NO EDUCATION'
 /Y9 0 'NOT APPLICABLE'
 /Y10 0 'NOT APPLICABLE' 2 'OTHER POST-PRIMRY SPEC'
    3 'ARCHITECT' 4 'ELECTRICIAN' 5 'MECHANICS' 6 'STEAM'
    7 'DRILLING' 8 'DWELLING' 9 'RADIOLOGY-X RAY' 10 'NURSING'
   11 'MED LABORATORY' 12 'PHARMACY' 13 'HEALTH' 14 'TEACHER'
   15 'VETERINARY' 16 'AGRICULTURE' 17 'COMMERCE 4TH TECH'
   18 'OTHER POST-PREP PROFESS' 20 'MICROWAVE'
   21 'ADMIN DEV TECHNICIAN' 22 'OTHER POST-SEC PROFESS'
   23 'ACCOUNTING' 24 'ECONOMICS' 25 'ADMINISTRATION'
   26 'POLICY' 27 'OTHER COMMERCE SPECS' 28 'SHARE I & LOW'
   29 'OTHER LAW SPECIALS' 30 'HISTORY' 31 'GEOGRAPHY'
   32 'PSYCHOLOGY' 35 'SOCIOLOGY' 36 'ENGLISH STUDIES'
   37 'ARABIC STUDIES' 38 'OTHER SPECIALIZATIONS' 41 'GEOLOGY'
   42 'SCIENCE LABORATORY' 44 'OTHER SCIENCE SPECIALIZS'
   45 'CIVIL ENGINEERING' 46 'ARCHITECT ENGINEERING'
   47 'ILLEGIBLE ON CODEBOOK' 48 'AGRICULTURE SPECILST'
   49 'GENERAL MEDICINE' 50 'OTHER UNIV SPECILZATION'
   60 '2NDRY SCIENCE SECTION' 70 '2NDRY LITERARY SECTION'
   80 '2NDARY EQUIVALENCE'
/Y11 0 'NOT APPLICABLE' 1 'YEMEN' 2 'EGYPT' 3 'USSR'
   4 'SAUDI ARABIA' 5 'IRAQ' 6 'SYRIA' 7 'DEMOCRATIC GERMANY'
   8 'USA' 9 'CZECHOSLOVAKIA' 10 'HUNGARY' 11 'CHINA' 12 'UK'
  13 'LIBYA' 14 'ALGERIA' 16 'KUWAIT' 17 'FRANCE'
  20 'OTHER ARAB COUNTRIES' 21 'OTHER COUNTRIES'
/Y13 1 'YES' 2 'NO'
/Y14 Y15 0 'NOT APPLICABLE' 1 'CUSTOMS' 2 'TAXES'
   3 'ENGLISH LANGUAGE' 4 'COMPUTERS' 5 'EMPLOYEE AFFAIRS'
   6 'ACCOUNTING' 7 'TOWN OR CITY PLANNING' 8 'STATISTICS'
   9 'DRAWING MAPS' 10 'PLANNING' 11 'PURCHASING AND STORING'
  12 'ADMINISTRATION' 13 'HEALTH CARE' 14 'NUSING'
  15 'MEDICAL LABORATORY' 16 'BLOOD BANKS' 17 'PSYCHOLOGY'
  18 'FIRST AID' 19 'TRANSPLANT SURGERY' 20 'GENERAL SURGERY'
  21 'PHARMACY' 22 'MEDICAL EQUIP REPAIR'
  23 'SWITCHBOARD OPR' 24 'MEDICAL TERMINOLOGY'
  26 'AGRICULTURE'
  27 'MEDICAL DRUGS' 28 'LIVER DISEASE' 29 'HEART DISEASE'
  30 'DIGESTIVE SYSTEM'
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  32 'X-RAY RADIOLOGY' 33 'SECRETARY' 34 'TYPING'
  37 'HOUSING (DWELLING)' 38 'GEOMETRY' 40 'ELECTRONICS'
  41 'PREVENTIVE MEDICINE' 50 'OTHER NOT SPECIFIED'
 /Y16 Y17 Y18 Y19 0 'NOT APPLICABLE'
 /Y20 1 'PERMANENT' 2 'CONTRACTED' 3 'SEASONAL'
   4 'DAILY WAGE'
 /Y22 1 'DEPUTY MINISTER' 2 'ASSOCIATION CHAIRMAN'
   4 'AUTHORITY CHAIRMAN' 12 'OFFICE-CHAIRMAN'
  13 'DIRECTOR GENERAL' 16 'GOVERNATE DIR GENL'
  17 'HEAD 1ST SPECIALIST' 19 'HEAD 2ND SPECIALIST'
  21 'FIRST SPECIALIST' 22 'FIRST RESEARCHER'
  24 'SECOND SPECIALIST' 27 'THIRD SPECIALIST'
  28 'THIRD RESEARCHER' 29 'DEPARTMENT MANAGER'
  30 'HEAD OF TECHNICIANS' 31 'DIVISION HEAD'
  32 'FIRST TECHNICIAN' 33 'UNIT HEAD'
  34 'SECOND TECHNICIAN' 35 'THIRD TECHNICIAN'
  36 'FOURTH TECHNICIAN'
  37 'FIFTH TECHNICIAN' 38 'TECHNICIAN ASSISTANT'
  39 'TECHNICIAN-OTHER' 40 'DEPARTMENT MANAGER'
  41 'HEAD OF CLERKS'
  42 'DIVISION HEAD' 43 'FIRST CLERK' 44 'UNIT HEAD'
  45 'SECOND CLERK' 46 'THIRD CLERK' 47 'FORTH CLERK'
  48 'FIFTH CLERK' 49 'CLERK-ASSISTANT' 50 'CLERK-OTHER'
  52 'HEAD OF OBSERVER' 53 '1ST OBSERVER' 54 '2ND OBSERVER'
  58 'SERVICE MANAGER' 59 'SERVICE ASSISTANT'
  60 'SERVICE CLERK' 61'OTHER NOT MENTIONED'
/Y23 1'HUMAN PHYSICIAN' 2 'DENTIST' 3 'HIGH NURSE'
  6 'OTHER MEDICAL PROFESSIONS' 7 'CIVIL ENGINEERING' 8 ''
  9 'MECHANICAL ENGINEERING' 10 'CHEMICAL ENGINEERING'
 11 'INDUSTRIAL ENGINEERING' 12 'OIL ENGINEERING'
 13 'ELECTRICAL ENGINEERING' 14 'OTHER ENGINEERING'
 15 'AGRICULTURAL SPECIALIST' 16 'LAW SPECIALIST'
 17 'DAWA T GUIDANCE SPEC' 18 'EDUCATION GUIDE SPEC'
 19 'FOOD SPECIALIST' 20 'LIBRARY SPECIALIST'
 21 'ARTS SPECIALIST' 22 'INFORMATION SPECIALIST'
 23 'STATISTICS MATH SPEC' 24 'SCIENCE SPECIALIST'
 25 'COMMERCE OR TRADE SPEC' 26 'FINANCE-ACCT SPEC'
 27 'ADMIN DEVP SPECIALIST' 28 'SPEC PROF ENGINEER'
 29 'CLERICAL PROFESSION' 30 'NURSE-PUB HEALTH TECH'
 31 'SUPPORT GEOM TECH' 32 'AGRICULTURE SPEC'
 33 'EDUCATION TECHNICIAN' 34 'DAWA & GUIDANCE TECH'
 35 'SOCIAL SERVICE TECH' 36 'LABORATORY TECH'
 37 'ARCHITECT TECH' 38 'FOOD TECHNICIAN'
 39 'OTHER PROFESS TECH' 40 ' ' 41 ' ' 42 ' ' 43 ' '
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  44 ' ' 45 ' ' 46 'SUPPORTIVE SERVICES'
  50 'OTHER SERVICES'
 /Y26 1 'LESS THAN $500' 2 '$501-$1000' 3 '$1001-$1500'
   4 '$1501-$2000' 5 '$2001-$2500' 6 '$2501-$3000'
   7 '$3001-$4000' 8 '$4001-$5000' 9 '$5001-$6000'
  10 '6001-$7000' 11 '$7001-$8000' 12 '$8001-$9000'
  13 '$9001-$10000' 14 'MORE THAN $10000'.
 MISSING VALUE Y5 Y12 Y13 Y20 Y27 (9) Y1 Y3 Y4 Y6 TO Y11
   Y14 TO Y19 Y21 TO Y26 (99).
 RECODE Y4 (13 THRU 98=99).
 RECODE Y5 (0=9) (3 THRU 8=9).
 RECODE Y6 (0 THRU 17=99)  (61 THRU 91=99).
 RECODE Y7 (36 THRU 82=99).
 RECODE Y8 (0=99)  (14 THRU 98=99).
 RECODE Y9 (1 THRU 39=99).
 RECODE Y10 (66 THRU 92=99).
 RECODE Y11 (22 THRU 65=99).
 RECODE Y12 (4 THRU 7=9).
 RECODE Y13 (0=9).
 RECODE Y14 Y15 (43=99)  (60 THRU 68=99).
 RECODE Y16 Y17 (20 THRU 39=99).
 RECODE Y18 Y19 (49 THRU 98=99).
 RECODE Y20 (0=9).
 RECODE Y21 (14 THRU 98=99).
 RECODE Y22 (62 THRU 98=99).
 RECODE Y25 (35 THRU 98=99).
 RECODE Y26 (0=99) (15 THRU 95=99).
 RECODE Y27 (0=9).
 FREQUENCIES VARIABLES=Y1 TO Y27.
 FINISH.
```

A REVIEW OF BASIC STATISTICS

A REVIEW OF BASIC STATISTICS

Definitions

In order to acquire a basic introduction to the field of statistics, a few terms need to be defined. These terms will be used as we proceed with our discussions.

population - A set or collection of people, things, measurements, observations, etc., which are of interest. For example, the entire government work force in Yemen is one population. Another might be all registered voters in the United States. Usually populations are large, but there is no requirement that this be the case.

sample - Any subset of a population. For example, the people working in the Ministry of Education might be considered a sample of the population of government workers in Yemen while the registered voters in New York State would be a sample of all registered voters in the United States. Usually samples are much smaller than populations and normally samples are used when it is too expensive or unwieldy (too much time, too many in the population, etc.) to work with an entire population. Note, too, that one person's sample could be another person's population. The choice of sample and population is up to the researcher.

parameter - Any descriptive measure associated with a population. For example, the proportion of males in the Yemen government work force or the average age of voters in the United States. In statistics, parameters are usually denoted by Greek symbols.

statistic - Any descriptive measure associated with a sample. For example, the proportion of males in the Ministry of Education or the average age of voters in New York State. Statistics are denoted by regular alphabetic characters.

variable - A characteristic that can take on different values and is of interest to the researcher. For example, sex, age, salary, rank, etc. Variables are usually denoted as X or Y.

The whole process of statistics is one in which a population of interested is defined by the researcher who, because of certain constraints (such as time and money) draws from that population, at random, a sample. Statistics are then calculated on that sample and these statistics are used to infer the values of the population parameters.

NOTE: A random sample is a sample in which each member of the population has an equal chance of being included in the study.

Types of Data

Different variables produce different types of data. Each type of data has its own properties and different statistical analyses require different types of data. (Likewise, the data you collect determine the statistical tests you may use.) The four types of data are: categorical (nominal), ordinal, interval, and ratio.

Categorical or nominal data are data that fall into categories. For example, sex is a categorical variable as it takes on the values of male and female. All that we can say about categorical data is whether two values are the same or different, or in other words, do two pieces of data fall into the same or different categories. Other examples of categorical variables would be occupation, region, race, etc.

Ordinal data are data that fall into ranks. With ordinal data we can place a piece of data on some continuum but we cannot say anything about the distance between pieces of data. An ordinal scale is one that tells us about order or rankings. For example, the results of a horse race is an ordinal scale. We know what horse came in first, which came in second, and which came in last. Another example is the Moh's scale for the hardness of rocks. In this case, rock A is ranked harder than rock B if rock A can scratch rock B. What we do not know from this scale is how much harder rock A is than rock B.

Interval data tell us order but we can also make statements about the distances between pieces of data. This is because equal distances on the scale mean equal differences on the variable being measured. A classic example is temperature in degrees Centigrade. The difference between 10° and 20° C is exactly the same as the difference between 40° and 50° C - 10 degrees. This was not the case in ordinal data. An interval scale does, however, lack a true zero point - a point which represents the complete lack of the variable being measured. In temperature, 0° C is merely the point at which water freezes. It

does not indicate the point at which there is no temperature. The choice of the zero point in an interval scale is completely arbitrary.

Ratio data, on the other hand, do have a true zero point in addition to all the other properties of interval data. The presence of a true zero point allows us to make statements about the ratios present in our data. For example, if one piece of wood is 1 meter long and another piece of wood is 2 meters long, we can say that the piece of wood 2 meters long is twice as long as the piece which measures 1 meter in length. Other examples of ratio data are weight, height, number of items correct on a test, etc.

Frequency Distributions

When dealing with categorical data, one of the first questions to be answered is "How many people fall into a particular category?" To answer this question a frequency table needs to be constructed. Such a table summarizes very quickly the number of people in each category and allows the researcher to make comparative statements about the data. For example, which category has the most people, which has the least people, does category A have more people in it than category B, etc. The table, below, gives the frequency distribution for a sample of people who were asked their religion. (Note that this table is identical to that produced by SPSS/PC+.)

RELIGION

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
ISLAMIC	1	84	60.0	60.9	60.9
CATHOLIC	2	34	24.3	24.6	85.5
PROTESTANT	3	20	14.3	14.5	100.0
	.	2	1.4	MISSING	100.0
	TOTAL	140	100.0	100.0	

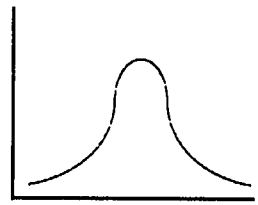
In this table we see that we had 84 members of the Islamic faith in our sample (which were coded as 1 in our data), 34 Catholics (coded 2), 20 Protestants (coded 3), and 2 people that did not tell us their religion. These raw frequencies translate to 60.0%, 24.3%, 14.3%, and 1.4%, respectively. The Valid Percent column recalculates the percentages with the missing cases removed, i.e., the percentages are based on a sample drops of 138 rather than 140 (the 2 missing people with missing data are removed). The Cum Percent column is just the sum of the Valid Percents — 60.9% of our sample is Islamic, 85.5% (60.9% + 24.6%) are either Islamic or Catholic, and 100.0% (60.9% + 24.6% + 14.5%) are either Islamic, Catholic, or Protestant.

Exercise 1 - Using the TEACH.SYS file, produce frequency tables for the SEX and AGEGRP variables using SPSS/PC+. What percentage of the sample is male? How many people fall into the 31-40 age group?

If frequency distributions are graphed, they sometimes show certain characteristics. If most of the scores fall at either the low end or the high end of the scale, the distribution is said to be skewed. If most of the scores lie at the low end, the distribution is said to be positively skewed while if most of the scores lie at the high end, the distribution is said to be negatively skewed. (The direction of the tail tells you the type of skew — if the tail points to the left, it is negatively skewed; if it points to the right, it is positively skewed.) If the distribution is shaped such that when a line is drawn down the middle, the two halves that are formed can be folded on top of one another, the distribution is said to be symmetric. The pictures below provide examples of these distribution shapes.

Negative Skew

Positive Skew



Symmetric

Measures of Central Tendency

When dealing with either interval or ratio data, especially when the data extends over a wide range of values, using only a frequency table is insufficient to fully describe the data. There is just so much data present the researcher becomes lost in it. What is needed is some method by which a large amount of data can be reduced down to a few measures which provide the researcher with a picture of the data. Measures of central tendency provide just such measures. They are statistics that can be calculated from our sample and they provide us with information regarding the "average score" of our distribution. The one thing to remember is that there are many types of "averages." We will deal with only three of them but they are all measures of central tendency.

The easiest to calculate is the **mode**. The mode is simply the score that occurs the most frequently in our distribution. Given the following set of scores: 3, 4, 4, 9, 13; the mode would be 4. The mode is the only measure of central tendency that can be used with categorical data. In our RELIGION frequency table presented above, then, the mode would be Islamic as it is the category which contains the most people. Note that it is possible for a distribution to have more than one mode. For example, a distribution with two modes is called bimodal.

Another measure of central tendency is the **median**. The median is defined as the score at or below which 50% of the distribution lies. It can be thought of as the "middle score" of the distribution. When there is an odd number of cases in the sample, simply arrange the scores in order from smallest to largest and the median is the middle score. For example, in the set of scores 3, 4, 4, 9, 13, the median would be 4. When there is an even number of cases in the sample, the median is the average of the two middle scores. For example, in the set of scores 3, 4, 6, 8, the median would be [(4+6)/2] or 5.

The most well known of the measures of central tendency is the **mean**. It is what most people think of when they think of an average. It is just the sum of all the scores in a sample divided by the number of scores in a sample. In terms of a formula, the mean is defined as:

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

The Σ sign is the Greek letter *sigma* and it means "the sum of." It is just a statistical shorthand (abbreviation) that means add up all the scores which are designated (following the character). The X in the formula represents the score and the n represents the number of people (or whatever you are measuring) in the sample. When dealing with a population, the formula is:

$$\mu = \frac{\sum_{i=1}^{n} X_i}{N}$$

The μ sign is the Greek letter *mu* and it represents the mean of a population. The N represents the number of people in the population. In the vast majority of cases you will not have a population so your attention will be on X, the mean of a sample.

If we use the following set of data as our sample: 3,4,4,9,13; the mean of this distribution would be calculated as follows:

$$\bar{X} = \frac{(3+4+4+9+13)}{5} = \frac{33}{5} = 6.6$$

Exercise 2 - Calculate the mode, median, and mean of the following set of data:
11,11,12,12,12,12,12,13,13,14,14,15,15,15,16,16,16,16,16,16,17,
17,18,18,19,20,20,21, 22,22

Note that the mean is the only measure of central tendency that takes into account every single case in the distribution. It can be thought of as the balance point of the distribution. This means that it is extremely susceptible to changes in the data. Adding a very large score to the distribution will cause the mean to increase while adding a very small score will cause the mean to decrease. For example, adding a score of 30 to our little 5 case sample causes the mean to increase to 10.5 [(3+4+4+9+13+30)/6].

If you know the three measures of central tendency, you also have a pretty good idea as to the shape of the distribution. If the mean is less than the median and the median is less than the mode, the distribution is negatively skewed. If the mean is greater than the median and the median is greater than the mode, the distribution is positively skewed. If the mean, the median, and the mode are the same score, the distribution is symmetric.

The most important thing to remember about measures of central tendency is that they are all scores. They can all be represented as points on the X-axis of a graph of the data.

Exercise 3 - Measures of central tendency can easily be calculated by computer using the DESCRIPTIVES procedure in SPSS/PC+. Using this procedure with the TEACH.SYS file, find the descriptive statistics for the variables AGE, Q1, and Q2.

Note that the DESCRIPTIVES procedure provides the user with a variety of statistics. The skewness statistics indicates the degree of skewness present in the distribution—if the statistics are negative, the distribution is negatively skewed while if it is positive, the distribution is positively skewed. If it has a value of zero, the distribution is symmetric. The kurtosis statistic tells us how peaked the distribution is. If the statistic has a negative value, the distribution has a relatively flat top. If the value is positive, the distribution has a sharp peak to it. And if the distribution looks like a normal (or bell shaped) curve, the statistic will have a value very close to zero.

Measures of Variability

Just knowing the "average" score of a distribution is not enough to fully describe a set of data. One must also have some idea about the amount of "spread" in the data. How similar are the scores? Are the scores all clustered around the mean or are they spread out across a wide range? Measures of variability allow us to quantify the amount of dispersion present in the data.

The simplest measure of variability is the **range**. The range is nothing more than the distance between the largest score and the smallest score:

range = largest score - smallest score

The range is very easy to calculate, but it is only based on two pieces of data. A more useful measure would be one that, like the mean, takes into account every score in the distribution.

One such measure is the **variance**. The variance measures the degree to which scores cluster around, or deviate from, the mean. The formula for the variance is as follows:

$$S^2 = \frac{\sum_{i=1}^{n} (X_i - \overline{X})^2}{n} = \frac{\Sigma X^2}{n} - X^2$$

(The second of the formulas given is called the computational formula. It is easier to use when calculating the variance than the first one.)

As you can see, the variance involves taking the difference between every score and the mean:

$$(X - \overline{X})^2$$

The difference is squared because if you sum the differences without first squaring them, the sum is equal to zero. (This is because the mean is the balance point of the distribution.) Squaring the differences takes care of this problem. The variance can be thought of as the mean squared deviation from the mean. It can take on any value from zero to positive infinity. If the value is zero, it means that every person in the distribution had exactly the same score — hence, no variation. Note that the variance can never be negative. If it is, you have made a mistake in your calculations.

If we take our 5 case sample as an example, the variance would be calculated as follows:

$$S^2 = \frac{(3^2 + 4^2 + 4^2 + 9^2 + 13^2)}{5} - 6.6^2$$

$$= \frac{291}{5} - 43.56 = 58.2 - 43.56 = 14.64$$

Exercise 4 - Using the data from Exercise 3, calculate the variance of the scores.

The only problem with the variance is that it is a squared measure. It is not in the same units as the original data. To make the measure a bit more useful, the square root of the

variance is employed. This measure of variability is called the **standard deviation** (denoted as "s".) In other words, the standard deviation is nothing more than the square root of the variance. After taking the square root, the measure is now on the same scale as the original data. This allows us to say that score A lies 1 standard deviation above the mean while score B lies 1.5 standard deviations below the mean. For our 5 case example, then, the standard deviation is:

$$s = \sqrt{s^2} = \sqrt{14.64} = 3.8262$$

Note, then, to calculate the standard deviation, one must first calculate the variance.

Just like the variance, the standard deviation can be no smaller than zero, where zero would indicate no variation. The upper limit of the standard deviation is one-half of the range (range/2). This upper limit will only occur if exactly half of the distribution received the smallest score and the other half received the largest score.

Exercise 5 - Using the data in Exercise 3, calculate the standard deviation of the distribution.

Exercise 6 - As was the case for measures of central tendency, the DESCRIPTIVES procedure in SPSS/PC+ can be employed to calculate the measures of variability for a set of data. Using the TEACH.SYS file, find the range, variance, and standard deviation for the variables Q7, Q8, and Q9.

Crosstabulation

Very often a researcher is interested in the relationship between two categorical variables. In survey work it is often useful to investigate whether responses to one item are related to responses on a second item. For example, is the sex of a respondent related to their educational level? This question can be answered through the use of cross-tabulations or contingency tables.

		Sex		
		Male	Female	Total
Educ. Level	Secondary	100	100	200
	Bachelors	80	70	150
	Masters	40	60	100
	Doctorate	30	20	50
		250	250	500 Grand Total

In the above table we are relating the sex of the subject to the subject's educational level. Each cell of the table contains a frequency so we know, for example, that 80 of the male subjects have a Bachelor's degree. The numbers at the end of each row and column are called the marginals. They indicate the total number of subjects in each row and column. The number in the lower right corner (500) is the total number of subjects in the table.

The question to be answered here is "Are the two variables being examined, sex and educational level, independent of each other or are they related in some fashion?" To say it another way, "Are the frequencies observed across categories in one variable the same for all categories of the second variable?" In the case of our example, "Are the frequencies observed for males across the educational levels the same as those observed for females?"

The statistic used to answer this question is a chi-square ($\chi 2$). A $\chi 2$ statistic allows us to test the independence of two categorical variables. The formula is as follows:

$$\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where: Oij = observed frequency for cell ij and

The expected frequency is the number of people we would expect to find in a cell if the two variables are independent of one another. It is calculated as follows:

$$E_{ij} = \frac{(\text{row i total})(\text{column j total})}{n}$$

where: n = number of people in table

If the observed and expected frequencies are close to one another, we have independence. If they are very different, it indicates the variables are related.

The expected frequency for the Secondary-Males cell, the 1-1 cell would then be:

$$E_{ij} = \frac{(200)(250)}{500} = 100$$

Exercise 7 - Calculate E12 (Secondary-Female) and E31 (Masters-Male).

Once the expected frequencies have been calculated, the statistic can be readily calculated:

$$= \frac{(100 - 100)^2}{100} + \frac{(100 - 100)^2}{100} + \frac{(80 - 75)^2}{75} + \frac{(70 - 75)^2}{75}$$

$$+ \frac{(40 - 50)^2}{50} + \frac{(60 - 50)^2}{50} + \frac{(30 - 25)^2}{25} + \frac{(20 - 25)^2}{25}$$

$$= 6.667$$

The degrees of freedom (df) for a chi-square statistic are (r-1) (c-1) where r equals the number of rows in the table and c equals the number of columns. For our example, then,

df = (4-1)(2-1) = (3)(1) = 3. (A degree of freedom is the number of observations free to vary with the restrictions of a given dataset. That is, for a set of four data, the first three you pick can be any of the four; the fourth is not free to vary, as it is "chosen" by the other three. Therefore, in this sample dataset of four cases, the number of degrees of freedom equals three. In the chi-square statistic, the data are free to vary by column and by row.)

To say that the two variables are related, the $\chi 2$ you calculate must be as large as or larger than a specific **critical value** which is obtained from a chi-square table and is dependent on the df for your table and the level of statistical significance you have chosen (usually .05). In our example, with df = 3 and a significance level of .05, the critical value is 7.82. Therefore, as 6.667 is less than 7.82, we would conclude that there is no relationship between sex and educational level.

Exercise 8 - Given the table below, determine row, column, and grand totals, then calculate a $\chi 2$. Are variables A and B related?

Variable B

Variable A			
	10	30	40
	5	20	25
	25	10	35
	40	60	100

The SPSS/PC+ CROSSTABS procedure can be used to calculate a chi-square for a contingency table. For the table in Exercise 2, the command would be as follows:

CROSSTABS TABLES=VARA BY VARB/STATISTICS 1.

The first variables specified becomes the row variable and the second the column variable. Statistics 1 indicates that a chi-square should be calculated. SPSS/PC+ does not tell

you the critical value, instead it tells you the exact probability associated with the chi-square for the table. If this probability is equal to or less than the significance level you have chosen (.05, for example), the chi-square is significant and the two variables are related.

It is often useful to request three of the options associated with the CROSSTABS procedure in SPSS/PC+. Options 3,4, and 5, produce row, column, and total percentages, respectively, for each cell in the table. Sometimes it is easier to understand the results of the chi-square test by looking at these percentages than it is to look just at the frequencies. Rewriting the SPSS/PC+ command shown above with this in mind, we get

```
CROSSTABS TABLES=VARA BY VARB/OPTIONS 3 4 5/STATISTICS 1.
```

Exercise 9 - Using the TEACH.SYS file, do a CROSSTABS do see if the SEX and AGEGRP variables are related. Use both the OPTIONS and STATISTICS commands.

If you examine the output from Exercise 3, you will see that the chi-square for the table constructed is 4.826 with 4 degrees of freedom. There is a column marked "Significance." This column gives the probability (chance) that one could obtain the reported chi-square if the two variables under investigation were, indeed, independent of each other, given the indicated degrees of freedom. In other words, there is a probability of 30.56% that a chi-square of 4.826 with 4 degrees of freedom could have resulted from chance if SEX and AGEGRP were truly unrelated to each other. The question now becomes "Is this probability small enough for us to conclude that it could not have occured if the two variables were unrelated, but rather, could only have occured if the two variables were related?" Convention in the social sciences is to say that if the probability is .05 (5%) or less, then we conclude that the two variables are related. In other words, we say that the calculated chi-square is statistically significant at the .05 level of significance. This means that there is less than 5 chances in 100 that we will say the two variables are related, when, in truth, they are not.

One should also look at the column labeled "Cells with E.F.< 5." The E.F. stands for Expected Frequency and if too many of the cells in the table have expected frequencies less than 5, the chi-square statistic is no longer reliable. A good "rule of thumb" is that if more than 20% of the cells have expected frequencies less than 5, the chi-square statistic should not be trusted. One way to get around this problem is to reduce the number of cells in the table by combining some of the categories in one or both of the variables and recompute the chi-square using this new table.

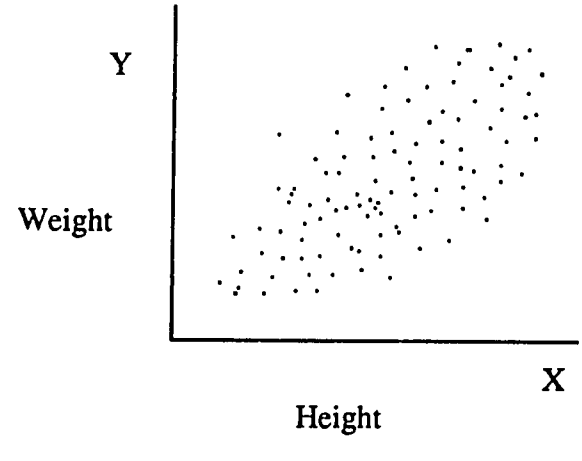
If the chi-square turns out to be significant, one must then examine the table in an attempt to figure out what is leading to this significance. This is done by examining the row

or column percentages (which are calculated by using OPTIONS 3 and 4 in SPSS/PC+) in each cell. If the chi-square is nonsignificant, it means that as we go across the columns, the row percentages remain very similar as we go from one row to the next. Or, if you prefer, as we go down the rows, the column percentages remain very similar as we go from one column to the next. For example, in the SEX by AGEGRP table produced in Exercise 9 the chi-square statistics was nonsignificant. If you look at the column percentages for the first column they are 25.0 for the first row (Males) and 75.0 for the second row (Females). A similar pattern is observed in the second column (21.9 vs 78.1), the third column (28.9 vs 71.1), and the fifth column (25.0 vs 75.0). The fourth column is the only one that doesn't follow this pattern (50.0 vs 50.0) and even this difference is not enough to cause the chi-square to be significant. The more discrepant these percentages become, the larger the chi-square will become until, at some point, the discrepancies will become so great the chi-square will attain statistical significance.

Correlation

In the previous section we discussed the chi-square statistic and how it could be used to test to see if two categorical variables were related to one another. A similar statistic exists for continuous variables. Correlation allows us to investigate the direction and strength of the relationship between two continuous variables. We shall confine our attention to one type of correlation coefficient, the **Pearson Product-Moment correlation coefficient.**

The Pearson Product-Moment correlation coefficient (denoted as r) assesses the direction and strength and direction of the linear relationship between two variables. Say, for example, we wish to discover whether for a sample of adult Yemeni males, height in centimeters (X) is related to weight in kilograms (Y). Each person in the sample, then, has a height and a weight. If we graph these data points, we will produce what is called a **scatterplot** and it will look something like this:



If we draw an ellipse around these points, we will be able to say something about the direction and magnitude of the relationship between height and weight. If, by looking left to right, the ellipse goes from lower left to upper right (as is the case in the above example), the relationship is said to be a positive or direct relationship — as one variable increases, the other increases; as one variable decreases, the other decreases. If, on the other hand, the ellipse goes from upper left to lower right, the relationship is said to be negative or inverse. If the ellipse is very thin, the relationship between the two variables is strong. If the ellipse becomes a straight line, the relationship is said to be perfect and is the strongest it can be. If, however, the ellipse is thick, the relationship is a weak one and if the ellipse becomes a circle, no linear relationship exists between the two variables.

The Pearson Product-Moment Correlation Coefficient quantifies the direction and strength of the (linear) relationship. It varies between -1.0 and +1.0 with either -1.0 or +1.0 signifying a perfect relationship and 0.0 signifying no relationship. It is calculated as follows:

$$r_{xy} = \frac{\frac{\Sigma (X_i * Y_j)}{n} - (\overline{X} * \overline{Y})}{s_x * s_y}$$

Let us take the following set of height and weight data with X representing the height and Y representing the weight. In order to calculate the correlation, we need the means for X and Y, the standard deviation for X and Y, and the sum of the XY's, which is called "the sum of the cross products."

X	176	140	196	150	180
Y	61	50	82	55	60

$$XY = (176)(61) + (140)(50) + (196)(82) + (150)(55) + (180)(60) = 52858$$

$$r_{xy} = \frac{\frac{52858}{5} - (168.4)(61.6)}{(20.49)(10.93)} = \frac{10571.6 - 10373.44}{223.9557}$$

$$= +0.88$$

The correlation between height and weight for our sample of adult Yemeni males, then, is +0.88, which indicates a strong, positive linear relationship between the two variables.

Exercise 10 - Find the correlation between X and Y for the following set of data:

X	20	30	23	27	23	15	30	20
Y	13	27	22	23	24	17	29	20

Exercise 11 - The Pearson correlation can easily be calculated using the CORRELATION procedure in SPSS/PC+. Using the TEACH.SYS file, find the correlation between AGE and Q1 (Request OPTIONS 5 and STATISTICS 1 as well).

Choosing OPTIONS 5 causes SPSS/PC+ to print two additional pieces of information besides the requested correlation. The number enclosed within parentheses is the number of cases on which the correlation is based. The "P= " portion refers to the probability of obtaining that particular correlation coefficient if the "true" correlation between the two variables is equal to zero. In other words, it is the probability of obtaining that correlation coefficient by chance alone assuming the two variables are really uncorrelated with each other. As was the case for the chi-square statistic we discussed above, if this probability is less than or equal to 0.05, we conclude that the reported correlation is significantly different from zero. Or to put it another way, we conclude that the two variables are, indeed, correlated with each other.

It is important to note that just because a correlation is close to zero, it does not mean the two variables are not related to each other. Remember, the Pearson Product-Moment correlation measures the degree of linear relationship between two variables. If the variables are related in a nonlinear or curvilinear fashion, the Pearson correlation will be close to zero. For example, performance on a test and anxiety level are related to each other. As anxiety level increases, subjects tend to do better on the test (perhaps a little anxiety prods them to study more and to pay closer attention to their work). However, once anxiety level reaches a certain threshold, it becomes counterproductive. It begins to interfere with performance and test scores go down. This is not a straight line or linear relationship, rather the graph looks something like an upside down letter "U," indicating

a curvilinear relationship between test score and anxiety. One must be careful about interpreting correlation coefficients without first examining the scatterplots.

Examining the scatterplots also allows a researcher to detect the presence of outliers. Outliers are data points that fall outside the range of the majority of the data. Outliers can have a profound impact on the Pearson correlation. It is possible that the presence of a few outliers will cause two variables that appear for the most part to be unrelated to have a correlation coefficient that is significantly different from zero. The reverse can also occur where two variables that are highly related can appear to be almost totally unrelated due to the presence of only a small number of outliers.

LOTUS EXERCISES

LOTUS EXERCISES

These exercises are designed to be used along with a Lotus 1•2•3™ manual. This section is only a summary introduction, via exercises, to Lotus™.

Exercise 1

In this exercise you are required to start making part of Table 1 using the Lotus™ spreadsheet by following these steps:

NOTE: Throughout these exercises, the symbols < > will be used as a short form of **[Enter]**, as they are in the rest of the manual.

Steps:

1 - To get access to the spreadsheet,

- type: **123**

2 - Move the cell pointer (CP) to cell d2 and type: **Table (1)** and press: < >

3 - Move the CP to cell a4 and type the heading of the Table and press: < >

4 - Move the CP to cell a7 and type: **Code** and press: < >

5 - Move the CP to cell b7 and type: **Occupation** and press: < >

6 - Move the CP to cell d7 and type: **Yemeni** and press: < >

7 - Move the CP to cell e7 and type: **non-Yemeni** and press: < >

8 - Move the CP to cell f7 and type: **Total** and press: < >

9 - Move the CP to cell g7 and type: **% non-Yem** and press: < >

10 - Follow steps 4 to 7 with the appropriate CP change to enter the code, occupation, number of Yemenis, and number of non-Yemenis starting from line 9, so the table will look like the following:

Table 1

Public Sector Employment by Nationality and Occupation in 1986

Code	Occupation	Yemeni	non-Yemeni	Total	% non-Yem
010	Phys Sci & rel	146	26		
020	Engi & Archit	578	165		
050	Life Scient	152	43		
060	Doctors & Pharm	935	885		
080	Stat, Math, Comp	113	9		
090	Economists	353	5		
110	Accountants	1903	100		
120	Lawyers, Judges	797	10		
130	Teachers (Inter,Se)	5400	6770		
140	Workers in Religion	845	85		
150	Authors, Journ	230	1		
190	Social Workers	316	20		
199	Other Professions	872	40		
	Total Prof. Occ				

11 - To save your table on the disk in the A drive,

- press: / **File Save < >**
- press: **Esc**

12 - Give the table a name,

- type: **A:table1 < >**

13 - To exit from Lotus™:

- press: / to get to the menu
- choose **Quit** by pre .sing **Q**

Lotus™ will ask you if you have saved your work, and since you did in step 12:

•press: **Y**

Exercise 2

In this exercise you are required to use Lotus™ to add the total of Yemeni and non-Yemeni workers in Table 1 and derive the percentage of the Yemenis to the row total by following these steps:

Steps:

1 - To get access to the spreadsheet:

- type: **123**

2 - To retrieve your table,

- press: / to get to the menu
- choose **File** by pressing **F**
- choose **Retrieve** by pressing **R**
- press: **Esc**
- now type: **A:table1.wk1**

3 - To get the total for the first occupation, move the CP to cell f9 under the word **Total** and type this formula:

d9+e9 and press: **< >**

4 - To get the total for the following occupation you can copy the formula of the first occupation:

- move CP to cell f9
- press: / to get to the menu
- choose **Copy** by pressing **C**, **< >**
- move the CP to cell f10, **< >**

5 - Follow step 3 to obtain the totals of the other occupations with the appropriate changes in cell numbers.

6 - To get the total for the Yemeni workers in the first column, move the CP to cell d22 at the end of the column and type this formula:

@sum(d9.d21) and press: **< >**

7 - To get the total for the non-Yemenis you can copy the formula of the the first column,

- move the CP to cell f9
- press: / to get to the menu
- choose **Copy** by pressing C, < >
- move the CP to cell f10, < >

8 - Follow step 7 to obtain the total of the other column with the appropriate changes in cell numbers.

9 - To get the percentage of non-Yemeni workers to the total for the first occupation, move the CP to cell g9 under the column heading **% non-Yem** and type this formula:

+e9/f9*100 and press: < >

10 - To get the percentage of the following occupation you can copy the formula of the first occupation:

- move the CP to cell g9
- press: / to get to the menu
- choose **Copy** by pressing C, < >
- move the CP to cell g10, < >

11 - Follow step 10 to obtain the percentages of the other occupations with the appropriate changes in cell numbers.

12 - When finishing the totals and percentages the table will look like the following:

Table 1

Public Sector Employment by Nationality and Occupation in 1986

Code	Occupation	Yemeni	non-Yemeni	Total	% non-Yem
010	Phys Sci & rel	146	26	174	15
020	Engi & Archit	578	165	743	22
050	Life Scient	152	43	195	22
060	Doctors & Pharm	935	885	1820	49
080	Stat, Math, Comp	113	9	122	7
090	Economists	353	5	358	1
110	Accountants	1903	100	2003	5
120	Lawyers, Judges	797	10	807	1
130	Teachers (Inter,Se)	5400	6770	12170	56
140	Workers in Religion	845	85	930	9
150	Authors, Journ	230	1	231	0
190	Social Workers	316	20	336	6
199	Other Professions	872	40	912	4
	Total Prof. Occ	12642	8159	20801	39

13 - To save your table on the disk in the A drive,

• press: / **File Save Esc**

14 - Since you have saved your table, now Lotus™ will ask you if you want to replace it or cancel the command, in this case we want to replace, so:

• press: **R**

15 - To exit from Lotus™:

• press: / to get to the menu

• choose **Quit** by pressing **Q**

Lotus™ will ask you if you have saved your work, and since you did in step 12,

• press: **Y**

Exercise 3

In this exercise you are required to insert and delete rows and columns from the table you did in the previous Exercise using the Lotus™ spreadsheet by following these steps:

Steps:

1 - To get access to the spreadsheet,

- type: **123**

2 - To retrieve your table,

- press: / for the menu
- choose **File** by pressing **F**
- choose **Retrieve** by pressing **R**
- press: **Esc**
- type: **A:table1.wk1**

3 - Insert a row between the first and second occupation, line 9 and 10. Move the CP to any cell in line 10 (choose cell a10). Then:

- press: / for the menu
- choose **Worksheet** by pressing **W**
- choose **Insert** by pressing **I**
- choose **Row** by pressing **R**
- press: **< >**

4 - Insert a line between the rest of the occupations by following the above steps with respective changes in cell numbers.

5 - After inserting the lines the table will look like this:

Table 1

Public Sector Employment by Nationality and Occupation in 1986

Code	Occupation	Yemeni	non-Yemeni	Total	% non-Yem
010	Phys Sci & rel	146	26	174	15
020	Engi & Archit	578	165	743	22
050	Life Scient	152	43	195	22
060	Doctors & Pharm	935	885	1820	49
080	Stat, Math, Comp	113	9	122	7
090	Economists	353	5	358	1
110	Accountants	1903	100	2003	5
120	Lawyers, Judges	797	10	807	1
130	Teachers (Inter,Se)	5400	6770	12170	56
140	Workers in Religion	845	85	930	9
150	Authors, Journ	230	1	231	0
190	Social Workers	316	20	336	6
199	Other Professions	872	40	912	4
	Total Prof. Occ	12642	8159	20801	39

6 - Now delete the rows inserted in the table by reversing the process. Move the CP to any cell in the line you want to delete (choose cell a10).

- press: / to get the menu
- choose **Worksheet** by pressing **W**
- choose **Delete** by pressing **D**
- choose **Row** by pressing **R**, < >

7 - Delete the rest of the inserted lines between the occupations by following the above steps with the appropriate changes in cell numbers.

8 - After deleting the lines the table will look like the original one without the inserted lines.

9 - Insert one column between the **Total** and **% non-Yem** columns:

- move the CP to column i (**% non-Yem**)
- press: / to get to the menu
- choose **Worksheet** by pressing **W**
- choose **Insert** by pressing **I**
- choose **Column** by pressing **C**, < >

10 - Delete the column you inserted between the **Total** and **% non-Yem** columns: move the CP to the empty column before the % non-Yem column.

- press: / to get to the menu
- choose **Worksheet** by pressing **W**
- choose **Delete** by pressing **D**
- choose **Column** by pressing **C**, < >

11 - After deleting the column, the table will look like the original one without the inserted column.

12 - Make the percentage of non-Yemeni workers in the last column 4 digits after the decimal point by typing:

- press: / to get to the menu
- choose **Range** and press: < >
- choose **Format** and press: < >
- choose **Fixed** and press: < >
- type **4** and press: < >

  Define the range of the last column by typing the addresses of the top cell and the bottom cell, and press: < >

13 - Print Table 1 by giving the following commands:

- press / to get to the menu
- choose **Print** and press: < >
- choose **Printer** and press: < >
- choose **Range** and define the range of the table by typing the top left cell address and the bottom right cell address and press: < >
- choose **Go** and press: < >

Exercise 4

In this exercise you are required to continue to add to the table other groups of occupations. You need to add the labels of the additional occupations and enter their data for only Yemeni and non-Yemeni workers.

1) Use Lotus™ to derive the total workers (Yemeni and non-Yemeni) and the percentage of the non-Yemeni workers to the Total.

2) Derive also the sub-totals of the occupation groups as they are classified in Table 1 below.

The data and labels you need to enter are found in the same table. Follow the same procedures and steps outlined in previous exercises.

Table 1

Public Sector Employment by Nationality and Occupation in 1986

Code	Occupation	Yemeni	non-Yemeni	Total	% non-Yem
010	Phys Sci & rel	146	26	174	15
020	Engi & Archit	578	165	743	22
050	Life Scient	152	43	195	22
060	Doctors & Pharm	935	885	1820	49
080	Stat, Math, Comp	113	9	122	7
090	Economists	353	5	358	1
110	Accountants	1903	100	2003	5
120	Lawyers, Judges	797	10	807	1
130	Teachers (Inter,Se)	5400	6770	12170	56
140	Workers in Religion	845	85	930	9
150	Authors, Journ	230	1	231	0
190	Social Workers	316	20	336	6
199	Other Professions	872	40	912	4
	Total Prof. Occ.	12642	8159	20801	39
200	Gov Adm, Legis	309	0	309	0
210	Gen Mang, oth Mang	2149	18	2167	1
	Total Adm. Occ.	2458	18	2476	1
133	Teachers (Primary)	7068	14318	21386	67
055	Phys Scie Tech	135	0	135	0
025	Engineering Tech	1731	147	1878	8
065	Life Scie Tech	2053	1238	3291	38
066	Life Scie Assist.	1974	227	2201	10
140	Aircr, Pilt. Tech	109	8	117	7
185	Assist. Accountant	222	0	222	0
	Total Tech & Asst	13292	15938	29230	55
300	Exec Officials	1334	11	1345	1
310	Supvr. Clrcl. Wrks	306	0	306	0
320	Typists, Steno	1501	61	1562	4
330	Bookkp. Cashiers	4972	30	5002	1
350	Transp. Comm. Supv	373	4	377	1
360	Transp. Conductors	14	0	14	0
370	Mail Dist. Clerks	1189	10	1199	1
380	Teleph, Teleg. Oper	98	13	111	12
390	Clerks	6951	25	6976	0
	Total Exec & Cleri	16738	154	16892	1

420	Sales Supervisors	42	0	42	0
450	Sales, shop Asst.	114	0	114	0
490	Other Sales Occ.	10	9	19	47
	Total Sales Occ.	166	9	175	5
500	Mang. Rest.	23	4	27	15
520	Housekp. relt. Wor	38	4	42	10
530	Cooks, relt.	522	66	588	11
540	Support Service Wr	71	0	71	0
550	Buildings caretake	7651	26	7677	0
580	Guards	1444	0	1444	0
580	Fire Fighters	178	0	178	0
590	Other Service Occ.	62	1	63	2
	Total Service Occ	9989	101	10090	1
600	Farm Mang, Supr	1	1	2	50
612	Specialized Farmer	170	0	170	0
620	Agric. Workers	246	7	253	3
	Total Agr. Occ	417	8	425	2
789	Prod. Relt. Wrkrs	4678	34	4692	1
999	Unskilled Wrkers	6803	75	6878	1
	All Occupations	67163	24496	91659	27

Exercise 5

Add a new column at the end of Table 1 using Lotus™ spreadsheet commands and calculate in that column the percentage of Yemeni workers to the total workers for every occupation. Follow the same procedures and steps outlined in previous exercises. The table will look like the following:

Table 1

Public Sector Employment by Nationality and Occupation in 1986

Code	Occupation	Yemeni	non-Yemeni	Total	% non-Yem	Yemeni
010	Phys Sci & rel	146	26	174	15	85
020	Engi & Archit	578	165	743	22	78
050	Life Scient	152	43	195	22	78
060	Doctors & Pharm	935	885	1820	49	51
080	Stat, Math, Comp	113	9	122	7	93
090	Economists	353	5	358	1	99
110	Accountants	1903	100	2003	5	95
120	Lawyers, Judges	797	10	807	1	99
130	Teachers (Inter,Se)	5400	6770	12170	56	44
140	Workers in Religion	845	85	930	9	91
150	Authors, Journ	230	1	231	0	100
190	Social Workers	316	20	336	6	94
199	Other Professions	872	40	912	4	96
	Total Prof. Occ.	12642	8159	20801	39	61
200	Gov Adm, Legis	309	0	309	0	100
210	Gen Mang, oth Mang	2149	18	2167	1	99
	Total Adm. Occ.	2458	18	2476	1	99
133	Teachers (Primary)	7068	14318	21386	67	33
055	Phys Scie Tech	135	0	135	0	100
025	Engineering Tech	1731	147	1878	8	92
065	Life Scie Tech	2053	1238	3291	38	62
066	Life Scie Assist.	1974	227	2201	10	90
140	Aircr, Pilt. Tech	109	8	117	7	93
185	Assist. Accountant	222	0	222	0	100
	Total Tech & Asst	13292	15938	29230	55	45
300	Exec Officials	1334	11	1345	1	99
310	Supvr. Clrcl. Wrks	306	0	306	0	100
320	Typists, Steno	1501	61	1562	4	96
330	Bookkp. Cashiers	4972	30	5002	1	99
350	Transp. Comm. Supv	373	4	377	1	99
360	Transp. Conductors	14	0	14	0	100
370	Mail Dist. Clerks	1189	10	1199	1	99
380	Teleph, Teleg. Oper	98	13	111	12	88
390	Clerks	6951	25	6976	0	100
	Total Exec & Cleri	16738	154	16892	1	99

420	Sales Supervisors	42	0	42	0	100
450	Sales, shop Asst.	114	0	114	0	100
490	Other Sales Occ.	10	9	19	47	53
	Total Sales Occ.	166	9	175	5	95
500	Mang. Rest.	23	4	27	15	85
520	Housekp. relt. Wor	38	4	42	10	90
530	Cooks, relt.	522	66	588	11	89
540	Support Service Wr	71	0	71	0	100
550	Buildings caretake	7651	26	7677	0	100
580	Guards	1444	0	1444	0	100
580	Fire Fighters	178	0	178	0	100
590	Other Service Occ.	62	1	63	2	98
	Total Service Occ	9989	101	10090	1	99
600	Farm Mang, Supr	1	1	2	50	50
612	Specialized Farmer	170	0	170	0	100
620	Agric. Workers	246	7	253	3	97
	Total Agr. Occ	417	8	425	2	98
789	Prod. Relt. Wrkrs	4678	34	4692	1	99
999	Unskilled Wrkers	6803	75	6878	1	99
	All Occupations	67163	24496	91659	27	73

Source: Manpower, Table No. 3, CPO

LABOR FORCE AND MANPOWER GLOSSARY

Active Employment Policy

سياسة العماله الفعاله

Measures which effect labor as a factor in production.

الاجراءات التي تؤثر على العمل كعنصر من عناصر الانتاج

Active Labor Force

القوى العامله الفعاله

(See Economically active population.)

(إنظر السكان النشطين إقتصادياً)

Activity Rate

معدل النشاط

(See Labor Force Participation Rate.)

(إنظر معدل نشاط القوى العامله)

Adult Education

تعليم الكبار

Education for adult (grown up) people, generally in ages after school age.

التعليم للكبار من السكان، ويشمل عادة الأعمار بعد سن التعليم.

Apprentice

المتمرن

Apprentice refers to a status of an occupation. It implies that the worker is in a learning status regarding the functions of the occupation and, as a rule, has entered into a formal agreement with his employer.

يشير المتمرن إلى حالة معينة من المهنه "الوظيفه"، ويعني ان العامل يتعلم مهام الوظيفه بالاتفاق مع رئيس العمل.

Apprenticeship

مدة التمرين

Apprenticeship is the period of being an apprentice or the status of working as an apprentice (see Apprentice).

الفترة التي يقضيها المتمرن كونه تحت التمرين

Artisan

Skilled workman or craftsman in industry or trade.

عامل ماهر او حرفي يعمل في الصناعة او الحرف .

Automation

الآلية

Use of machinery to save manual labor.

استخدام الآلات لتوفير العمل اليدوي

Background

الخلفية

A person's cultural knowledge, education and experience.

خبرة الشخص و ثقافته العلمية والثقافية

Budget

الميزانية

Estimate of probable future income and expenditure; manpower budget is estimated supply and requirements of manpower in a future period (e.g., Fourth Plan Period).

تقديرات الدخل والانفاق في المستقبل وميزانية القوى العاملة هي الموازنة بين العرض والطلب من القوى العاملة خلال فترة زمنية معينة

Business

العمل

Buying and selling (i.e., commerce), or commercial enterprise or shop.

البيع والشراء (التجارة) او عمل تجاري او محل تجاري

Buyers Market

سوق البائعين

Condition where supply exceeds demand and prices are low.

يكون في حالة زيادة العرض على الطلب وانخفاض الأسعار .

By-product

المنتج الفرعي

Substance obtained during the manufacture of some other substance.

المادة التي تنتج خلال تصنيع مادة أخرى.

Capital Coefficient

معامل رأس المال

(See Capital-output Ratio.)

(انظر نسبة رأس المال إلى الانتاج)

Capital-intensive

الاسلوب الكثيف لرأس المال

Input use of much greater capital than labor per produced unit.

هو الذي يستخدم رأس المال بنسبة أكثر من العمل لكل وحدة منتجة

Capital-output Ratio

نسبة رأس المال إلى الانتاج

Relation of capital required to increase output by one unit per annum, adapted to one sector of economy or the national economy as a whole.

الاحتياجات من رأس المال لانتاج وحدة واحدة من الانتاج خلال سنة في قطاع معين او في كافة القطاعات

Civil Servant

الموظف المدني

Government employee.

الشخص الذي يعمل في الحكومة

Civil Service

الخدمة المدنية

All government departments except the Navy, Army, and Air Force.

كافة الادارات والمؤسسات الحكومية عدا المؤسسات العسكرية .

Classification of Economically Inactive Population

تصنيف السكان غير النشطين إقتصاديا :

Classification recommended by the United Nations by: (1) homemakers (housewives and other relatives); (2) students; (3) persons in institutions; (4) income recipients; and (5) others.

التصنيف الذي اوصت الامم المتحدة به :
١- ربات البيوت ٢- الطلاب ٣- المسجونين
٤- الاشخاص الذين يعيشون على دخل مستمر
٥- آخرون .

Classification by Status

التصنيف حسب الحالة :

Classifying workers according to whether the individual is an employer or employee. Also another meaning of classifying workers according to whether at a given time the individual is employed or unemployed.

تصنيف العاملين حسب كون الشخص مستخدماً او يعمل لحسابه ، ويعني أيضاً في بعض الحالات تصنيف العمال في وقت معين فيما إذا هم مستخدمون او عاطلون .

Classification of Type of Employment Status

التصنيف حسب نوع الحالة الوظيفية :

In general a classification into four categories: (1) own account workers; (2) employer; (3) employee; and (4) unpaid family worker. (These four categories are recommended by ILO.) Classification of Type of Enterprise. In general a classification of enterprises into small-scale or large-scale enterprises, and public or private enterprises, sometimes also semipublic or other indications (as recommended by ILO).

اوصت منظمة العمل الدولية بتصنيف العمال الى اربع مجموعات: ١) المشتغلون لحسابهم ، ٢) الموظفين ، ٣) الموظفين ، ٤) العاملون بدون أجر . وتوصي المنظمة بتصنيف المؤسسات المنتجة حسب الحجم الى مؤسسات صغيرة واخرى كبيرة ، وحسب ملكيتها الى حكومية واهلية (خاصة) وتضاف احياناً مجموعات أخرى هي المؤسسات شبه الحكومية .

Collective Bargaining

المفاوضات الجماعية :

Negotiations for collective contracts between employers and workers on wages and conditions of work.

وهي المفاوضات التي تتم بين رؤساء العمل والعمال حول تنظيم الاجور وظروف العمل .

Collective Contracts

العقود الجماعية

Employment contract concluded after collective bargaining between employers and workers organizations.

وهي العقود التي تتم بين مؤسسات العمل والعمال بعد عقد المفاوضات الجماعية .

Commerce

التجارة

Exchange and distribution of goods.

وهي تبادل وتوزيع السلع والخدمات .

Commercial Education

التعليم التجاري

Vocational training and education of workers and professionals for commercial occupations.

التدريب المهني والتعليم الذي يستهدف إعداد العمال للمهن التجارية .

Comprehensive School

المدرسة الشاملة

Large school that combines all types of secondary education (i.e., grammar school, secondary modern, and technical) for all children of a district.

وهي المدرسة التي تحتوي على كافة انواع التعليم الثانوي (ثانوية عامة، فنية، الخ)

Consumer Price Indices

مقاييس أسعار الاستهلاك

Measurements of changes in the cost-of-living at different periods.

مقاييس التغيرات الحاصلة في تكاليف المعيشة خلال فترات زمنية معينة .

Consumption

الاستهلاك

Using up, (consuming) of food, energy and materials and also the quantity consumed.

إستخدام او استهلاك السلع الغذائية والطاقة والمواد الأخرى

Counter-inflatory Policy

السياسات ضد التضخم الاقتصادي

Policy to reduce the level of economic activity, using such measures as tighter credit, dearer money, or limited public expenditure.

وهي التي تستهدف تقليص النشاط الاقتصادي باتباع وسائل معينة كتحديد سياسات الائتمان وتحديد عرض النقود او المصروفات الحكومية .

Cyclical Unemployment

البطالة الدورية :

Unemployment due to contraction of the economic activity caused by cyclical changes or recession of the economy.

هي البطالة الناتجة عن الانكماش الاقتصادي الناتج عن التغيرات الدورية في الاقتصاد .

Demographic Data

البيانات السكانية

Statistics on population, births, deaths, immigration, growth, etc.

الإحصاءات عن السكان، المواليد، الوفيات، الهجرة، النمو، إلخ.

Denationalize (privatisation)

تقليص القطاع العام

Transfer a nationalized industry to private ownership again.

يتم عند تحويل ملكية الصناعات من القطاع العام إلى القطاع الخاص.

Density of Population

الكثافة السكانية

Number of persons living within a square kilometer.

عدد السكان الموجودين في كل كيلومتر مربع.

Dependent

التابع

As person who depends upon another for a home, food, etc.

الشخص الذي يعتمد في معيشته على شخص آخر.

Depopulation

تقليص السكان

Lessening the number of people living in a place, a region, or a country.

تقليل عدد السكان في مكان، منطقة، أو بلد ما.

Depressed Areas

المناطق المتخلفة

Areas of country with a less developed economic structure.

وهي المناطق ذات التركيب الاقتصادي الأقل تطوراً.

Depression

الانكماش

A period when business and economic activity are slackening, very often resulting in unemployment.

وهي الفترة التي تنكمش فيها الأعمال والفعاليات الاقتصادية تتسبب في إنتشار البطالة.

Dismissal

الفصل :

Ending of employment by action from the employer.

وتعني إنهاء عمل الموظف من وظيفته

Displacement

سياسة التبديل

Changing from one method to another, or in labor market policy, displacement is used in the sense of displacement of human labor by machines (automation).

وتعني تغيير الطريقة المتبعة، وفي سياسة العمل تعني تبديل العنصر البشري بالآلات.

Economy

الاقتصاد.

Control and management of the money, goods, and other resources of a community, society of household.

يعني السيطرة وإدارة الموارد المالية والسلع وغيرها في بيئة، مجتمع، أو عائلة معينة.

Economically Active Population

السكان النشطين إقتصادياً

The part of the population which is actually working.

الجزء من السكان الذين يعملون فعلاً.

Employment Agency

وكالة الاستخدام "التوظيف"

Business establishment which helps persons to find employment.

المؤسسة التي تساعد الأشخاص في الحصول على وظيفة أو عمل.

Employment Market Analysis

تحليل سوق العمل:

Analysis of supply and demand of manpower.

تحليل الطلب والعرض على القوى العاملة.

Excess Demand

فائض الطلب

Instances where the demand for labor is higher than the supply of labor.

في هذه الحالة يكون الطلب على القوى العاملة أكثر من العرض.

Fertility

الخصوبة

Children born alive.

المواليد الذين يولدون أحياء .

Foreman

رئيس "كبير" عمال

The foreman is normally a craftsman or other specialized worker who has been given additional duties. There are two main types of foremen, namely: a) those who work with a group of workers performing particular functions and who themselves carry out some of the duties in addition to exercising supervision, assigning work, and coordinating the efforts of the group, and b) those who do not as a rule perform any of the work themselves but carry out the other duties of foremen described in a), sometimes supervising workers in more than one occupation.

كبير العمال هو عامل حرفي او عامل متخصص يعطى مهاما إضافية . وهناك نوعين من رؤساء العمال : ا) هؤلاء الذين يعملون مع العمال في تأدية المهام بالاضافه الى اعمال الاشراف، توزيع المهام ، وتنسيق الجهود ، ب) هؤلاء الذين يمارسون المهام الاشرافيه فقط ، واحيانا يشرفون على اكثر من وحدة او وظيفه واحدة .

Frequency

التكرار

Rate of occurrence in statistics.

معدل تكرار المشاهدات في علم الاحصاء.

Full Employment

العماله الكامله

Labor force is employed on such a high level as turnover and practical arrangements permit. The policy of full employment is accepted as a guideline in many countries.

هي الحاله التي يكون فيها كافة العاملين يعملون باعلى الدرجات التي يسمح بها معدل دوران العمل او الحالات العمليه. اكثر دول العالم تضع العماله الكامله كهدف من اهداف التنمية .

Household Unit

الوحدة العائلية :

A household unit consists, as a rule, of persons who share a dwelling and have a common economy.

مصطلح إحصائي يعني كافة الاشخاص الذين يتشاركون في السكن والمصروفات .

Human Investment

استثمار العنصر البشري

Training and education of labor.

تدريب وتعليم عنصر العمل .

Industrial Classification

التصنيف الاقتصادي

Classifying workers according to the economic activity in which the work is performed.

تصنيف العاملين حسب النشاط الاقتصادي في المؤسسات التي يعملون بها .

In-Plant Training

التدريب داخل المؤسسة

Vocational training organized in an establishment; also on-the-job training.

تدريب مهني ينظم داخل المؤسسة او التدريب اثناء العمل .

Investment

الاستثمار

Pushing money into an economic activity in an establishment, such as new machines, (investing in capital) or for vocational training for workers (investing in labor).

إستثمار الاموال في الفعاليات الاقتصادية داخل المؤسسة كشراء الماكنة والآلات (إستثمار رأس المال) او تدريب العاملين (إستثمار في العمل) .

Investment Plan

خطة الاستثمار

A plan which includes the projects planned for investment in the economic plan.

خطة تشمل مشاريع الاستثمار ضمن خطة التنمية الشاملة .

Job Seeker

الباحث عن عمل

A person actively seeking work through such means as registering at a placement office, answering advertisements of job vacancies, or visiting employers asking for work.

الشخص الذي يبحث عن عمل عن طريق مكاتب التوظيف ، الاستجابة للاعلانات عن وظائف شاغرة ، او التقدم الى رؤساء العمل لطلب التوظيف .

Labor Coefficient

معامل العمل :

(See Labor-output Ratio.)

(انظر نسبة العمل للناتج)

Labor Force

قوة العمل

The part of the population which is economically active as well as the unemployed who are seeking work.

الجزء من السكان الذين يعملون، وتشمل ايضا الجزء الذين لا يعملون لكنهم يبحثون عن عمل.

Labor Force Data

بيانات قوة العمل

Distribution of labor force by age, sex, employment status, branch of activity, education and other relevant characteristics and trends.

توزيع القوى العاملة حسب النوع، العمر، الحالة الوظيفية، نوع النشاط، المؤهل العلمي وبعض الخصائص الاخرى.

Labor Force Participation Rate

معدل مشاركة القوى العاملة

The crude LFPR is the number of the labor force divided by the number in the total population. The age specific LFPR is the number in a labor force in a certain age group divided by the population of that age group. Crude and age specific ratios are derived for males, females, and total population.

إن معدل المشاركة الخام هو قسمة القوى العاملة على مجموع السكان. اما معدل المشاركة حسب العمر فهو قسمة عدد القوى العاملة في فئة عمرية على عدد السكان في ذلك العمر. ويستخرج معدل المشاركة الخام وحسب العمر للذكور والاناث ولمجموع السكان

Labor Force Reserve

إحتياطي القوى العاملة:

Those persons who are outside the labor force, but who can easily be mobilized if certain conditions are met. One category is married women, who often can enter the labor force if they can find someone to look after the children. Underemployed people are include in the labor force reserve.

الاشخاص الذين يكونون خارج القوى العاملة ويمكنهم دخولها إذا تحققت ظروف معينة؛ مثل النساء المتزوجات حيث يمكنه ان يدخلن قوة العمل اذا توفرت لهن العناية على من يهتم باطفالهن. ويعتبر الاشخاص غير المستخدمين من ضمن إحتياطي القوى العاملة.

Labor Force Sample Surveys

A study of the labor force by sample, i.e., a part of the population is chosen and studied regarding employment and other characteristics of interest for economic planning and labor market policy. The sample is chosen to represent the whole population (see Cross-section).

Labor-intensive

Use of much greater amount of labor (than of capital output) per unit produced.

Labor Market

Market where the supply and demand for labor meet and result in employment.

Labor Market Statistics

Statistics on labor market problems, workers, establishments, wages, worked hours, labor force, etc.

Labor-output Ratio

Number of workers employed in relation to production. The reciprocal of this formula is labor productivity (see Labor Productivity). L.O.R. is also called the labor coefficient.

Labor Productivity

Production divided by the number of workers.

Manpower

القوى العاملة

Number of people available for industrial labor needs.

عدد الاشخاص المتوافرين لسد إحتياجات العمل.

Manpower Planning

تخطيط القوى العاملة

Analysis and forecast of quantitative and qualitative aspects of the current and future manpower supply-demand situation.

التحليل النوعي والكمي للقوى العاملة الموجودة والمتوقعة لحالات الطلب والعرض من القوى العاملة.

Manpower Surplus Area

منطقة تتمتع بفائض من القوى العاملة،

Region with a surplus of labor (unemployed or underemployed).

هي المنطقة التي تتوفر بها فائض من القوى العاملة.

Manufacture

التصنيع

Making or production of goods and material.

إنتاج او صناعة السلع والمواد

Mobility of Labor

حركة العمل الجغرافية

Migration and movement of workers, from one area to another (geographic mobility).

إنتقال وهجرة العاملين من منطقة إلى أخرى.

National Accounts Data

بيانات الحسابات القومية

Rates of saving and investment, income or value added per worker by branch of activity, industry, or sector.

معدلات الاستثمار والادخار، الدخل او القيمة المضافة لكل عامل في فرع مؤسسة او قطاع

Occupation

المهنة "الوظيفة"

Business or trade; work.

طبيعة عمل الفرد، تجارة، او وظيفة

On-the-job Training

التدريب اثناء العمل:

Training of workers directly in production, (on-the-job) used as opposed to vocational training in schools.

تدريب العمال بصورة مباشرة اثناء اداتهم لاعمالهم، وهو يختلف عن التدريب المهني في المدارس.

Per Capita Income

حصة نصيب الفرد من الدخل القومي:

The national income divided by the number in the population.

حاصل قسمة الدخل القومي على عدد السكان خلال سنة معينة.

Population Census

الاحصاء السكاني:

Enumeration of the people in a country.

حصر عدد السكان في بلد ما خلال مدة زمنية معينة.

Productivity

الانتاجية

Units of Output: productivity is usually man-hours worked, measured by dividing output in physical units by man-hours worked.

متوسط ما ينتجه العامل الواحد، وتقاس بوحدات لكل ساعة عمل.

Profession

التخصص الوظيفي "المهنة"

Occupation requiring advanced education or special training, such as law, architecture, and medicine.

المهنة التي تتطلب تعليما عاليا او تدريبا خاصا كالقانون، الطب، الهندسة، المحاماة الخ.

Seasonal Employment

العمالة الموسمية.

Employment depending on conditions which do not allow for permanent work during the whole year; for example, agriculture in areas with climate impending cultivation during winter or dry periods.

العمالة التي تعمل خلال موسم معين من السنة كالعمالة في القطاع الزراعي في مواسم معينة كموسم الحصاد.

Underemployment

البطالة المقنعة

Inadequate utilization of available human resources and capacities. Underemployment can be identified by two broad types: (1) visible underemployment, which results from an insufficiency in the volume of employment opportunities, and (2) invisible underemployment, which occurs when there is a qualitative inadequacy in employment. The ILO definition of underemployment recognizes four types: (1) inadequate partial utilization of available work time; (2) skill underutilization; (3) abnormally low income; and (4) low productivity.

وتعني عدم استخدام الموارد والامكانات استخداماً جيداً، وهي نوعين: (١) بطالة مقنعة ظاهرة وتأتي نتيجة لعدم وجود فرص عمل كافية، (٢) بطالة مقنعة خفية الناتجة عن عدم استخدام القوى العاملة استخداماً جيداً. وتعرف منظمة العمل الدولية البطالة المقنعة وتحددها بأربعة انواع: (١) عدم الاستفادة من وقت العمل واستغلاله بشكل أمثل، (٢) عدم الاستفادة من المؤهلات المتاحة، (٣) العمالة ذات الدخل المنخفض (٤) العمالة ذات الانتاجية المنخفضة.

Unemployed

العاطل:

A person without a job but genuinely desiring work, i.e., actively seeking work.

شخص بدون عمل، ويرغب في الوظيفة ويبحث عنها بشكل فعال.

Unemployment

البطالة:

Amount of unused labor; also, state of being unemployed.

الجزء غير المستخدم من القوى العاملة وكذلك ايضاً العاطلون الذين يبحثون عن عمل.

Seasonal Unemployment

البطالة الموسمية

Unemployment due to seasonal slacking in activity, as in agriculture, where the climate prevents cultivation the year round.

هي البطالة التي تحدث خلال جزء معين من السنة كالبطالة التي تسببها الحالات الجوية في الزراعة.

Self Employed

العامل لحسابه

Working without an employer.

الشخص الذي يعمل لحسابه وبدون رئيس عمل.

Service Sector

قطاع الخدمات

That sector of the economy which includes governmental, community, business, recreational, and personal services.

القطاع الذي يحتوي على الخدمات التي تقدمها المؤسسات الحكومية، الاقتصادية، الاجتماعية، او الخاصة.

Structural Unemployment

البطالة الهيكلية

Unemployment due to changes in methods of work, such as mechanization, replacement of camels and donkeys with motorized trucks, electrification, etc.

البطالة الناتجة عن التغيرات الحاصلة في اسلوب الانتاج، كالتقنية، او ادخال وسائل نقل حديثة بدلاً عن اساليب قديمة.

Surplus Labor

فائض العمل:

Workers for whom there are no jobs.

يشمل العمال الذين لا يجدون اعمال او وظائف.

Traditional Sectors

القطاعات التقليدية

Sectors of economic activity which have not been modernized, such as in developing countries, agriculture, handicraft work, etc. The contrary is the modern sector; generally, manufacture, electricity, transportation, etc.

القطاعات التقليدية هي القطاعات التي تشمل فعاليات اقتصادية لم يتم تحديثها، كاصول الحال في حالات الزراعة والحرف في البلدان النامية وعكسها هي القطاعات الحديثة التي تشمل التحديث كقطاعات الصناعة والكهرباء والمواصلات، الخ.

Manpower Planning Project Training Workshop

Yemen Arab Republic

Volume 2

Manpower Education Model

MRM: Manpower Requirement Model
ESM: Education Simulation Model
MAM: Manpower Allocation Model

Albany, New York
January 1989

IEES

Improving the Efficiency of Educational Systems

The Florida State University
Howard University
Institute for International Research
State University of New York at Albany

United States Agency for International Development
Bureau for Science and Technology
Office of Education
Contract No. DPE-5823-C-00-4013-00

Improving the Efficiency of Educational Systems (IEES) is an initiative funded in 1984 by the Agency for International Development (AID), Bureau for Science and Technology, Office of Education. The principal goals of the IEES Project are to help developing countries improve the performance of their educational systems and strengthen their capabilities for educational planning, management, and research. To achieve these goals, a consortium of U.S. institutions has been formed to work collaboratively with selected host governments and USAID Missions for ten years. The Consortium consists of The Florida State University (prime contractor), Howard University, the Institute for International Research, and the State University of New York at Albany.

There are seven countries working with the IEES initiative to improve educational efficiency: Botswana, Haiti, Indonesia, Liberia, Nepal, Somalia, and Yemen Arab Republic.

Documents published by IEES are produced to promote improved educational practice, planning, and research within these countries. All publications generated by project activities are held in the IEES Educational Efficiency Clearinghouse at The Florida State University. Requests for project documents should be addressed to:

IEES
Educational Efficiency Clearinghouse
Learning Systems Institute
204 Dodd Hall
The Florida State University
Tallahassee, Florida 32306
USA
(904) 644-5442

Agency for International Development
Bureau for Science and Technology
Office of Education
Contract No. DPE-5823-C-00-4013-00
Project No. 936-5823

These materials were prepared for an IEES training workshop for educators from the Yemen Arab Republic (YAR) in January 1989. They consist of three volumes:

Volume 1: DOS/SPSS-PC+/ENABLE/LOTUS 1•2•3
Introduction to Statistics
Volume 2: Manpower Education Model
Volume 3: Manpower Education Model (Exercises, Reference, Summary)

An English/Arabic glossary of Labor Force and Manpower terms is provided in Volume 1.

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Gratitude is expressed to the World Bank, who made their Manpower and Education Model available for training purposes during this workshop.

Volume 2

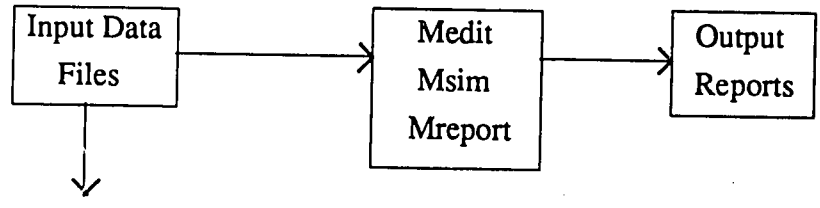
TABLE OF CONTENTS

Manpower Education Model
MEM
Overview

Manpower Education Model
Overview/Notes

A. MRM - Manpower Requirement Model (Demand)
B. ESM- Education Simulation Model (Education and Training System)
C. MAM - Manpower Allocation Model (Supply and Balancing)

Major Components*



1. Input Data Files - for A) MRM = Yarlba.dmr = input data file for demand
B) ESM = Yarlba.des = input data file for projections
C) MAM = Yarlba.dma = input data file for demand and supply

NOTE: MRM and/or ESM can be run separately if required; MAM cannot — it involves the use of all three data files.

2. Medit = to edit, check errors, add, delete, etc. If no errors, go to Msim.
Msim = does the actual calculation; projection for the required number of years, starting from the base year.
Mreport = give the table's name and the year to print the report. It produces a specified table for a specific number of years.

3. Reports = a starting print; have a clear idea of what you want in advance.

* Norton Editor

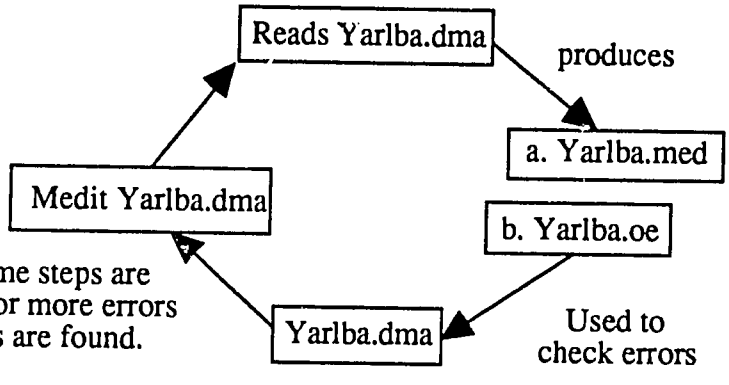
Cycles of MEM Operators

MRM	Files Read	Files Produced
1. Medit	Yarlba.dma	Yarbla.med (binary file)
		Yarlba.oe
2. Msim	Yarlba.med	Yarlba.mer (binary file)
		Yarlba.os
3. Mreport	Yarlba.mer	Yarlba.or

ASCII format and Binary format

All the input data files and all the output files are in an ASCII format, with the exception of the Yarlba.med and Yarlba.mer files, which are in binary format.

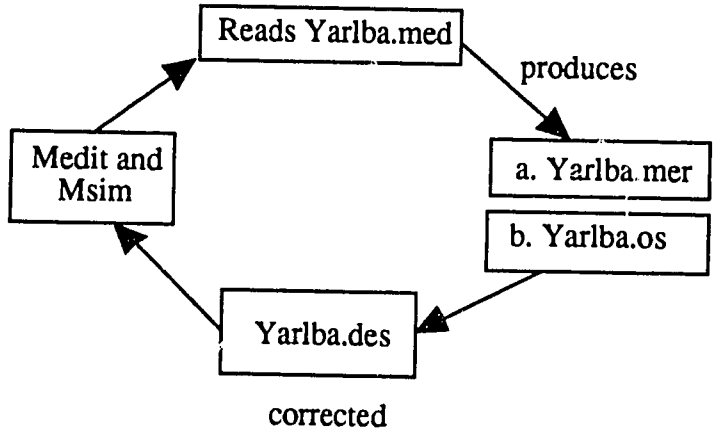
Medit Cycle



Having done the corrections in the original file, the same steps are repeated to check for more errors until no more errors are found.

If there are no errors you can proceed to do the projections (Msim); if there are errors, recall the original data file (Yarlba.dma) to make the necessary corrections.

Msim Cycle



Mreport Cycle

Yarlba.mer ⟶ Yarlba.or

Commands

MRM

- cd\mem
- dir yarlba.des
- to check dat; medit yarlba. _dmr nofile _dmr nofile
  *if there are errors: ne yarlba.or to correct errors: ne yarlba.dmr
- to project (no error): msim yarlba. 1986 6 - yes esm
  *if there are errors, repeat above
- if no error, select a table (ECY) ; mreport yarlba ecy 1986-1991
- to call it up and look at it: ne yarlba.or
- to split the screen: F3, X
- to bring out the original table: ne yarlba.or
- Comparing:

a. To delete a block: 1. move the cursor to the beginning of the block
2. Press **F4**, then **S <>** (<> = return or enter key)
3. Move the cursor to the end of the block
4. Press **F4**, then **S <>**
5. Press **F4**, then **D <>**, then **Y**

b. To print a block: Steps 1 - 4 above,
5. Press **F7**, then **B**, then **Y**

c. To delete a line: Press **ALT+L** (+ = at the same time)

d. To restore the line: Press **Alt+U**

e. To save without exiting: **F3**, then **S**, then **Y** to print

f. To quit: Press **F3**, then **Q**, then **Y**

How to combine files (tables) into one file (exer 123.or)

a. **ne exer123.or**

b. **F3 X**	to split the screen
c. **exer1.or**	to retrieve the file
d. **F4 S**	to define the upper limit of table I
e. **F4 S**	to define the lower limit of table I
f. **F3 X**	to go to upper or lower screen
g. **F3 W**	to copy from lower to upper screen
h. **F3 X**	to go to lower screen
i. **F3 Q Y**	to exit

MRM Tables

- OEPSY
- OSY
- ESP
- PSY
- MRSO
- MROY

ESM

- Yarlba _dma nofile _dmr nofile
- if errors exist: **ne yarlba.oe**
- to correct errors: **ne yarlba.des**
- if no errors: **msim yarlba 1986 6 - yes esm**
- no errors: **mereport yarlba 1986 - 1991 (Section 5)**

ESM Tables

See section five.

- ECY (Enrollment by Course and Year)
- ECLY (Enrollment by Course Level and Year)
- GTCY (Graduates of Terminal Course by Year)

Manpower Requirements Model
MRM
YAR Input Data Set

Introduction

This section contains the input data set for the Manpower Requirements Model, the first sub-model of the Manpower and Education Model. The data in this section are derived from YAR statistics and include estimates and assumptions for training purposes.

-- Manpower Requirements Data

#DESC -- data description
-- - description
-- - text
Manpower Requirements Data for the YAR Test Data set

#TITLE -- report title
-- - title
-- - text

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

#UNITS -- units of output
-- - output
-- - units
YEMENI RIYALS (000s)

#SEC -- economic sectors

-- sector code	sector title
agr	**agriculture and fishing**
m&q	**mining and quarrying**
mfg	**manufacturing**
util	**utilities-electricity and water**
con	**construction**
trh	**trades & hotels**
t&c	**transportation and communication**
b&f	**banking, finance, business services**
ser	**private and public services**

#OCC -- occupation groups

-- occupation code	occupation title
A-1	university science/math based professionals
A-2	university non-science/math based professional
B-1	science/math based technician with post-secondary
B-2	non-science/math based sub-professional with post-secondary
C	skilled and semi-skilled office
D	skilled and semi-skilled manual
E	semi-skilled requiring functional literacy plus OJT
F	unskilled requiring no special education or training

#OUT -- sectoral output

-- year	sector code	output
1986	agr	10608
1986	m&q	506
1986	mfg	4620
1986	util	220
1986	con	1285
1986	trh	4896
1986	t&c	4106
1986	b&f	4166
1986	ser	4746
1987	agr	g3%
1987	m&q	g59.6%
1987	mfg	g9%
1987	util	g15%
1987	con	g5.2%
1987	trh	g5.7%
1987	t&c	g7.2%
1987	b&f	g6.5%
1987	ser	g8.1%

#EMP -- sectoral employment

--	year	sector code	employment
	1986	**agr**	**933500**
	1986	**m&q**	**6400**
	1986	**mfg**	**57800**
	1986	**util**	**51400**
	1986	**con**	**110700**
	1986	**trh**	**125300**
	1986	**t&c**	**45000**
	1986	**b&f**	**20800**
	1986	**ser**	**255300**

#PRD -- labor productivity

--	year	sector code	productivity
	1986	**agr**	**g1.7%**
	1986	**m&q**	**g27.7%**
	1986	**mfg**	**g0.5%**
	1986	**util**	**g10.1%**
	1986	**con**	**g1.4%**
	1986	**trh**	**g1.9%**
	1986	**t&c**	**g2.0%**
	1986	**b&f**	**g1.0%**
	1986	**ser**	**g1.1%**

#EDF -- employment distribution fractions

-- year	sector code	occupation code	fraction of sector employment
1986	agr	A-1	0.07%
1986	agr	A-2	0.04%
1986	agr	B-1	0.39%
1986	agr	B-2	0.04%
1986	agr	C	0.30%
1986	agr	D	0.20%
1986	agr	E	0.40%
1986	agr	F	98.56%
1986	m&q	A-1	1.00%
1986	m&q	A-2	1.00%
1986	m&q	B-1	1.00%
1986	m&q	B-2	0.00%
1986	m&q	C	1.50%
1986	m&q	D	3.00%
1986	m&q	E	5.60%
1986	m&q	F	86.90%
1986	mfg	A-1	0.40%
1986	mfg	A-2	0.50%
1986	mfg	B-1	0.80%
1986	mfg	B-2	0.60%
1986	mfg	C	3.00%
1986	mfg	D	6.00%
1986	mfg	E	12.00%
1986	mfg	F	76.70%
1986	util	A-1	3.00%
1986	util	A-2	1.00%
1986	util	B-1	4.60%
1986	util	B-2	2.00%
1986	util	C	6.00%
1986	util	D	25.00%
1986	util	E	17.00%

1986	util	F	41.40%
1986	con	A-1	0.10%
1986	con	A-2	0.10%
1986	con	B-1	0.10%
1986	con	B-2	0.00%
1986	con	C	0.70%
1986	con	D	2.00%
1986	con	E	28.00%
1986	con	F	69.00%
1986	trh	A-1	0.10%
1986	trh	A-2	0.10%
1986	trh	B-1	0.30%
1986	trh	B-2	2.00%
1986	trh	C	37.00%
1986	trh	D	1.00%
1986	trh	E	21.00%
1986	trh	F	38.50%
1986	t&c	A-1	0.20%
1986	t&c	A-2	0.20%
1986	t&c	B-1	0.50%
1986	t&c	B-2	0.20%
1986	t&c	C	1.80%
1986	t&c	D	4.20%
1986	t&c	E	2.40%
1986	t&c	F	90.70%
1986	b&f	A-1	2.00%
1986	b&f	A-2	4.00%
1986	b&f	B-1	5.00%
1986	b&f	B-2	6.00%
1986	b&f	C	51.00%
1986	b&f	D	0.30%
1986	b&f	E	4.20%
1986	b&f	F	27.50%
1986	ser	A-1	3.70%
1986	ser	A-2	3.70%
1986	ser	B-1	5.20%

1986	ser	B-2	10.00%
1986	ser	C	20.00%
1986	ser	D	9.40%
1986	ser	E	4.00%
1986	ser	F	44.00%

-- end of data --

Education Simulation Model
ESM
YAR Input Data Set

Introduction

This section contains the input data set for the Education Simulation Model, the second sub-model of the Manpower and Education Model. The data in this section are derived from YAR statistics and include estimates and assumptions for training purposes.

-- Education Simulation Test Data

#DESC -- data description
-- description
-- text

Education Projection is based on YAR3 with updating and changes. Changes included enrollment in the University faculties by year. It also includes fine tuning of the flow of students into the university faculties taking into consideration each faculty present capacity.

Sources:
Educational Statistical Yearbook, MOE, 1987
Education in 25 years of the revolution, MOE, 1988
Statistical Year Book 1986, CPO
Assumptions:
constant efficiency rates
constant disposition rates

#TITLE -- report title
-- title
-- text

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

#AGE -- age range
-- minimum maximum
-- age age
5 24

#TG -- teacher groups

-- teacher group code	teacher group title
elem	**elementary**
inter	**intermediate**
voc	**vocational**
sec	**secondary**
isla	**islamic**
agri	**agriculture**
comm	**commercial**
indus	**industrial**
psecsci	**post secondary science**
psecart	**post secondary non-science**
univart	**university art**
univsci	**university science**

#CL -- course levels

-- course level code	course level title
elem	**elementary**
inter	**intermediate**
sec	**secondary**
psec	**post secondary**
univart	**university art**
univsci	**university science**

#COR -- courses

-- course code	ideal age	number of ages	males, females, or both	terminal course?	teacher group code	course level code	course title
grd1	6	1	mf	n	elem	elem	grade 1
grd2	7	1	mf	n	elem	elem	grade 2
grd3	8	1	mf	n	elem	elem	grade 3
grd4	9	1	mf	n	elem	elem	grade 4
grd5	10	1	mf	n	elem	elem	grade 5
grd6	11	1	mf	y	elem	elem	grade 6
gen7	12	1	mf	n	inter	inter	general 7
gen8	13	1	mf	n	inter	inter	general 8
gen9	14	1	mf	y	inter	inter	general 9
ptti7	12	1	mf	n	inter	inter	primary teacher train7
ptti8	13	1	mf	n	inter	inter	primary teacher train8
ptti9	14	1	mf	n	inter	inter	primary teacher train9
ptti10	15	1	mf	n	inter	inter	primary teacher train10
ptti11	16	1	mf	y	inter	inter	primary teacher train11
vtc7	12	1	m	n	voc	inter	vocational tech7
vtc8	13	1	m	y	voc	inter	vocational tech8
gen10	15	1	mf	n	sec	sec	general10
art11	16	1	mf	n	sec	sec	art12
sci11	16	1	mf	n	sec	sec	science11
sci12	17	1	mf	y	sec	sec	science12
uptt10	15	1	mf	n	sec	sec	gen prim teacher train10
uptt11	16	1	mf	n	sec	sec	gen prim teacher train11
uptt12	17	1	mf	y	sec	sec	gen prim teacher train12
isla10	15	1	m	n	isla	sec	islamic 10
isla11	16	1	m	n	isla	sec	islamic art11
isla12	17	1	m	y	isla	sec	islamic art12
issci11	16	1	m	n	isla	sec	islamic science11
issci12	17	1	m	y	isla	sec	islamic science12
agri10	15	1	m	n	agri	sec	agriculture10
agri11	16	1	m	n	agri	sec	agriculture11
agri12	17	1	m	y	agri	sec	agriculture12
comm10	15	1	mf	n	comm	sec	commercial10

comm11	16	1	mf	n	comm	sec	commercial11
comm12	17	1	mf	y	comm	sec	commercial12
intec10	15	1	m	n	indus	sec	industrial/technical 10
intec11	16	1	m	n	indus	sec	industrial/technical 11
intec12	17	1	m	y	indus	sec	industrial/technical 12
sptt13	18	1	mf	n	psecart	psec	senior prim teaching yr1
sptt14	19	1	mf	y	psecart	psec	senior prim teaching yr 2
ptech13	18	1	m	n	psecsci	psec	polytech yr 1
ptech14	19	1	m	y	psecsci	psec	polytech yr 2
med13	18	1	mf	n	univsci	univsci	medicine yr1
med14	19	1	mf	n	univsci	univsci	medicine yr2
med15	20	1	mf	n	univsci	univsci	medicine yr3
med16	21	1	mf	n	univsci	univsci	medicine yr4
med17	22	1	mf	n	univsci	univsci	medicine yr5
med18	23	1	mf	y	univsci	univsci	medicine yr6
eng13	18	1	mf	n	univsci	univsci	engineeringyr 1
eng14	19	1	mf	n	univsci	univsci	engineeringyr 2
eng15	20	1	mf	n	univsci	univsci	engineeringyr 3
eng16	21	1	mf	y	univsci	univsci	engineeringyr 4
sci13	18	1	mf	n	univsci	univsci	science yr 1
sci14	19	1	mf	n	univsci	univsci	science yr 2
sci15	20	1	mf	n	univsci	univsci	science yr 3
sci16	21	1	mf	y	univsci	univsci	science yr 4
agri13	18	1	mf	n	univsci	univsci	agricultureyr 1
agri14	19	1	mf	n	univsci	univsci	agricultureyr 2
agri15	20	1	mf	n	univsci	univsci	agricultureyr 3
agri16	21	1	mf	y	univsci	univsci	agricultureyr 4
lib13	18	1	mf	n	univart	univart	liberal artsyr 1
lib14	19	1	mf	n	univart	univart	liberal artsyr 2
lib15	20	1	mf	n	univart	univart	liberal artsyr 3
lib16	21	1	mf	y	univart	univart	liberal artsyr 4
busec13	18	1	mf	n	univart	univart	business/econ yr 1
busec14	19	1	mf	n	univart	univart	business/econ yr 2
busec15	20	1	mf	n	univart	univart	business/econ yr 3
busec16	21	1	mf	y	univart	univart	business/econ yr 4
lawsh13	18	1	mf	n	univart	univart	law and sharie yr 1

```
lawsh14  19  1    mf    n    univart univart law and sharie yr 2
lawsh15  20  1    mf    n    univart univart law and sharie yr 3
lawsh16  21  1    mf    y    univart univart law and sharie yr 4
edu13    18  1    mf    n    univart univart education yr1
edu14    19  1    mf    n    univart univart education yr2
edu15    20  1    mf    n    univart univart education yr3
edu16    21  1    mf    y    univart univart education yr4

#EC -- enrollment capacities
--                        male,
--              course    female,   enrollment
--      year    code      or each   capacity

#CPS -- cost per student
--                        cost
--              course    per
--      year    code      student


#STR -- student teacher ratios
--                        students
--              course    per
--      year    code      teacher
```

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	71%	18%	11%	0%	0%
1986	grd2	m	80%	10%	10%	0%	0%
1986	grd3	m	72%	17%	11%	0%	0%
1986	grd4	m	77%	13%	10%	0%	0%
1986	grd5	m	81%	9%	10%	0%	0%
1986	grd6	m	70%	5%	6%	19%	0%
1986	gen7	m	80%	10%	10%	0%	0%
1986	gen8	m	90%	5%	5%	0%	0%
1986	gen9	m	82%	8%	5%	5%	0%
1986	ptti7	m	80%	10%	10%	0%	0%
1986	ptti8	m	90%	5%	5%	0%	0%
1986	ptti9	m	85%	8%	7%	0%	0%
1986	ptti10	m	85%	8%	7%	0%	0%
1986	ptti11	m	0%	8%	7%	85%	0%
1986	vtc7	m	82%	8%	10%	0%	0%
1986	vtc8	m	0%	1%	6%	93%	0%
1986	gen10	m	65%	8%	27%	0%	0%
1986	art11	m	82%	6%	12%	0%	0%
1986	art12	m	45%	5%	1%	49%	0%
1991	art12	m	10%	5%	1%	84%	0%
1996	art12	m	8%	5%	1%	86%	0%
1986	sci11	m	82%	10%	8%	0%	0%
1986	sci12	m	70%	8%	2%	20%	0%
1991	sci12	m	20%	8%	2%	70%	0%
1996	sci12	m	18%	8%	2%	72%	0%
1986	uptt10	m	85%	10%	5%	0%	0%
1986	uptt11	m	85%	10%	5%	0%	0%
1986	uptt12	m	0%	10%	5%	85%	0%
1986	isla10	m	91%	4%	5%	0%	0%
1986	isla11	m	87%	2%	11%	0%	0%
1986	isla12	m	74%	1%	5%	20%	0%

1986	issci11	m	86%	3%	11%	0%	0%
1986	issci12	m	50%	8%	8%	34%	0%
1986	agri10	m	83%	15%	2%	0%	0%
1986	agri11	m	77%	14%	9%	0%	0%
1986	agri12	m	0%	5%	5%	90%	0%
1986	comm10	m	95%	3%	2%	0%	0%
1986	comm11	m	95%	3%	2%	0%	0%
1986	comm12	m	0%	5%	5%	90%	0%
1986	intec10	m	82%	13%	5%	0%	0%
1986	intec11	m	95%	3%	2%	0%	0%
1986	intec12	m	0%	3%	2%	95%	0%
1986	sptt13	m	85%	10%	5%	0%	0%
1986	sptt14	m	0%	10%	5%	85%	0%
1986	ptech13	m	80%	10%	10%	0%	0%
1986	ptech14	m	0%	5%	5%	90%	0%
1986	med13	m	80%	10%	10%	0%	0%
1986	med14	m	95%	2%	3%	0%	0%
1986	med15	m	95%	2%	3%	0%	0%
1986	med16	m	95%	2%	3%	0%	0%
1986	med17	m	95%	2%	3%	0%	0%
1986	med18	m	0%	2%	3%	95%	0%
1986	eng13	m	70%	10%	20%	0%	0%
1986	eng14	m	96%	0%	4%	0%	0%
1986	eng15	m	96%	0%	4%	0%	0%
1986	eng16	m	0%	0%	4%	96%	0%
1986	sci13	m	65%	10%	25%	0%	0%
1986	sci14	m	92%	4%	4%	0%	0%
1986	sci15	m	92%	4%	4%	0%	0%
1986	sci16	m	0%	4%	4%	92%	0%
1986	agri13	m	70%	10%	20%	0%	0%
1986	agri14	m	95%	0%	5%	0%	0%
1986	agri15	m	95%	0%	5%	0%	0%
1986	agri16	m	0%	0%	5%	95%	0%
1986	lib13	m	80%	10%	10%	0%	0%
1986	lib14	m	90%	5%	5%	0%	0%
1986	lib15	m	90%	5%	5%	0%	0%

1986	lib16	m	0%	5%	5%	90%	0%
1986	busec13	m	90%	5%	5%	0%	0%
1986	busec14	m	90%	5%	5%	0%	0%
1986	busec15	m	90%	5%	5%	0%	0%
1986	busec16	m	0%	5%	5%	90%	0%
1986	lawsh13	m	65%	10%	25%	0%	0%
1986	lawsh14	m	90%	5%	5%	0%	0%
1986	lawsh15	m	90%	5%	5%	0%	0%
1986	lawsh16	m	0%	5%	5%	90%	0%
1986	edu13	m	75%	10%	15%	0%	0%
1986	edu14	m	90%	5%	5%	0%	0%
1986	edu15	m	90%	5%	5%	0%	0%
1986	edu16	m	0%	5%	5%	90%	0%
1986	grd1	f	85%	8%	7%	0%	0%
1986	grd2	f	71%	6%	23%	0%	0%
1986	grd3	f	80%	12%	8%	0%	0%
1986	grd4	f	72%	7%	21%	0%	0%
1986	grd5	f	77%	4%	19%	0%	0%
1986	grd6	f	60%	5%	14%	21%	0%
1986	gen7	f	78%	12%	10%	0%	0%
1986	gen8	f	89%	5%	6%	0%	0%
1986	gen9	f	70%	15%	10%	5%	0%
1986	ptti7	f	80%	10%	10%	0%	0%
1986	ptti8	f	90%	5%	5%	0%	0%
1986	ptti9	f	85%	8%	7%	0%	0%
1986	ptti10	f	85%	8%	7%	0%	0%
1986	ptti11	f	0%	8%	7%	85%	0%
1986	gen10	f	90%	5%	5%	0%	0%
1986	art11	f	85%	2%	13%	0%	0%
1986	art12	f	45%	2%	1%	52%	0%
1991	art12	f	20%	5%	1%	74%	0%
1996	art12	f	14%	5%	1%	80%	0%
1986	sci11	f	93%	4%	3%	0%	0%
1986	sci12	f	66%	6%	6%	22%	0%
1991	sci12	f	27%	8%	2%	63%	0%
1996	sci12	f	24%	8%	2%	66%	0%

1986	uptt10	f	85%	10%	5%	0%	0%
1986	uptt11	f	85%	10%	5%	0%	0%
1986	uptt12	f	0%	10%	5%	85%	0%
1986	comm10	f	95%	3%	2%	0%	0%
1986	comm11	f	95%	3%	2%	0%	0%
1986	comm12	f	0%	3%	2%	95%	0%
1986	sptt13	f	85%	10%	5%	0%	0%
1986	sptt14	f	0%	10%	5%	85%	0%
1986	med13	f	95%	0%	5%	0%	0%
1986	med14	f	95%	0%	5%	0%	0%
1986	med15	f	95%	0%	5%	0%	0%
1986	med16	f	95%	0%	5%	0%	0%
1986	med17	f	95%	0%	5%	0%	0%
1986	med18	f	0%	0%	5%	95%	0%
1986	eng13	f	70%	10%	20%	0%	0%
1986	eng14	f	96%	0%	4%	0%	0%
1986	eng15	f	96%	0%	4%	0%	0%
1986	eng16	f	0%	0%	4%	96%	0%
1986	sci13	f	43%	0%	57%	0%	0%
1986	sci14	f	92%	0%	8%	0%	0%
1986	sci15	f	92%	0%	8%	0%	0%
1986	sci16	f	0%	0%	8%	92%	0%
1986	agri13	f	70%	10%	20%	0%	0%
1986	agri14	f	95%	0%	5%	0%	0%
1986	agri15	f	95%	0%	5%	0%	0%
1986	agri16	f	0%	0%	5%	95%	0%
1986	lib13	f	80%	10%	10%	0%	0%
1986	lib14	f	90%	5%	5%	0%	0%
1986	lib15	f	90%	5%	5%	0%	0%
1986	lib16	f	0%	5%	5%	90%	0%
1986	busec13	f	90%	5%	5%	0%	0%
1986	busec14	f	90%	5%	5%	0%	0%
1986	busec15	f	90%	5%	5%	0%	0%
1986	busec16	f	0%	5%	5%	90%	0%
1986	lawsh13	f	65%	10%	25%	0%	0%
1986	lawsh14	f	90%	5%	5%	0%	0%

```
1986  lawsh15   f   90%  5%  5%  0%  0%
1986  lawsh16   f   0%   5%  5%  90% 0%
1986  edu13     f   75%  10% 15% 0%  0%
1986  edu14     f   90%  5%  5%  0%  0%
1986  edu15     f   90%  5%  5%  0%  0%
1986  edu16     f   0%   5%  5%  90% 0%

#PC -- promotion courses
--    source  promotion
--    course  course
--      code  codes
      grd1  grd2
      grd2  grd3
      grd3  grd4
      grd4  grd5
      grd5  grd6
      grd6  gen7  ptti7  vtc7
      gen7  gen8
      gen8  gen9
      ptti7  ptti8
      ptti8  ptti9
      ptti9  ptti10
      ptti10 ptti11
      vtc7  vtc8
      gen9  gen10 uptt10 isla10 agri10 comm10 intec10
      gen10 art11 sci11
      art11 art12
      art12 sptt13 lib13 busec13 lawsh13 edu13
      sci11 sci12
      sci12 ptech13 med13 eng13 sci13 agri13 sptt13 lib13 busec13 lawsh13 edu13
      uptt10 uptt11
      uptt11 uptt12
      isla10 isla11 issci11
      isla11 isla12
      isla12 lib13 busec13 lawsh13 edu13
      issci11 issci12
```

issci12 med13 engl3 sci13 agri13 lib13 busec13 lawsh13 edu13

agri10	agri11
agri11	agri12
comm10	comm11
comm11	comm12
intec10	intec11
intec11	intec12
sptt13	sptt14
ptech13	ptech14
med13	med14
med14	med15
med15	med16
med16	med17
med17	med18
eng13	eng14
eng14	eng15
eng15	eng16
sci13	sci14
sci14	sci15
sci15	sci16
agri13	agri14
agri14	agri15
agri15	agri16
lib13	lib14
lib14	lib15
lib15	lib16
busec13	busec14
busec14	busec15
busec15	busec16
lawsh13	lawsh14
lawsh14	lawsh15
lawsh15	lawsh16
edu13	edu14
edu14	edu15
edu15	edu16

```
#PSR -- promotion splitting rates
--              source  male,  promotion
--              course  female, splitting
--      year    code    or each  rates
        1986    grd1      m      100%
        1986    grd2      m      100%
        1986    grd3      m      100%
        1986    grd4      m      100%
        1986    grd5      m      100%

--              grd6              gen7   ptti7  vtc7
        1986    grd6      m       95%    4%     1%
        1986    gen7      m      100%
        1986    gen8      m      100%

--              gen9              gen10  uptt10 isla10 agri10 comm10 intec10
        1986    gen9      m       92%     3%     1%     1%      1%     2%
        1986    ptti7     m      100%
        1986    ptti8     m      100%
        1986    ptti9     m      100%
        1986    ptti10    m      100%
        1986    vtc7      m      100%

--              gen10             art11  sci11
        1986    gen10     m       45%    55%
        1986    art11     m      100%

--*     art12-->                  sptt13 lib13  busec13 lawsh13 edu13
        1986    art12     m        0%    15%     20%     45%     20%
        1990    art12     m        5%    10%     20%     45%     20%
        1986    sci11     m      100%
```

--* sci12 --->		ptech13	med13	eng13	sci13	agri13	sptt13	lib13	busec13	lawsh13	edu13
1986 sci12	m	0%	10%	7%	6%	7%	0%	4%	40%	14%	12%
1990 sci12	m	5%	10%	7%	6%	7%	5%	4%	30%	14%	12%
1986 uptt10	m	100%									
1986 uptt11	m	100%									

-- isla10			isla11	issci11
1986	isla10	m	40%	60%
1986	isla11	m	100%	

-- isla12			lib13	busec13	lawsh13	edu13
1986	isla12	m	30%	10%	50%	10%
1986	issci11	m	100%			

— issci12			med13	eng13	sci13	agri13	lib13	busec13	lawsh13	edu13
1986	issci12	m	5%	5%	2%	2%	20%	40%	14%	12%
1986	agri10	m	100%							
1986	agri11	m	100%							
1986	comm10	m	100%							
1986	comm11	m	100%							
1986	intec10	m	100%							
1986	intec11	m	100%							
1986	med13	m	100%							
1986	med14	m	100%							
1986	med15	m	100%							
1986	med16	m	100%							
1986	med17	m	100%							
1986	eng13	m	100%							
1986	eng14	m	100%							
1986	eng15	m	100%							
1986	sci13	m	100%							
1986	sci14	m	100%							
1986	sci15	m	100%							
1986	agri13	m	100%							
1986	agri14	m	100%							

1986	agri15	m	100%
1986	lib13	m	100%
1986	lib14	m	100%
1986	lib15	m	100%
1986	busec13	m	100%
1986	busec14	m	100%
1986	busec15	m	100%
1986	lawsh13	m	100%
1986	lawsh14	m	100%
1986	lawsh15	m	100%
1986	edu13	m	100%
1986	edu14	m	100%
1986	edu15	m	100%
1986	grd1	f	100%
1986	grd2	f	100%
1986	grd3	f	100%
1986	grd4	f	100%
1986	grd5	f	100%

grd6			gen7	ptti7	vtc7
1986	grd6	f	90%	10%	0%
1986	gen7	f	100%		
1986	gen8	f	100%		

	gen9		gen10	uptt10	isla10	agri10	comm10	intec10
1986	gen9	f	92%	8%	0%	0%	0%	0%
1986	ptti7	f	100%					
1986	ptti8	f	100%					
1986	ptti9	f	100%					
1986	ptti10	f	100%					

--	gen10		art11	sci11
1986	gen10	f	50%	50%
1986	art11	f	100%	

--*	art12-->			sptt13	lib13	busec13	lawsh13	edu13
	1986	art12	f	0%	30%	15%	5%	50%
	1990	art12	f	5%	25%	15%	5%	50%
	1986	sci11	f	100%				

--*	sci12 --->		ptech13	med13	eng13	sci13	agri13	sptt13	lib13	busec13	lawsh13	edu13
1986	sci12	f	0%	15%	4%	10%	1%	0%	20%	27%	8%	15%
1990	sci12	f	0%	15%	4%	10%	1%	5%	15%	27%	8%	15%
	1986	uptt10	f	100%								
	1986	uptt11	f	100%								
	1986	med13	f	100%								
	1986	med14	f	100%								
	1986	med15	f	100%								
	1986	med16	f	100%								
	1986	med17	f	100%								
	1986	eng13	f	100%								
	1986	eng14	f	100%								
	1986	eng15	f	100%								
	1986	sci13	f	100%								
	1986	sci14	f	100%								
	1986	sci15	f	100%								
	1986	agri13	f	100%								
	1986	agri14	f	100%								
	1986	agri15	f	100%								
	1986	lib13	f	100%								
	1986	lib14	f	100%								
	1986	lib15	f	100%								
	1986	busec13	f	100%								
	1986	busec14	f	100%								
	1986	busec15	f	100%								
	1986	lawsh13	f	100%								
	1986	lawsh14	f	100%								
	1986	lawsh15	f	100%								
	1986	edu13	f	100%								
	1986	edu14	f	100%								
	1986	edu15	f	100%								

#TC -- transfer courses

--	source course code	transfer course codes

#TSR -- transfer splitting rates

--	year	source course code	male, female, or each	transfer splitting rates

#ENT -- entrants

--	year	course code	entrant age	male, female, or each	number of entrants
	1987	**grd1**	**6**	**m**	**185585**
	1996	**grd1**	**6**	**m**	**267000**
	1987	**grd1**	**6**	**f**	**75000**
	1996	**grd1**	**6**	**f**	**134000**

#NES -- persons not entering school

--	year	age	male, female, or each	number not entering
	1986	**6**	**m**	**20000**
	1996	**6**	**m**	**0**
	1986	**6**	**f**	**90000**
	1996	**6**	**f**	**0**

#ENR -- enrollments

--	year	course code	student age	male, female, or each	number enrolled
	1986	**grd1**	**6**	**m**	**180180**
	1986	**grd2**	**7**	**m**	**155447**
	1986	**grd3**	**8**	**m**	**140983**
	1986	**grd4**	**9**	**m**	**113743**

1986	grd5	10	m	91195
1986	grd6	11	m	93307
1986	gen7	12	m	59623
1986	gen8	13	m	35977
1986	gen9	14	m	26408
1986	ptti7	12	m	1700
1986	ptti8	13	m	1600
1986	ptti9	14	m	1500
1986	ptti10	15	m	1400
1986	ptti11	16	m	1300
1986	vtc7	12	m	500
1986	vtc8	13	m	476
1986	gen10	15	m	15960
1986	art11	16	m	6000
1986	art12	17	m	5000
1986	sci11	16	m	4000
1986	sci12	17	m	3000
1986	uptt10	15	m	400
1986	uptt11	16	m	350
1986	uptt12	17	m	250
1986	isla10	15	m	120
1986	isla11	16	m	61
1986	isla12	17	m	87
1986	issci11	16	m	59
1986	issci12	17	m	48
1986	agri10	15	m	130
1986	agri11	16	m	100
1986	agri12	17	m	72
1986	comm10	15	m	250
1986	comm11	16	m	225
1986	comm12	17	m	143
1986	intec10	15	m	371
1986	intec11	16	m	250
1986	intec12	17	m	150
1986	sptt13	18	m	0
1986	sptt14	19	m	0

1986	ptech13	18	m	0
1986	ptech14	19	m	0
1986	med13	18	m	250
1986	med14	19	m	150
1986	med15	20	m	14
1986	med16	21	m	14
1986	med17	22	m	0
1986	med18	23	m	0
1986	eng13	18	m	129
1986	eng14	19	m	102
1986	eng15	20	m	102
1986	eng16	21	m	102
1986	sci13	18	m	161
1986	sci14	19	m	39
1986	sci15	20	m	36
1986	sci16	21	m	35
1986	agri13	18	m	136
1986	agri14	19	m	25
1986	agri15	20	m	25
1986	agri16	21	m	21
1986	lib13	18	m	589
1986	lib14	19	m	267
1986	lib15	20	m	211
1986	lib16	21	m	95
1986	busec13	18	m	1662
1986	busec14	19	m	635
1986	busec15	20	m	494
1986	busec16	21	m	309
1986	lawsh13	18	m	1656
1986	lawsh14	19	m	1209
1986	lawsh15	20	m	1008
1986	lawsh16	21	m	632
1986	edu13	18	m	904
1986	edu14	19	m	266
1986	edu15	20	m	225
1986	edu16	21	m	109

1986	grd1	6	f	64597
1986	grd2	7	f	49236
1986	grd3	8	f	39629
1986	grd4	9	f	25647
1986	grd5	10	f	18036
1986	grd6	11	f	13723
1986	gen7	12	f	7479
1986	gen8	13	f	3985
1986	gen9	14	f	3215
1986	ptti7	12	f	720
1986	ptti8	13	f	700
1986	ptti9	14	f	680
1986	ptti10	15	f	650
1986	ptti11	16	f	717
1986	gen10	15	f	1923
1986	art11	16	f	427
1986	art12	17	f	338
1986	sci11	16	f	821
1986	sci12	17	f	719
1986	uptt10	15	f	300
1986	uptt11	16	f	200
1986	uptt12	17	f	239
1986	comm10	15	f	71
1986	comm11	16	f	46
1986	comm12	17	f	46
1986	sptt13	18	f	0
1986	sptt14	19	f	0
1986	med13	18	f	70
1986	med14	19	f	21
1986	med15	20	f	17
1986	med16	21	f	5
1986	med17	22	f	0
1986	med18	23	f	0
1986	eng13	18	f	19
1986	eng14	19	f	5
1986	eng15	20	f	0

1986	eng16	21	f	0
1986	sci13	18	f	42
1986	sci14	19	f	15
1986	sci15	20	f	16
1986	sci16	21	f	13
1986	agri13	18	f	4
1986	agri14	19	f	1
1986	agri15	20	f	0
1986	agri16	21	f	0
1986	lib13	18	f	205
1986	lib14	19	f	102
1986	lib15	20	f	57
1986	lib16	21	f	32
1986	busec13	18	f	194
1986	busec14	19	f	73
1986	busec15	20	f	59
1986	busec16	21	f	44
1986	lawsh13	18	f	44
1986	lawsh14	19	f	29
1986	lawsh15	20	f	17
1986	lawsh16	21	f	17
1986	edu13	18	f	295
1986	edu14	19	f	96
1986	edu15	20	f	48
1986	edu16	21	f	23

-- end of data --

Manpower Allocation Model
M A M
YAR Input Data Set

Introduction

This section contains the input data set for the Manpower Allocation Model, the third sub-model of the Manpower and Education Model. The data in this section are derived from YAR statistics and include estimates and assumptions for training purposes.

-- Manpower Allocation Data

#DESC -- data description
-- description
-- text
Manpower Allocation Data for YAR Test Dataset

#TITLE -- report title
-- title
-- text

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

#UNITS units of output (optional if included in Manpower Requirements data)
-- output
- units

#AGE -- age range (optional if included in Education Simulation data)
-- minimum maximum
-- age age

#MWA -- minimum working age
-- minimum
-- age
- to work
15

```
#WP -- waiting periods in time filters
-- maximum maximum    maximum
-- leaver  leaker outmigration
--  wait    wait       time
     0       0          7

#COR --  courses (optional if included in Education Simulation data)
--                  number   males,
--  course ideal    of       females, course
--   code   age    ages     or both    title

#NAT -- nationalities
--       nationality     nationality
--         code            title
           exp          non Yemenis

#SEC -- economic sectors (optional if included in Manpower Requirements data)
-- sector          sector
-- code            title

#OCC -- occupation groups (optional if included in Manpower Requirements data)
-- occupation      occupation
--   code              title
```

#POOL -- labor pools

-- labor pool code	labor pool title
one	**professional and technical occupations (A-1)**
two	**other professional occupation (A-2)**
three	**science technician (B-1)**
four	**non-science sub-professional (B-2)**
five	**skilled/intermediate-skilled office occupation (C)**
six	**skilled/intermediate-skilled manual occupation (D)**
seven	**semi-skilled:primary/literacy plus job training (E)**
eight	**unskilled occupation (F)**

#TO -- target sectoral output

-- year	sector code	target output

#TMR -- target manpower requirements

-- year	sector code	occupation code	manpower requirement

#IUSL -- initial underage school leavers

-- year	course code	graduate or dropout	male, female, age	number of or each	leavers
1986	**grd1**	**d**	**6**	**m**	**18000**
1986	**grd2**	**d**	**7**	**m**	**9000**
1986	**grd1**	**d**	**7**	**m**	**9000**
1986	**grd3**	**d**	**8**	**m**	**6000**
1986	**grd2**	**d**	**8**	**m**	**6000**
1986	**grd1**	**d**	**8**	**m**	**6000**

1986	grd4	d	9	m	4000
1986	grd3	d	9	m	4000
1986	grd2	d	9	m	5000
1986	grd1	d	9	m	5000
1986	grd5	d	10	m	2000
1986	grd4	d	10	m	2000
1986	grd3	d	10	m	3000
1986	grd2	d	10	m	5000
1986	grd1	d	10	m	6000
1986	grd6	d	11	m	1000
1986	grd5	d	11	m	1000
1986	grd4	d	11	m	2000
1986	grd3	d	11	m	3000
1986	grd2	d	11	m	5000
1986	grd1	d	11	m	6000
1986	gen7	d	12	m	1000
1986	grd6	d	12	m	1000
1986	grd5	d	12	m	1000
1986	grd4	d	12	m	1000
1986	grd3	d	12	m	3000
1986	grd2	d	12	m	5000
1986	grd1	d	12	m	6000
1986	gen8	d	13	m	1000
1986	gen7	d	13	m	1000
1986	grd6	d	13	m	1000
1986	grd5	d	13	m	1000
1986	grd4	d	13	m	2000
1986	grd3	d	13	m	3000
1986	grd2	d	13	m	4000
1986	grd1	d	13	m	5000

1986	gen9	d	14	m	1000
1986	gen8	d	14	m	1000
1986	gen7	d	14	m	1000
1986	grd6	d	14	m	1000
1986	grd5	d	14	m	1000
1986	grd4	d	14	m	1000
1986	grd3	d	14	m	3000
1986	grd2	d	14	m	4000
1986	grd1	d	14	m	5000
1986	grd1	d	6	f	18000
1986	grd2	d	7	f	9000
1986	grd1	d	7	f	9000
1986	grd3	d	8	f	6000
1986	grd2	d	8	f	6000
1986	grd1	d	8	f	6000
1986	grd4	d	9	f	4000
1986	grd3	d	9	f	4000
1986	grd2	d	9	f	5000
1986	grd1	d	9	f	5000
1986	grd5	d	10	f	2000
1986	grd4	d	10	f	2000
1986	grd3	d	10	f	3000
1986	grd2	d	10	f	5000
1986	grd1	d	10	f	6000

1986	grd6	d	11	f	1000
1986	grd5	d	11	f	1000
1986	grd4	d	11	f	2000
1986	grd3	d	11	f	3000
1986	grd2	d	11	f	5000
1986	grd1	d	11	f	6000
1986	gen7	d	12	f	1000
1986	grd6	d	12	f	1000
1986	grd5	d	12	f	1000
1986	grd4	d	12	f	1000
1986	grd3	d	12	f	3000
1986	grd2	d	12	f	5000
1986	grd1	d	12	f	6000
1986	gen8	d	13	f	1000
1986	gen7	d	13	f	1000
1986	grd6	d	13	f	1000
1986	grd5	d	13	f	1000
1986	grd4	d	13	f	2000
1986	grd3	d	13	f	3000
1986	grd2	d	13	f	4000
1986	grd1	d	13	f	5000
1986	gen9	d	14	f	1000
1986	gen8	d	14	f	1000
1986	gen7	d	14	f	1000
1986	grd6	d	14	f	1000
1986	grd5	d	14	f	1000
1986	grd4	d	14	f	1000
1986	grd3	d	14	f	3000
1986	grd2	d	14	f	4000
1986	grd1	d	14	f	5000

```
#IWSL -- initial working-age school leavers
--                          graduate  male,   number
--                course      or      female,  of
--      year      code     dropout    or each  leavers
        1986      grd1        d          m        0

#NSL -- new school leavers
--                          graduate          male,   number
--                course      or              female,  of
--      year      code     dropout    age     or each  leavers

#AWSL -- additional working-age school leavers
--                          graduate  male,   number
--                course      or      female,  of
--      year      code     dropout    or each  leavers
```

#IUP -- initial unschooled persons

-- year	age	male, female, or each	number of persons
1986	**7**	**m**	**18000**
1986	**8**	**m**	**18000**
1986	**9**	**m**	**18000**
1986	**10**	**m**	**10000**
1986	**11**	**m**	**15000**
1986	**12**	**m**	**17000**
1986	**13**	**m**	**20000**
1986	**14**	**m**	**30000**
1986	**6**	**f**	**6900**
1986	**7**	**f**	**7400**
1986	**8**	**f**	**7500**
1986	**9**	**f**	**7900**
1986	**10**	**f**	**8200**
1986	**11**	**f**	**8600**
1986	**12**	**f**	**9000**
1986	**13**	**f**	**9900**
1986	**14**	**f**	**10100**

#NES -- persons not entering school

-- year	age	male, female, or each	number not entering

#UPR -- underage labor force participation rate

-- year	course code	graduate or dropout	age	male, female, or each	participation rate
1986	**grd1**	**d**	**14**	**m**	**40%**
1986	**grd2**	**d**	**14**	**m**	**40%**
1986	**grd3**	**d**	**14**	**m**	**40%**

1986	grd4	d	14	m	40%
1986	grd5	d	14	m	40%
1986	grd6	b	14	m	40%
1986	gen7	d	14	m	40%
1986	gen8	d	14	m	40%
1986	gen9	b	14	m	40%
1986	grd1	d	13	m	30%
1986	grd2	d	13	m	30%
1986	grd3	d	13	m	30%
1986	grd4	d	13	m	30%
1986	grd5	d	13	m	30%
1986	grd6	b	13	m	30%
1986	gen7	d	13	m	30%
1986	gen8	d	13	m	30%
1986	grd1	d	12	m	20%
1986	grd2	d	12	m	20%
1986	grd3	d	12	m	20%
1986	grd4	d	12	m	20%
1986	grd5	d	12	m	20%
1986	grd6	b	12	m	20%
1986	gen7	d	12	m	20%
1986	grd1	d	11	m	20%
1986	grd2	d	11	m	20%
1986	grd3	d	11	m	20%
1986	grd4	d	11	m	20%
1986	grd5	d	11	m	20%
1986	grd6	b	11	m	20%
1986	vtc7	d	12	m	50%
1986	vtc7	d	13	m	60%
1986	vtc7	d	14	m	70%
1986	vtc8	b	13	m	70%
1986	vtc8	b	14	m	80%
1986	ptti7	d	12	m	50%
1986	ptti7	d	13	m	50%
1986	ptti7	d	14	m	60%
1986	ptti8	d	13	m	70%

1986	ptti8	d	14	m	70%
1986	ptti9	d	14	m	70%
1986	grd1	d	14	f	10%
1986	grd2	d	14	f	10%
1986	grd3	d	14	f	10%
1986	grd4	d	14	f	10%
1986	grd5	d	14	f	10%
1986	grd6	b	14	f	10%
1986	gen7	d	14	f	10%
1986	gen8	d	14	f	10%
1986	gen9	b	14	f	10%
1986	grd1	d	13	f	9%
1986	grd2	d	13	f	9%
1986	grd3	d	13	f	9%
1986	grd4	d	13	f	9%
1986	grd5	d	13	f	9%
1986	grd6	b	13	f	9%
1986	gen7	d	13	f	9%
1986	gen8	d	13	f	9%
1986	grd1	d	12	f	6%
1986	grd2	d	12	f	6%
1986	grd3	d	12	f	6%
1986	grd4	d	12	f	6%
1986	grd5	d	12	f	6%
1986	grd6	b	12	f	6%
1986	gen7	d	12	f	6%
1986	grd1	d	11	f	3%
1986	grd2	d	11	f	3%
1986	grd3	d	11	f	3%
1986	grd4	d	11	f	3%
1986	grd5	d	11	f	3%
1986	grd6	b	11	f	3%

#WPR -- workingDage labor force participation rate

-- year	course code	graduate or dropout	male, female, or each	participation rate
1986	grd1	d	m	95%
1986	grd2	d	m	95%
1986	grd3	d	m	95%
1986	grd4	d	m	95%
1986	grd5	d	m	95%
1986	grd6	b	m	93%
1986	gen7	d	m	93%
1986	gen8	d	m	93%
1986	gen9	b	m	98%
1986	ptti7	d	m	95%
1986	ptti8	d	m	95%
1986	ptti9	d	m	95%
1986	ptti10	d	m	95%
1986	ptti11	b	m	95%
1986	vtc7	d	m	95%
1986	vtc8	b	m	95%
1986	gen10	d	m	93%
1986	art11	d	m	93%
1986	art12	b	m	95%
1986	sci11	d	m	93%
1986	sci12	b	m	95%
1986	uptt10	d	m	90%
1986	uptt11	d	m	90%
1986	uptt12	b	m	95%
1986	isla10	d	m	93%
1986	isla11	d	m	93%
1986	isla12	b	m	95%
1986	issci11	d	m	93%
1986	issci12	b	m	95%
1986	agri10	d	m	93%
1986	agri11	d	m	93%
1986	agri12	b	m	98%

1986	comm10	d	m	93%
1986	comm11	d	m	93%
1986	comm12	b	m	98%
1986	intec10	d	m	93%
1986	intec11	d	m	93%
1986	intec12	b	m	98%
1986	sptt13	d	m	95%
1986	sptt14	b	m	95%
1986	ptech13	d	m	95%
1986	ptech14	b	m	95%
1986	med13	d	m	95%
1986	med14	d	m	95%
1986	med15	d	m	95%
1986	med16	d	m	100%
1986	med17	d	m	100%
1986	med18	d	m	100%
1986	eng13	d	m	95%
1986	eng14	d	m	95%
1986	eng15	d	m	95%
1986	eng16	b	m	95%
1986	sci13	d	m	95%
1986	sci14	d	m	95%
1986	sci15	d	m	95%
1986	sci16	b	m	95%
1986	agri13	d	m	95%
1986	agri14	d	m	95%
1986	agri15	d	m	95%
1986	agri16	b	m	100%
1986	lib13	d	m	95%
1986	lib14	d	m	95%
1986	lib15	d	m	95%
1986	lib16	b	m	99%
1986	busec13	d	m	95%
1986	busec14	d	m	95%
1986	busec15	d	m	95%
1986	busec16	b	m	99%

1986	lawsh13	d	m	95%
1986	lawsh14	d	m	95%
1986	lawsh15	d	m	95%
1986	lawsh16	b	m	100%
1986	edu13	d	m	95%
1986	edu14	d	m	95%
1986	edu15	d	m	95%
1986	edu16	b	m	100%
1986	grd1	d	f	10%
1986	grd2	d	f	10%
1986	grd3	d	f	10%
1986	grd4	d	f	10%
1986	grd5	d	f	10%
1986	grd6	d	f	10%
1986	grd6	g	f	15%
1986	gen7	d	f	10%
1986	gen8	d	f	10%
1986	gen9	d	f	10%
1986	gen9	g	f	15%
1986	ptti7	d	f	15%
1986	ptti8	d	f	15%
1986	ptti9	d	f	15%
1986	ptti10	d	f	15%
1986	ptti11	b	f	75%
1986	gen10	d	f	5%
1986	art11	d	f	5%
1986	art12	g	f	15%
1986	art12	d	f	5%
1986	sci11	d	f	50%
1986	sci12	g	f	20%
1986	sci12	d	f	5%
1986	uptt10	d	f	10%
1986	uptt11	d	f	10%
1986	uptt12	b	f	75%
1986	comm10	d	f	5%

1986	comm11	d	f	5%
1986	comm12	g	f	40%
1986	comm12	d	f	5%
1986	sptt13	d	f	80%
1986	sptt14	b	f	90%
1986	med13	d	f	5%
1986	med14	d	f	5%
1986	med15	d	f	5%
1986	med16	d	f	5%
1986	med17	d	f	5%
1986	med18	d	f	5%
1986	eng13	d	f	5%
1986	eng14	d	f	5%
1986	eng15	d	f	5%
1986	eng16	b	f	60%
1986	sci13	d	f	5%
1986	sci14	d	f	5%
1986	sci15	d	f	5%
1986	sci16	g	f	5%
1986	sci16	d	f	60%
1986	agri13	d	f	5%
1986	agri14	d	f	5%
1986	agri15	d	f	5%
1986	agri16	g	f	50%
1986	agri16	d	f	60%
1986	lib13	d	f	5%
1986	lib14	d	f	5%
1986	lib15	d	f	5%
1986	lib16	g	f	40%
1986	lib16	d	f	80%
1986	busec13	d	f	5%
1986	busec14	d	f	5%
1986	busec15	d	f	5%
1986	busec16	d	f	60%
1986	busec16	g	f	65%
1986	lawsh13	d	f	5%

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      1986   lawsh14   d      f      5%
      1986   lawsh15   d      f      5%
      1986   lawsh16   d      f      60%
      1986   lawsh16   g      f      5%
      1986   edu13     d      f      5%
      1986   edu14     d      f      5%
      1986   edu15     d      f      5%
      1986   edu16     b      f      80%

#UPPR -- unschooled persons labor force participation rate
--                    male,
--                    female,  participation
--      year  age  or each      rate
        1986  16   m            30%
        1986  17   m            35%
        1986  18   m            40%
        1986  19   m            50%
        1986  20   m            70%
        1986  21   m            90%
        1986  16   f            7%
        1986  17   f            8%
        1986  18   f            9%
        1986  19   f            10%
        1986  20   f            12%
        1986  21   f            15%

#SLP -- school leaver labor pool assignments
--              graduate  labor
--     course     or      pool
--      code    dropout   codes
        grd1      d       eight
        grd2      d       eight
        grd3      d       eight
        grd4      d       eight
        grd5      d       eight
        grd6      d       eight
```

grd6	g	seven	
ptti7	d	seven	
ptti8	d	seven	
ptti9	d	seven	
ptti10	d	seven	
ptti11	d	seven	
ptti11	g	four	
vtc7	d	seven	
vtc8	d	seven	
vtc8	g	six	
gen7	d	seven	
gen8	d	seven	
gen9	d	seven	
gen9	g	five	
gen10	d	five	
art11	d	five	six
art12	d	five	six
art12	g	five	four
sci11	d	five	six
sci12	d	five	six
sci12	g	five	three
uptt10	d	five	
uptt11	d	five	
uptt12	d	five	
uptt12	g	four	
isla10	d	five	
isla11	d	five	
isla12	d	five	
isla12	g	five	
issci11	d	five	
issci12	d	five	
issci12	g	five	
agri10	d	five	
agri11	d	five	
agri12	b	eight	six
comm10	d	five	

comm11	d	five
comm12	b	five
intec10	d	five
intec11	d	five
intec12	b	three six
sptt13	d	five
sptt14	b	four
ptech13	d	six
ptech14	b	three
med13	d	five
med14	d	three
med15	g	three
med15	d	three
med16	b	three
med17	b	three
med18	b	three
eng13	d	six
eng14	d	three
eng15	d	three
eng15	g	three
eng16	b	three
sci13	d	six
sci14	d	three
sci15	g	three
sci15	d	three
sci16	g	one two
sci16	d	three
agri13	d	six
agri14	d	three
agri15	d	three
agri16	d	three five
agri16	g	one two
lib13	d	five
lib14	d	five
lib15	d	five
lib16	g	two

lib16	d	five
busec13	d	five
busec14	d	five
busec15	d	five
busec16	g	two
busec16	d	five
lawsh13	d	five
lawsh14	d	five
lawsh15	d	five
lawsh16	d	five
lawsh16	g	two
edu13	d	five
edu14	d	five
edu15	d	five
edu16	d	five
edu16	g	two

#SLPAR -- school leaver labor pool assignment rates

-- year	course code	graduate or dropout	male, female, or each	assignment rates
1986	grd1	d	mf	100%
1986	grd2	d	mf	100%
1986	grd3	d	mf	100%
1986	grd4	d	mf	100%
1986	grd5	d	mf	100%
1986	grd6	b	mf	100%
1986	ptti7	d	mf	100%
1986	ptti8	d	mf	100%
1986	ptti9	d	mf	100%
1986	ptti10	d	mf	100%
1986	ptti11	g	mf	100%
1986	gen7	d	mf	100%
1986	gen8	d	mf	100%
1986	gen9	b	mf	100%

1986	gen10	d	mf	100%	
1986	art11	d	mf	100%	0%
1986	art12	d	mf	90%	10%
1986	art12	g	mf	90%	10%
1986	sci11	d	mf	100%	0%
1986	sci12	d	mf	90%	10%
1986	sci12	g	mf	90%	10%
1986	uptt10	d	mf	100%	
1986	uptt11	d	mf	100%	
1986	uptt12	g	mf	100%	
1986	isla10	d	m	100%	
1986	isla11	d	m	100%	
1986	isla12	b	m	100%	
1986	issci11	d	m	100%	
1986	issci12	b	m	100%	
1986	agri10	d	m	100%	
1986	agri11	d	m	100%	
1986	agri12	b	m	60%	40%
1986	comm10	d	mf	100%	
1986	comm11	d	mf	100%	
1986	comm12	b	mf	100%	
1986	intec10	d	m	100%	
1986	intec11	d	m	100%	
1986	intec12	b	m	60%	40%
1986	sptt13	d	b	100%	
1986	sptt14	b	b	100%	
1986	ptech13	d	m	100%	
1986	ptech14	b	m	100%	
1986	med13	d	mf	100%	
1986	med14	d	mf	100%	
1986	med15	b	mf	100%	
1986	med16	b	mf	100%	
1986	med17	b	mf	100%	
1986	med18	b	mf	100%	
1986	eng13	d	mf	100%	
1986	eng14	d	mf	100%	

1986	eng15	b	mf	100%	
1986	eng16	b	mf	100%	
1986	sci13	d	mf	100%	
1986	sci14	d	mf	100%	
1986	sci15	g	mf	100%	
1986	sci15	d	mf	100%	
1986	sci16	g	mf	80%	20%
1986	sci16	d	mf	100%	
1986	agri13	d	mf	100%	
1986	agri14	d	mf	100%	
1986	agri15	d	mf	100%	
1986	agri16	d	mf	70%	30%
1986	agri16	g	mf	80%	20%
1986	lib13	d	mf	100%	
1986	lib14	d	mf	100%	
1986	lib15	d	mf	100%	
1986	lib16	g	mf	100%	
1986	lib16	d	mf	100%	
1986	busec13	d	mf	100%	
1986	busec14	d	mf	100%	
1986	busec15	d	mf	100%	
1986	busec16	g	mf	100%	
1986	busec16	d	mf	100%	
1986	lawsh13	d	mf	100%	
1986	lawsh14	d	mf	100%	
1986	lawsh15	d	mf	100%	
1986	lawsh16	d	mf	100%	
1986	lawsh16	g	mf	100%	
1986	edu13	d	mf	100%	
1986	edu14	d	mf	100%	
1986	edu15	d	mf	100%	
1986	edu16	d	mf	100%	
1986	edu16	g	mf	100%	

```
#SLLR -- school leaver lag rates
--                                  fraction
--                labor   male,     waiting
--                pool    female,  (0 1 ...)
--       year     code    or each   years

#IWWSL -- initial waiting working age school leavers
--                                  number
--                labor   male,     waiting
--                pool    female,  (1 2 ...)
--       year     code    or each   years

#UPP -- unschooled persons labor pool assignments
--       labor
--       pool
--       codes
         eight

#UPPAR -- unschooled persons labor pool assignment rates
--                 male,
--                 female,  assignment
--       year      or each  rates
         1986      mf       100%

#INLF -- initial national labor force
--                                          number
--              sector      occupation      of
--       year   code        code            workers
         1986   agr         A-1             653
         1986   agr         A-2             373
         1986   agr         B-1             3641
         1986   agr         B-2             373
         1986   agr         C               2801
         1986   agr         D               1867
         1986   agr         E               3734
         1986   agr         F               920058
```

1986	m&q	A-1	64
1986	m&q	A-2	64
1986	m&q	B-1	64
1986	m&q	B-2	0
1986	m&q	C	96
1986	m&q	D	192
1986	m&q	E	358
1986	m&q	F	5562
1986	mfg	A-1	231
1986	mfg	A-2	289
1986	mfg	B-1	462
1986	mfg	B-2	347
1986	mfg	C	1734
1986	mfg	D	3468
1986	mfg	E	6936
1986	mfg	F	44333
1986	util	A-1	1542
1986	util	A-2	514
1986	util	B-1	2364
1986	util	B-2	1028
1986	util	C	3084
1986	util	D	12850
1986	util	E	8738
1986	util	F	21280
1986	con	A-1	111
1986	con	A-2	111
1986	con	B-1	111
1986	con	B-2	0
1986	con	C	775
1986	con	D	2214
1986	con	E	23996
1986	con	F	69383
1986	trh	A-1	125
1986	trh	A-2	125
1986	trh	B-1	376
1986	trh	B-2	2506

1986	trh	C	46361
1986	trh	D	1253
1986	trh	E	26313
1986	trh	F	48241
1986	t&c	A-1	90
1986	t&c	A-2	90
1986	t&c	B-1	225
1986	t&c	B-2	90
1986	t&c	C	810
1986	t&c	D	1890
1986	t&c	E	1080
1986	t&c	F	40725
1986	b&f	A-1	416
1986	b&f	A-2	832
1986	b&f	B-1	1040
1986	b&f	B-2	1248
1986	b&f	C	10608
1986	b&f	D	62
1986	b&f	E	874
1986	b&f	F	5720
1986	ser	A-1	6446
1986	ser	A-2	6446
1986	ser	B-1	11276
1986	ser	B-2	5530
1986	ser	C	51060
1986	ser	D	23998
1986	ser	E	10212
1986	ser	F	112332

#IELF -- initial expatriate labor force

-- year	sector code	occupation code	nationality code	number of workers
1986	**con**	**E**	**exp**	**7000**
1986	**con**	**F**	**exp**	**7000**
1986	**ser**	**A-1**	**exp**	**3000**
1986	**ser**	**A-2**	**exp**	**3000**
1986	**ser**	**B-1**	**exp**	**2000**
1986	**ser**	**B-2**	**exp**	**20000**

#NLF -- national labor force

-- year	sector code	occupation code	number of workers

#ELF -- expatriate labor force

-- year	sector code	occupation code	nationality code	number of workers

#NAR -- national attrition rates

-- year	sector code	occupation code	attrition rate
1986	**all**	**A-1**	**0.5%**
1986	**all**	**A-2**	**0.5%**
1986	**all**	**B-1**	**0.5%**
1986	**all**	**B-2**	**0.5%**
1986	**all**	**C**	**2%**
1986	**all**	**D**	**2%**
1986	**all**	**E**	**3%**
1986	**all**	**F**	**3%**

```
#EAR -- expatriate attrition rates
--              sector  occupation  nationality  attrition
--      year    code      code         code        rate
        1986    all       all          all         100%

#SOMP -- sector occupation mobility paths
--        sector
--        code  occupation   sector    occupation
--         of      code      code of    code of
--       source  of source  destination destination
          agr      A-1         agr         A-2

#SOMR -- sector occupation mobility rates
--        sector
--        code  occupation
--         of      code    mobility
--       year    source  of source   rates
          1986    agr       A-1       0%

#LP -- leaker labor pool assignments
--                          labor
--      sector  occupation   pool
--       code     code       codes
         agr      A-1        one

#LR -- leaker labor pool assignment rates
--                sector  occupation  leakage
--      year      code      code       rates
          1986    agr       A-1        0%

#LLR -- leaker lag rates
--                      fraction
--              labor   waiting
--              pool    (0 1 ...)
--      year    code    years
```

```
#IWL -- initial waiting leakers
--                      number
--              labor   waiting
--              pool    (1 2 ...)
--      year    code    years

#OMR -- outmigration rates
--              sector  occupation  outmigration
--      year    code    code        rate
        1986    agr     F           0%

#OMLR -- outmigration lag rates
--                      fraction
--              labor   waiting
--              pool    (0 1 ...)
--      year    code    years
        1986    eight   10%  10%  10%  10%  10%  10%  10%  10%
        1986    seven   10%  10%  10%  10%  10%  10%  10%  10%

#IWOM -- initial waiting outmigrants
--                      number
--              labor   waiting
--              pool    (1 2 ...)
--      year    code    years
        1985    eight   15000 15000 15000 15000 15000 15000 15000
        1985    seven   15000 15000 15000 15000 15000 15000 15000

#LSP -- labor source pools
--                              labor
--                              source
--      sector  occupation      pool
--      code    code            code
        agr     A-1             one
        agr     A-2             two
        agr     B-1             three
        agr     B-2             four
```

agr	C	five
agr	D	six
agr	E	seven
agr	F	eight
m&q	A-1	one
m&q	A-2	two
m&q	B-1	three
m&q	B-2	four
m&q	C	five
m&q	D	six
m&q	E	seven
m&q	F	eight
mfg	A-1	one
mfg	A-2	two
mfg	B-1	three
mfg	B-2	four
mfg	C	five
mfg	D	six
mfg	E	seven
mfg	F	eight
util	A-1	one
util	A-2	two
util	B-1	three
util	B-2	four
util	C	five
util	D	six
util	E	seven
util	F	eight
con	A-1	one
con	A-2	two
con	B-1	three
con	B-2	five
con	C	five
con	D	six
con	E	seven
con	F	eight

trh	A-1	one
trh	A-2	two
trh	B-1	three
trh	B-2	four
trh	C	five
trh	D	six
trh	E	seven
trh	F	eight
t&c	A-1	one
t&c	A-2	two
t&c	B-1	three
t&c	B-2	four
t&c	C	five
t&c	D	six
t&c	E	seven
t&c	F	eight
b&f	A-1	one
b&f	A-2	two
b&f	B-1	three
b&f	B-2	four
b&f	C	five
b&f	D	six
b&f	E	seven
b&f	F	eight
ser	A-1	one
ser	A-2	two
ser	B-1	three
ser	B-2	four
ser	C	five
ser	D	six
ser	E	seven
ser	F	eight

```
#IPS -- initial labor pool stocks
--              labor   male,    number
--              pool    female,    of
--      year    code    or each  workers
        1985    eight     m       50000
        1985    seven     m       40000

#CTP -- changes to labor pool stocks
--                                 number
--              labor   male,    entering
--              pool    female,     or
--      year    code    or each  leaving

#AF -- nationalization allocation fractions
--               demand   incidence
--              allocation allocation
--      year     fraction   fraction
        1986      100%        0%

#TNF -- target nationalization fractions
--                                    target
--              sector occupation nationalization
--      year    code     code        fraction
        1986    all      all          100%

#MAP -- national manpower allocation priorities
--              sector occupation  priority
--      year    code     code        value
        1986    all      all           1
```

```
#WIA -- expatriate worker importation allowed
--                importation
--       year      allowed?
         1986         y
         1987         y
         1988         y
         1989         y
         1990         y
         1991         y
         1992         y
         1993         y
         1994         y
         1995         y

#MIE -- maximum importation of expatriates
--                                maximum
--                nationality     number
--       year       code         imported

#MTE -- maximum total expatriates
--                                maximum
--                nationality      total
--       year       code          number

#MIEP -- maximum importation of expatriates by pool
--                labor                  maximum
--                pool    nationality    number
--       year     code      code        imported

#MTEP -- maximum total expatriates by pool
--                labor                  maximum
--                pool    nationality     total
--       year     code      code         number
```

#EWD -- expatriate worker distribution

--	sector	occupation	distribution	nationality	nationality
--	year	code	code	rate type	code	fraction
	1986	**all**	**all**	**n**	**exp**	**100%**

#EOR -- expatriate overage rates

--					overage	
--		sector	occupation	nationality	rate	overage
--	year	code	code	code	type	rate

-- end of data --

Manpower Requirements Model
MRM
Reports

Simulation Mrmotpt

Edited data file:
produced from:
manpower requirements data file:

Manpower Requirements Data Description:
Manpower Requirements Data for the YAR Test Dataset

Results file:
containing:
Manpower Requirements Simulation results
produced from:
edited data file:
with parameters:
Base year of simulation: 1986
Number of years of simulation: 6
Simulate with missing data not selected.

Loading printer parameters from file printpar.mem

-- printer parameters for the Manpower and Education Model

page width 132	-- columns on a page
page length 66	-- lines on a page
form feed yes	-- use form feed character ^L to cause top of page

-- specify "form feed no" if form feed character ^L is not to be used
-- and instead pagination of output is to be handled by counting lines

Reports Produced:

OEPSY	for 1986 1987 1988 1989 1990 1991
OSY	for 1986 1987 1988 1989 1990 1991
ESY	for 1986 1987 1988 1989 1990 1991
PSY	for 1986 1987 1988 1989 1990 1991
MRSO	for 1986 1987 1988 1989 1990 1991
MRSY	for 1986 1987 1988 1989 1990 1991
MROY	for 1986 1987 1988 1989 1990 1991

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Output, Employment, and Productivity by Sector and Year for 1986-1991
(OEPSY)

Sector	Year 1986	1987	1988	1989	1990	1991
agriculture and fishing						
Output: YEMENI RIYALS ('000s)	10680	11000	11330	11670	12020	12381
percentage share	30.3%	29.3%	28.1%	26.9%	25.5%	23.9%
growth rate	na	3.0%	3.0%	3.0%	3.0%	3.0%
Employment Elasticity	na	0.426	0.426	0.426	0.426	0.426
Employment: number of workers	933500	945433	957518	969757	982154	994708
percentage share	58.1%	57.1%	56.0%	54.9%	53.8%	52.6%
growth rate	na	1.3%	1.3%	1.3%	1.3%	1.3%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.01144	0.01164	0.01183	0.01203	0.01224	0.01245
growth rate	na	1.7%	1.7%	1.7%	1.7%	1.7%
mining and quarrying						
Output: YEMENI RIYALS ('000s)	506	807.58	1288.9	2057.1	3283.1	5239.8
percentage share	1.4%	2.1%	3.2%	4.7%	7.0%	10.1%
growth rate	na	59.6%	59.6%	59.6%	59.6%	59.6%
Employment Elasticity	na	0.419	0.419	0.419	0.419	0.419
Employment: number of workers	6400	7999	9997	12494	15615	19516
percentage share	0.4%	0.5%	0.6%	0.7%	0.9%	1.0%
growth rate	na	25.0%	25.0%	25.0%	25.0%	25.0%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.07906	0.101	0.1289	0.1646	0.2102	0.2685
growth rate	na	27.7%	27.7%	27.7%	27.7%	27.7%

manufacturing						
Output: YEMENI RIYALS ('000s)	4620	5035.8	5489	5983	6521.5	7108.4
percentage share	13.1%	13.4%	13.6%	13.8%	13.8%	13.7%
growth rate	na	9.0%	9.0%	9.0%	9.0%	9.0%
Employment Elasticity	na	0.94	0.94	0.94	0.94	0.94
Employment: number of workers	57800	62689	67991	73741	79978	86742
percentage share	3.6%	3.8%	4.0%	4.2%	4.4%	4.6%
growth rate	na	8.5%	8.5%	8.5%	8.5%	8.5%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.07993	0.08033	0.08073	0.08114	0.08154	0.08195
growth rate	na	0.5%	0.5%	0.5%	0.5%	0.5%
utilities-electricity and water						
Output: YEMENI RIYALS ('000s)	220	253	290.95	334.59	384.78	442.5
percentage share	0.6%	0.7%	0.7%	0.8%	0.8%	0.9%
growth rate	na	15.0%	15.0%	15.0%	15.0%	15.0%
Employment Elasticity	na	0.297	0.297	0.297	0.297	0.297
Employment: number of workers	51400	53688	56077	58573	61179	63902
percentage share	3.2%	3.2%	3.3%	3.3%	3.3%	3.4%
growth rate	na	4.5%	4.5%	4.5%	4.5%	4.5%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.00428	0.004712	0.005188	0.005712	0.006289	0.006925
growth rate	na	10.1%	10.1%	10.1%	10.1%	10.1%
construction						
Output: YEMENI RIYALS ('000s)	1285	1351.8	1422.1	1496.1	1573.9	1655.7
percentage share	3.6%	3.6%	3.5%	3.4%	3.3%	3.2%
growth rate	na	5.2%	5.2%	5.2%	5.2%	5.2%
Employment Elasticity	na	0.721	0.721	0.721	0.721	0.721
Employment: number of workers	110700	114849	119153	123618	128250	133057
percentage share	6.9%	6.9%	7.0%	7.0%	7.0%	7.0%
growth rate	na	3.7%	3.7%	3.7%	3.7%	3.7%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.01161	0.01177	0.01194	0.0121	0.01227	0.01244
growth rate	na	1.4%	1.4%	1.4%	1.4%	1.4%

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Output, Employment, and Productivity by Sector and Year for 1986-1991
(OEPSY)

Sector	Year 1986	1987	1988	1989	1990	1991
trades & hotels						
Output: YEMENI RIYALS ('000s)	4896	5175.1	5470.1	5781.8	6111.4	6459.8
percentage share	13.9%	13.8%	13.6%	13.3%	13.0%	12.5%
growth rate	na	5.7%	5.7%	5.7%	5.7%	5.7%
Employment Elasticity	na	0.654	0.654	0.654	0.654	0.654
Employment: number of workers	125300	129973	134819	139847	145062	150472
percentage share	7.8%	7.8%	7.9%	7.9%	7.9%	8.0%
growth rate	na	3.7%	3.7%	3.7%	3.7%	3.7%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.03907	0.03982	0.04057	0.04134	0.04213	0.04293
growth rate	na	1.9%	1.9%	1.9%	1.9%	1.9%
transportation and communication						
Output: YEMENI RIYALS ('000s)	4106	4401.6	4718.5	5058.3	5422.5	5812.9
percentage share	11.7%	11.7%	11.7%	11.7%	11.5%	11.2%
growth rate	na	7.2%	7.2%	7.2%	7.2%	7.2%
Employment Elasticity	na	0.708	0.708	0.708	0.708	0.708
Employment: number of workers	45000	47294	49705	52239	54902	57701
percentage share	2.8%	2.9%	2.9%	3.0%	3.0%	3.1%
growth rate	na	5.1%	5.1%	5.1%	5.1%	5.1%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.09124	0.09307	0.09493	0.09683	0.09877	0.1007
growth rate	na	2.0%	2.0%	2.0%	2.0%	2.0%

banking, finance, business services						
Output: YEMENI RIYALS ('000s)	4166	4436.8	4725.2	5032.3	5359.4	5707.8
percentage share	11.8%	11.8%	11.7%	11.6%	11.4%	11.0%
growth rate	na	6.5%	6.5%	6.5%	6.5%	6.5%
Employment Elasticity	na	0.838	0.838	0.838	0.838	0.838
Employment: number of workers	20800	21933	23127	24386	25714	27115
percentage share	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%
growth rate	na	5.4%	5.4%	5.4%	5.4%	5.4%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.2003	0.2023	0.2043	0.2064	0.2084	0.2105
growth rate	na	1.0%	1.0%	1.0%	1.0%	1.0%
private and public services						
Output: YEMENI RIYALS ('000s)	4746	5130.4	5546	5995.2	6480.8	7005.8
percentage share	13.5%	13.6%	13.8%	13.8%	13.7%	13.5%
growth rate	na	8.1%	8.1%	8.1%	8.1%	8.1%
Employment Elasticity	na	0.855	0.855	0.855	0.855	0.855
Employment: number of workers	255300	272977	291877	312086	333694	356799
percentage share	15.9%	16.5%	17.1%	17.7%	18.3%	18.9%
growth rate	na	6.9%	6.9%	6.9%	6.9%	6.9%
Productivity:						
YEMENI RIYALS ('000s)						
per worker	0.01859	0.01879	0.019	0.01921	0.01942	0.01964
growth rate	na	1.1%	1.1%	1.1%	1.1%	1.1%
total						
Output: YEMENI RIYALS ('000s)	35225	37593	40281	43409	47158	51814
percentage share	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
growth rate	na	6.7%	7.2%	7.8%	8.6%	9.9%
Employment Elasticity	na	0.469	0.451	0.425	0.392	0.352
Employment: number of workers	1606200	1656832	1710263	1766742	1826550	1890012
percentage share	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
growth rate	na	3.2%	3.2%	3.3%	3.4%	3.5%
Productivity:						
YEMENI RIYALS ('000s) per worker	0.02193	0.02269	0.02355	0.02457	0.02582	0.02741
growth rate	na	3.5%	3.8%	4.3%	5.1%	6.2%

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Output by Sector and Year for 1986-1991
(OSY)

Sector	Year 1986	1987	1988	1989	1990	1991
agriculture and fishing						
Output: YEMENI RIYALS ('000s)	10680	11000	11330	11670	12020	12381
percentage share	30.3%	29.3%	28.1%	26.9%	25.5%	23.9%
growth rate	na	3.0%	3.0%	3.0%	3.0%	3.0%
Employment Elasticity	na	0.426	0.426	0.426	0.426	0.426
mining and quarrying						
Output: YEMENI RIYALS ('000s)	506	807.58	1288.9	2 057.1	3283.1	5239.8
percentage share	1.4%	2.1%	3.2%	4.7%	7.0%	10.1%
growth rate	na	59.6%	59.6%	59.6%	59.6%	59.6%
Employment Elasticity	na	0.419	0.419	0.419	0.419	0.419
manufacturing						
Output: YEMENI RIYALS ('000s)	4620	5035.8	5489	5983	6521.5	7108.4
percentage share	13.1%	13.4%	13.6%	13.8%	13.8%	13.7%
growth rate	na	9.0%	9.0%	9.0%	9.0%	9.0%
Employment Elasticity	na	0.94	0.94	0.94	0.94	0.94
utilities-electricity and water						
Output: YEMENI RIYALS ('000s)	220	253	290.95	334.59	384.78	442.5
percentage share	0.6%	0.7%	0.7%	0.8%	0.8%	0.9%
growth rate	na	15.0%	15.0%	15.0%	15.0%	15.0%
Employment Elasticity	na	0.297	0.297	0.297	0.297	0.297

construction						
Output: YEMENI RIYALS ('000s)	1285	1351.8	1422.1	1496.1	1573.9	1655.7
percentage share	3.6%	3.6%	3.5%	3.4%	3.3%	3.2%
growth rate	na	5.2%	5.2%	5.2%	5.2%	5.2%
Employment Elasticity	na	0.721	0.721	0.721	0.721	0.721
trades & hotels						
Output: YEMENI RIYALS ('000s)	4896	5175.1	5470.1	5781.8	6111.4	6459.8
percentage share	13.9%	13.8%	13.6%	13.3%	13.0%	12.5%
growth rate	na	5.7%	5.7%	5.7%	5.7%	5.7%
Employment Elasticity	na	0.654	0.654	0.654	0.654	0.654
transportation and communication						
Output: YEMENI RIYALS ('000s)	4106	4401.6	4718.5	5058.3	5422.5	5812.9
percentage share	11.7%	11.7%	11.7%	11.7%	11.5%	11.2%
growth rate	na	7.2%	7.2%	7.2%	7.2%	7.2%
Employment Elasticity	na	0.708	0.708	0.708	0.708	0.708
banking, finance, business services						
Output: YEMENI RIYALS ('000s)	4166	4436.8	4725.2	5032.3	5359.4	5707.8
percentage share	11.8%	11.8%	11.7%	11.6%	11.4%	11.0%
growth rate	na	6.5%	6.5%	6.5%	6.5%	6.5%
Employment Elasticity	na	0.838	0.838	0.838	0.838	0.838
private and public services						
Output: YEMENI RIYALS ('000s)	4746	5130.4	5546	5995.2	6480.8	7005.8
percentage share	13.5%	13.6%	13.8%	13.8%	13.7%	13.5%
growth rate	na	8.1%	8.1%	8.1%	8.1%	8.1%
Employment Elasticity	na	0.855	0.855	0.855	0.855	0.855
total						
Output: YEMENI RIYALS ('000s)	35225	37593	40281	43409	47158	51814
percentage share	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
growth rate	na	6.7%	7.2%	7.8%	8.6%	9.9%
Employment Elasticity	na	0.469	0.451	0.425	0.392	0.352

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Employment by Sector and Year for 1986-1991
(ESY)

	Year					
Sector	1986	1987	1988	1989	1990	1991
agriculture and fishing						
Employment: number of workers	933500	945433	957518	969757	982154	994708
percentage share	58.1%	57.1%	56.0%	54.9%	53.8%	52.6%
growth rate	na	1.3%	1.3%	1.3%	1.3%	1.3%
mining and quarrying						
Employment: number of workers	6400	7999	9997	12494	15615	19516
percentage share	0.4%	0.5%	0.6%	0.7%	0.9%	1.0%
growth rate	na	25.0%	25.0%	25.0%	25.0%	25.0%
manufacturing						
Employment: number of workers	57800	62689	67991	73741	79978	86742
percentage share	3.6%	3.8%	4.0%	4.2%	4.4%	4.6%
growth rate	na	8.5%	8.5%	8.5%	8.5%	8.5%
utilities-electricity and water						
Employment: number of workers	51400	53688	56077	58573	61179	63902
percentage share	3.2%	3.2%	3.3%	3.3%	3.3%	3.4%
growth rate	na	4.5%	4.5%	4.5%	4.5%	4.5%
construction						
Employment: number of workers	110700	114849	119153	123618	128250	133057
percentage share	6.9%	6.9%	7.0%	7.0%	7.0%	7.0%
growth rate	na	3.7%	3.7%	3.7%	3.7%	3.7%

trades & hotels						
Employment: number of workers	125300	129973	134819	139847	145062	150472
percentage share	7.8%	7.8%	7.9%	7.9%	7.9%	8.0%
growth rate	na	3.7%	3.7%	3.7%	3.7%	3.7%
transportation and communication						
Employment: number of workers	45000	47294	49705	52239	54902	57701
percentage share	2.8%	2.9%	2.9%	3.0%	3.0%	3.1%
growth rate	na	5.1%	5.1%	5.1%	5.1%	5.1%
banking, finance, business services						
Employment: number of workers	20800	21933	23127	24386	25714	27115
percentage share	1.3%	1.3%	1.4%	1.4%	1.4%	1.4%
growth rate	na	5.4%	5.4%	5.4%	5.4%	5.4%
private and public services						
Employment: number of workers	255300	272977	291877	312086	333694	356799
percentage share	15.9%	16.5%	17.1%	17.7%	18.3%	18.9%
growth rate	na	6.9%	6.9%	6.9%	6.9%	6.9%
total						
Employment:						
number of workers	1606200	1656832	1710263	1766742	1826550	1890012
percentage share	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
growth rate	na	3.2%	3.2%	3.3%	3.4%	3.5%

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Productivity by Sector and Year for 1986-1991
(PSY)

Sector	Year 1986	1987	1988	1989	1990	1991
agriculture and fishing						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.01144	0.01164	0.01183	0.01203	0.01224	0.01245
growth rate	na	1.7%	1.7%	1.7%	1.7%	1.7%
mining and quarrying						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.07906	0.101	0.1289	0.1646	0.2102	0.2685
growth rate	na	27.7%	27.7%	27.7%	27.7%	27.7%
manufacturing						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.07993	0.08033	0.08073	0.08114	0.08154	0.08195
growth rate	na	0.5%	0.5%	0.5%	0.5%	0.5%
utilities-electricity and water						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.00428	0.004712	0.005188	0.05712	0.006289	0.006925
growth rate	na	10.1%	10.1%	10.1%	10.1%	10.1%
construction						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.01161	0.01177	0.01194	0.0121	0.01227	0.01244
growth rate	na	1.4%	1.4%	1.4%	1.4%	1.4%

trades & hotels						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.03907	0.03982	0.04057	0.04134	0.04213	0.04293
growth rate	na	1.9%	1.9%	1.9%	1.9%	1.9%
transportation and communication						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.09124	0.09307	0.09493	0.09683	0.09877	0.1007
growth rate	na	2.0%	2.0%	2.0%	2.0%	2.0%
banking, finance, business services						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.2003	0.2023	0.2043	0.2064	0.2084	0.2105
growth rate	na	1.0%	1.0%	1.0%	1.0%	1.0%
private and public services						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.01859	0.01879	0.019	0.01921	0.01942	0.01964
growth rate	na	1.1%	1.1%	1.1%	1.1%	1.1%
total						
Productivity:						
YEMENI RIYALS ('000s) per worker	0.02193	0.02269	0.02355	0.02457	0.02582	0.02741
growth rate	na	3.5%	3.8%	4.3%	5.1%	6.2%

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1986
(MRSO)

Sector	Occupation								
	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	653	373	3641	373	2801	1867	3734	920058	933500
mining and quarrying	64	64	64	0	96	192	358	5562	6400
manufacturing	231	289	462	347	1734	3468	6936	44333	57800
utilities-electricity and water	1542	514	2364	1028	3084	12850	8738	21280	51400
construction	111	111	111	0	775	2214	30996	76383	110700
trades & hotels	125	125	376	2506	46361	1253	26313	48241	125300
transportation and communication	90	90	225	90	810	1890	1080	40725	45000
banking,finance, business services	416	832	1040	1248	10608	62	874	5720	20800
private and public services	9446	9446	13276	25530	51060	23998	10212	112332	255300
total	12679	11845	21559	31122	117328	47795	89241	1274632	1606200

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1987
(MRSO)

Sector	Occupation								
	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	662	378	3687	378	2836	1891	3782	931818	945433
mining and quarrying	80	80	80	0	120	240	448	6951	7999
manufacturing	251	313	502	376	1881	3761	7523	48082	62689
utilities-electricity and water	1611	537	2470	1074	3221	13422	9127	22227	53688
construction	115	115	115	0	804	2297	32158	79245	114849
trades & hotels	130	130	390	2599	48090	1300	27294	50039	129973
transportation and communication	95	95	236	95	851	1986	1135	42801	47294
banking,finance, business services	439	877	1097	1316	11186	66	921	6031	21933
private and public services	10100	10100	14195	27298	54595	25660	10919	120110	272977
total	13481	12625	22771	33136	123584	50623	93306	1307305	1656832

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1988
(MRSO)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	670	383	3734	383	2873	1915	3830	943730	957518
mining and quarrying	100	100	100	0	150	300	560	8687	9997
manufacturing	272	340	544	408	2040	4079	8159	52149	67991
utilities-electricity and water	1682	561	2580	1122	3365	14019	9533	23216	56077
construction	119	119	119	0	834	2383	33363	82215	119153
trades & hotels	135	135	404	2696	49883	1348	28312	51906	134819
transportation and communication	99	99	249	99	895	2088	1193	44983	49705
banking,finance, business services	463	925	1156	1388	11795	69	971	6360	23127
private and public services	10799	10799	15178	29188	58375	27436	11675	128426	291877
total	14340	13462	24064	35284	130209	53638	97596	1341671	1710263

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1989
(MRSO)

Sector	Occupation								
	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	679	388	3782	388	2909	1940	3879	955793	969757
mining and quarrying	125	125	125	0	187	375	700	10857	12494
manufacturing	295	369	590	442	2212	4424	8849	56559	73741
utilities-electricity and water	1757	586	2694	1171	3514	14643	9957	24249	58573
construction	124	124	124	0	865	2472	34613	85296	123618
trades & hotels	140	140	420	2797	51743	1398	29368	53841	139847
transportation and communication	104	104	261	104	940	2194	1254	47276	52239
banking,finance, business services	488	975	1219	1463	12437	73	1024	6706	24386
private and public services	11547	11547	16228	31209	62417	29336	12483	137318	312086
total	15259	14358	25443	37575	137227	56856	102127	1377897	1766742

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1990
(MRSO)

Sector	Occupation								
	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	688	393	3830	393	2946	1964	3929	968011	982154
mining and quarrying	156	156	156	0	234	468	874	13570	15615
manufacturing	320	400	640	480	2399	4799	9597	61343	79978
utilities-electricity and water	1835	612	2814	1224	3671	15295	10400	25328	61179
construction	128	128	128	0	898	2565	35910	88493	128250
trades & hotels	145	145	435	2901	53673	1451	30463	55849	1450€2
transportation and communication	110	110	275	110	988	2306	1318	49687	54902
banking,finance, business services	514	1029	1286	1543	13114	77	1080	7071	25714
private and public services	12347	12347	17352	33369	66739	31367	13348	146826	333694
total	16243	15319	26916	40020	144663	60292	106920	1416177	1826550

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

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Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Occupation for 1991
(MRSO)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing	696	398	3879	398	2984	1989	3979	980384	994708
mining and quarrying	195	195	195	0	293	585	1093	16959	19516
manufacturing	347	434	694	520	2602	5205	10409	66531	86742
utilities-electricity and water	1917	639	2940	1278	3834	15976	10863	26456	63902
construction	133	133	133	0	931	2661	37256	91809	133057
trades & hotels	150	150	451	3009	55675	1505	31599	57932	150472
transportation and communication	115	115	289	115	1039	2423	1385	52220	57701
banking,finance, business services	542	1085	1356	1627	13828	81	1139	7457	27115
private and public services	13202	13202	18554	35680	71360	33539	14272	156992	356799
total	17298	16351	28490	42628	152546	63965	111995	1456739	1890012

occupation key

A-1 university science/math based professionals
A-2 university non-science/math based professional
B-1 science/math based technician with post-secondary
B-2 non-science/math based sub-professional with post-secondary
C skilled and semi-skilled office
D skilled and semi-skilled manual
E semi-skilled requiring functional literacy plus OJT
F unskilled requiring no special education or training

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Sector and Year for 1986-1991
(MRSY)

Sector	Year					
	1986	1987	1988	1989	1990	1991
agriculture and fishing	933500	945433	957518	969757	982154	994708
mining and quarrying	6400	7999	9997	12494	15615	19516
manufacturing	57800	62689	67991	73741	79978	86742
utilities-electricity and water	51400	53688	56077	58573	61179	63902
construction	110700	114849	119153	123618	128250	133057
trades & hotels	125300	129973	134819	139847	145062	150472
transportation and communication	45000	47294	49705	52239	54902	57701
banking,finance, business services	20800	21933	23127	24386	25714	27115
private and public services	255300	272977	291877	312086	333694	356799
total	1606200	1656832	1710263	1766742	1826550	1890012

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Manpower Requirements by Occupation and Year for 1986-1991
(MROY)

Occupation	Year 1986	1987	1988	1989	1990	1991
university science/ math based professionals	12679	13481	14340	15259	16243	17298
university non-science/ math based professional	11845	12625	13462	14358	15319	16351
science/math based technician with post-secondary	21559	22771	24064	25443	26916	28490
non-science/math based sub-professional with post-secondary	31122	33136	35284	37575	40020	42628
skilled and semi-skilled office	117328	123584	130209	137227	144663	152546
skilled and semi-skilled manual	47795	50623	53638	56856	60292	63965
semi-skilled requiring functional literacy plus OJT	89241	93306	97596	102127	106920	111995
unskilled requiring no special education or training	1274632	1307305	1341671	1377897	1416177	1456739
total	1606200	1656832	1710263	1766742	1826550	1890012

End of Report Generation Report

Education Simulation Model
ESM
Selected Reports

Manpower and Education Model (version PC1.33)

Report Generation Report

Simulation Esmotpt

Edited data file:
Produced from:
Education Simulation Data File:

Education Simulation Data Description:
Education Projection is based on YAR3 with updating and changes.
Changes included enrollment in the University faculties by year.
It also includes fine tuning of the flow of students into the university faculties taking into consideration each faculty present capacity.

Sources:
Educational Statistical Yearbook, MOE, 1987
Education in 25 years of the revolution, MOE, 1988
Statistical Year Book 1986, CPO

Assumptions:
Constant efficiency rates
Constant disposition rates

Results file:
Containing:
Education Simulation results produced from:
Edited data file with parameters:
Base year of simulation: 1986
Number of years of simulation: 6
Simulate with missing data not selected.

Loading printer parameters from file printpar.mem

-- printer parameters for the Manpower and Education Model

page width 132 -- columns on a page
page length 66 -- lines on a page
form feed yes -- use form feed character ^L to cause top of page

-- specify "form feed no" if form feed character ^L is not to be used
-- and instead pagination of output is to be handled by counting lines

Reports Produced:

ECY for 1986 1987 1988 1989 1990 1991
ECLY for 1986 1987 1988 1989 1990 1991
GTCY for 1986 1987 1988 1989 1990 1991
SLCY for 1986 1987 1988 1989 1990 1991

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Enrollment Summary by Course and Year for 1986-1991
(ECY)

Course			Year					
			1986	1987	1988	1989	1990	1991
grd1	grade 1	male	180180	218017	232482	243056	253257	263734
		female	64597	80168	86409	92237	98386	104940
		total	244777	298185	318891	335292	351643	368674
grd2	grade 2	male	155447	143473	169140	181976	190767	198889
		female	49236	57862	71614	77745	83066	88612
		total	204683	201334	240754	259721	273833	287502
grd3	grade 3	male	140983	148325	139993	159111	172630	181961
		female	39629	39713	45847	56348	61960	66412
		total	180612	188038	185841	215458	234590	248373
grd4	grade 4	male	113743	116294	121912	116644	129723	141158
		female	25647	33498	34115	39066	47813	52915
		total	139390	149793	156027	155710	177536	194073
grd5	grade 5	male	91195	95790	98168	102707	99059	108802
		female	18036	19187	24886	25558	29150	35591
		total	109231	114977	123054	128266	128209	144394
grd6	grade 6	male	93307	78533	81516	83592	87373	84607
		female	13723	14574	15503	19938	20677	23479
		total	107030	93107	97019	103529	108049	108086
gen7	general 7	male	59623	68011	59026	60111	61600	64263
		female	7479	8308	8867	9436	11899	12593
		total	67102	76319	67893	69546	73498	76856
gen8	general 8	male	35977	49497	56884	50065	50592	51809
		female	3985	6033	6782	7255	7723	9667
		total	39962	55530	63666	57320	58314	61476
gen9	general 9	male	26408	34492	47307	54980	49457	49489

		female	3215	4029	5974	6932	7497	7998
		total	29623	38521	53280	61912	56954	57487
ptti7	primary	male	1700	2783	2477	2530	2594	2706
	teacher tra.	female	720	895	964	1027	1299	1371
		total	2420	3678	3441	3557	3893	4076
ptti8	primary	male	1600	1440	2298	2097	2129	2181
	teacher tra.	female	700	611	747	809	862	1082
		total	2300	2051	3045	2905	2991	3264
p\ '9	primary	male	1500	1560	1421	2182	2062	2081
	teacher tra.	female	680	684	605	721	785	838
		total	2180	2244	2025	2902	2847	2919
ptti10	primary	male	1400	1387	1437	1323	1960	1909
	teacher tra.	female	650	630	632	565	658	720
		total	2050	2017	2069	1887	2618	2629
ptti11	primary	male	1300	1294	1282	1324	1230	1765
	teacher tra.	female	717	610	584	584	527	601
		total	2017	1904	1867	1908	1757	2366
vtc7	vocational tech7	male	500	693	605	619	635	662
vtc8	vocational tech8	male	476	415	573	502	513	526
gen10	general10	male	15960	21199	27717	37906	44509	40871
		female	1923	2167	2703	3982	4663	5061
		total	17883	23366	30420	41888	49173	45932
art1i	art11	male	6000	5028	6502	8497	11597	13715
		female	427	874	992	1236	1817	2135
		total	6427	5902	7495	9733	13414	15850

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
Enrollment Summary by Course and Year for 1986-1991
(ECY)

Course			Year 1986	1987	1988	1989	1990	1991
art12	art12	male	5000	5170	4382	5551	7245	9872
		female	338	370	752	868	1084	1592
		total	5338	5540	5134	6419	8329	11464
sci11	science11	male	4000	6106	8189	10728	14624	17375
		female	821	898	1011	1257	1842	2172
		total	4821	7004	9200	11984	16466	19547
sci12	science12	male	3000	3520	5288	7138	9368	12741
		female	719	807	887	1000	1241	1808
		total	3719	4327	6175	8139	10609	14549
uptt10	gen prim	male	400	690	917	1255	1478	1364
	teacher tra.	female	300	210	247	359	424	462
		total	700	900	1164	1615	1902	1827
uptt11	gen prim	male	350	375	624	842	1151	1371
	teacher tra.	female	200	275	206	230	328	393
		total	550	650	830	1072	1480	1765
uptt12	gen prim	male	250	323	351	565	772	1056
	teacher tra.	female	239	194	253	200	216	301
		total	489	516	604	766	988	1357
isla10	islamic 10	male	120	221	292	400	467	424
isla11	islamic art 11	male	61	45	81	108	148	173
isla12	islamic art 12	male	87	54	40	71	95	129
issci11	islamic science 11	male	59	67	123	163	223	262
issci12	islamic science 12	male	48	55	62	111	149	204
agri10	agriculture 10	male	130	236	318	436	516	483
agri11	agriculture 11	male	100	122	213	294	403	485
agri12	agriculture 12	male	72	81	98	169	235	322

comm10	commercial 10	male	250	224	290	397	463	419
		female	71	2	0	0	0	0
		total	321	226	290	397	463	419
comm11	commercial 11	male	225	244	220	282	385	451
		female	46	69	4	0	0	0
		total	271	313	224	282	385	451
comm12	commercial 12	male	143	221	243	221	279	380
		female	46	45	67	6	0	0
		total	189	266	310	227	279	380
intec10	industrial/ technica..	male	371	481	628	858	1013	943
intec11	industrial/ technica..	male	250	312	404	527	719	852
intec12	industrial/ technica..	male	150	242	303	393	513	698
sptt13	senior prim teachin..							
		male	0	0	51	105	168	219
		female	0	0	8	19	28	38
		total	0	0	59	124	195	257
sptt14	senior prim teachin..							
		male	0	0	0	43	94	152
		female	0	0	0	7	16	25
		total	0	0	0	50	110	177
ptech13	polytech yr 1	male	0	0	26	69	114	152
ptech14	polytech yr 2	male	0	0	0	21	56	94
med13	medicine yr 1	male	250	236	236	290	317	316
		female	70	71	70	67	64	65
		total	320	307	307	357	381	381

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Enrollment Summary by Course and Year for 1986-1991
(ECY)

Course			Year 1986	1987	1988	1989	1990	1991
med14	medicine yr 2	male	150	203	193	193	236	259
		female	21	67	68	67	64	61
		total	171	270	261	260	299	319
med15	medicine yr 3	male	14	143	196	187	187	227
		female	17	20	63	64	64	61
		total	31	163	259	252	250	288
med16	medicine yr 4	male	14	14	136	189	182	181
		female	5	16	19	60	61	60
		total	19	30	155	249	243	242
med17	medicine yr 5	male	0	13	13	129	182	176
		female	0	5	15	18	57	58
		total	0	18	29	147	239	234
med18	medicine yr 6	male	0	0	13	13	123	175
		female	0	0	5	15	17	54
		total	0	0	17	27	140	229
eng13	engineering yr 1	male	129	161	165	203	223	223
		female	19	21	21	20	19	19
		total	148	182	186	223	242	242
eng14	engineering yr 2	male	102	90	113	116	142	156
		female	5	13	15	15	14	13
		total	107	104	127	130	156	169
eng15	engineering yr 3	male	102	98	87	108	111	137
		female	0	5	13	14	14	13
		total	102	103	99	122	125	150

eng16	engineering yr 4	male	102	98	94	83	104	107
		female	0	0	5	12	13	13
		total	102	98	99	95	117	120
sci13	science yr 1	male	161	143	142	173	190	189
		female	42	47	47	45	43	43
		total	203	190	188	218	232	232
sci14	science yr 2	male	39	106	97	96	117	128
		female	15	18	20	20	19	18
		total	54	124	117	116	136	146
sci15	science yr 3	male	36	37	99	93	92	111
		female	16	14	17	19	19	18
		total	52	51	116	112	110	129
sci16	science yr 4	male	35	35	36	93	89	88
		female	13	15	13	15	17	17
		total	48	49	48	108	107	105
agri13	agriculture yr 1	male	136	161	164	202	221	220
		female	4	5	5	5	5	5
		total	140	166	170	207	226	225
agri14	agriculture yr 2	male	25	95	113	115	142	155
		female	1	3	4	4	3	3
		total	26	98	116	119	145	158
agri15	agriculture yr 3	male	25	24	90	107	109	134
		female	0	1	3	3	3	3
		total	25	25	93	111	113	138

Yemen Arab Republic
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Sana'a (November 1988)
Enrollment Summary by Course and Year for 1986-1991
(ECY)

Course			Year 1986	1987	1988	1989	1990	1991
agri16	agriculture yr 4	male	21	24	23	86	102	104
		female	0	0	1	3	3	3
		total	21	24	23	88	105	107
lib13	liberal arts yr 1	male	589	505	422	333	324	304
		female	205	161	147	165	154	148
		total	794	666	569	498	478	452
lib14	liberal arts yr 2	male	267	485	428	359	284	274
		female	102	169	137	124	138	130
		total	369	654	565	484	423	404
lib15	liberal arts yr 3	male	211	251	449	407	344	273
		female	57	95	157	131	118	131
		total	268	346	606	539	462	404
lib16	liberal arts yr 4	male	95	195	235	416	388	329
		female	32	53	88	146	126	113
		total	127	248	323	561	513	442
busec13	business/ econ yr 1	male	1662	1389	1269	1276	1286	1191
		female	194	161	157	168	163	165
		total	1856	1550	1426	1444	1448	1356
busec14	business/ econ yr 2	male	635	1528	1327	1209	1209	1217
		female	73	178	153	149	159	154
		total	708	1706	1480	1358	1367	1372

busec15	business/ econ yr 3	male	494	596	1405	1264	1151	1145
		female	59	69	164	146	141	150
		total	553	665	1568	1411	1292	1295
busec16	business/ econ yr 4	male	309	460	560	1292	1202	1096
		female	44	55	65	151	139	134
		total	353	515	624	1443	1342	1230
lawsh13	law and sharie yr 1	male	1656	1508	1354	1136	1147	1108
		female	44	50	50	54	53	53
		total	1700	1558	1404	1190	1199	1161
lawsh14	law and sharie yr 2	male	1209	1137	1037	932	785	785
		female	29	30	34	34	37	36
		total	1238	1167	1071	966	822	821
lawsh15	law and sharie yr 3	male	1008	1139	1080	987	888	751
		female	17	27	28	32	32	35
		total	1025	1165	1108	1019	921	786
lawsh16	law and sharie yr 4	male	632	939	1072	1026	940	846
		female	17	16	25	27	30	31
		total	649	955	1097	1052	970	877
edu13	education yr 1	male	904	802	734	669	688	668
		female	295	177	162	215	216	222
		total	1199	978	896	884	903	890
edu14	education yr 2	male	266	691	636	582	531	542
		female	96	226	144	129	168	170
		total	362	917	780	711	698	713
edu15	education yr 3	male	225	251	635	604	554	505
		female	48	89	208	140	123	157
		total	273	339	843	744	677	662
edu16	education yr 4	male	109	208	236	583	573	527
		female	23	44	82	191	135	117
		total	132	252	318	774	708	645

Yemen Arab Republic
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Sana'a (November 1988)
Enrollment Summary by Course Level and Year for 1986-1991
(ECLY)

Course Level			Year 1986	1987	1988	1989	1990	1991
elem	elementary	male	774855	800432	843211	887085	932809	979151
		female	210868	245002	278375	310891	341052	371950
		total	985723	1045434	1121586	1197976	1273861	1351100
inter	intermediate	male	130484	161572	173310	175732	172770	177391
		female	18146	21800	25154	27327	31248	34870
		total	148630	183372	198464	203059	204018	212262
sec	secondary	male	37026	45015	57286	76911	96352	104591
		female	5130	5910	7122	9139	11615	13924
		total	42156	50925	64408	86050	107967	118515
psec	post secondary	male	0	0	77	238	431	617
		female	0	0	8	25	44	63
		total	0	0	85	263	475	680
univart	university art	male	10271	12081	12878	13075	12293	11562
		female	1335	1600	1801	2002	1932	1946
		total	11606	13680	14679	15077	14225	13508
univsci	university science							
		male	1341	1681	2009	2476	2868	3087
		female	228	320	402	465	500	529
		total	1569	2001	2411	2941	3368	3616

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Sana'a (November 1988)
Graduates of Terminal Courses by Year for 1986-1991
(GTCY)

Terminal Course				Year 1986	1987	1988	1989	1990	1991
grd6	grade 6	male		na	17728	14921	15488	15882	16601
		female		na	2882	3061	3256	4187	4342
		total		na	20610	17982	18744	20069	20943
gen9	general 9	male		na	1320	1725	2365	2749	2473
		female		na	161	201	299	347	375
		total		na	1481	1926	2664	3096	2848
ptti11	primary teacher tra..								
		male		na	1105	1100	1090	1125	1046
		female		na	609	518	497	496	448
		total		na	1714	1618	1587	1622	1493
vtc8	vocational tech8	male		na	443	386	532	467	477
art12	art12	male		na	2450	2895	2760	3886	5579
		female		na	176	209	457	566	754
		total		na	2626	3104	3218	4451	6333
sci12	science12	male		na	600	1056	2115	3569	5621
		female		na	158	244	341	466	680
		total		na	758	1300	2456	4035	6301
uptt12	gen prim teacher tr..								
		male		na	213	274	298	480	657
		female		na	203	165	215	170	183
		total		na	416	439	514	651	840
isla12	islamic art 12	male		na	17	11	8	14	19
issci12	islamic science 12	male		na	16	19	21	38	51
agri12	agriculture 12	male		na	65	73	88	152	211

comm12	commercial 12	male	na	129	199	219	199	251
		female	na	44	43	63	6	0
		total	na	172	242	282	205	251
intec12	industrial/technica..	male	na	143	230	288	373	487
sptt14	senior prim teachin..							
		male	na	0	0	0	37	80
		female	na	0	0	0	6	14
		total	na	0	0	0	42	94
ptech14	polytech yr 2	male	na	0	0	0	19	50
med18	medicine yr 6							
		male	na	0	0	12	12	117
		female	na	0	0	4	14	16
		total	na	0	0	16	26	133
eng16	engineering yr 4							
		male	na	98	94	90	80	100
		female	na	0	0	4	12	13
		total	na	98	94	95	92	113
sci16	science yr 4	male	na	32	32	33	85	82
		female	na	12	14	12	14	16
		total	na	44	45	45	99	98
agri16	agriculture yr 4	male	na	20	23	21	82	97
		female	na	0	0	1	2	3
		total	na	20	23	22	84	100
lib16	liberal arts yr 4	male	na	86	175	212	374	349
		female	na	29	48	79	131	113
		total	na	114	223	291	505	462
busec16	business/econ yr 4							
		male	na	278	414	504	1163	1082
		female	na	40	50	58	136	125
		total	na	318	464	562	1299	1207
lawsh16	law and sharie yr 4	male	na	569	845	964	923	846
		female	na	15	15	23	24	27
		total	na	584	859	987	947	873
edu16	education yr 4	male	na	98	187	212	525	515
		female	na	21	40	74	172	122
		total	na	119	227	286	697	637

Yemen Arab Republic
Central Planning Organization
Sana'a (November 1988)
School Leaver Details by Course and Year for 1986-1991
(SLCY)

Course				Year 1986	1987	1988	1989	1990	1991
grd1	grade 1 graduate	male	na	0	0	0	0	0	0
		female	na	0	0	0	0	0	0
		total	na	0	0	0	0	0	0
	dropout	male	na	19820	23982	25573	26736	27858	
		female	na	4522	5612	6049	6457	6887	
		total	na	24342	29594	31622	33193	34745	
grd2	grade 2 graduate	male	na	0	0	0	0	0	0
		female	na	0	0	0	0	0	0
		total	na	0	0	0	0	0	0
	dropout	male	na	15545	14347	16914	18198	19077	
		female	na	11324	13308	16471	17881	19105	
		total	na	26869	27655	33385	36079	38182	
grd3	grade 3 graduate	male	na	0	0	0	0	0	0
		female	na	0	0	0	0	0	0
		total	na	0	0	0	0	0	0
	dropout	male	na	15508	16316	15399	17502	18989	
		female	na	3170	3177	3668	4508	4957	
		total	na	18678	19493	19067	22010	23946	
grd4	grade 4 graduate	male	na	0	0	0	0	0	0
		female	na	0	0	0	0	0	0
		total	na	0	0	0	0	0	0
	dropout	male	na	11374	11629	12191	11664	12972	
		female	na	5386	7035	7164	8204	10041	
		total	na	16760	18664	19355	19868	23013	

grd5	grade 5 graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	9120	9579	9817	10271	9906
		female	na	3427	3646	4728	4856	5538
		total	na	12546	13225	14545	15127	15444
grd6	grade 6 graduate	male	na	17728	14921	15488	15882	16601
		female	na	2882	3061	3256	4187	4342
		total	na	20610	17982	18744	20069	20943
	dropout	male	na	5598	4712	4891	5016	5242
		female	na	1921	2040	2170	2791	2895
		total	na	7520	6752	7061	7807	8137
gen7	general 7 graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	5962	6801	5903	6011	6160
		female	na	748	831	887	944	1190
		total	na	6710	7632	6789	6955	7350
gen8	general 8 graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	1799	2475	2844	2503	2530
		female	na	239	362	407	435	463
		total	na	2038	2837	3251	2939	2993
gen9	general 9 graduate	male	na	1320	1725	2365	2749	2473
		female	na	161	201	299	347	375
		total	na	1481	1926	2664	3096	2848
	dropout	male	na	1320	1725	2365	2749	2473
		female	na	322	403	597	693	750
		total	na	1642	2127	2963	3442	3223

ptti7	primary teacher tra..						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	170	278	248	253	259
	female	na	72	90	96	103	130
	total	na	242	368	344	356	389
ptti8	primary teacher tra..						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	80	72	115	105	106
	female	na	35	31	37	40	43
	total	na	115	103	152	145	150
ptti9	primary teacher tra..						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	105	109	99	153	144
	female	na	48	48	42	50	55
	total	na	153	157	142	203	199
ptti10	primary teacher tra..						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	98	97	101	93	137
	female	na	45	44	44	40	46
	total	na	144	141	145	132	183
ptti11	primary teacher tra..						
	graduate male	na	1105	1100	1090	1125	1046
	female	na	609	518	497	496	448
	total	na	1714	1618	1587	1622	1493
	dropout male	na	91	91	90	93	86
	female	na	50	43	41	41	37
	total	na	141	133	131	134	123

vtc7	vocational tech7							
		graduate male	na	0	0	0	0	0
		dropout male	na	50	69	61	62	63
vtc8	vocational tech8							
		graduate male	na	443	386	532	467	477
		dropout male	na	29	25	34	30	31
gen10	general10	graduate male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
		dropout male	na	4309	5724	7483	10235	12018
		female	na	96	108	135	199	233
		total	na	4405	5832	7619	10434	12251
art11	art11	graduate male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
		dropout male	na	720	603	780	1020	1392
		female	na	56	114	129	161	236
		total	na	776	717	909	1180	1628
art12	art12	graduate male	na	2450	2895	2760	3886	5579
		female	na	176	209	457	566	754
		total	na	2626	3104	3218	4451	6333
		dropout male	na	50	52	44	56	72
		female	na	3	4	8	9	11
		total	na	53	55	51	64	83
sci11	science11	graduate male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
		dropout male	na	320	488	655	858	1170
		female	na	25	27	30	38	55
		total	na	345	515	685	896	1225
sci12	science12	graduate male	na	600	1056	2115	3569	5621
		female	na	158	244	341	466	680
		total	na	758	1300	2456	4035	6301
		dropout male	na	60	70	106	143	187
		female	na	43	42	39	36	35
		total	na	103	112	145	179	222

uptt10	gen prim teacher tr..						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	20	34	46	63	74
		female	na	15	11	12	18	21
		total	na	35	45	58	81	95
uptt11	gen prim teacher tr..							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	18	19	31	42	58
		female	na	10	14	10	12	16
		total	na	28	33	41	54	74
uptt12	gen prim teacher tr..							
	graduate	male	na	213	274	298	480	657
		female	na	203	165	215	170	183
		total	na	416	439	514	651	840
	dropout	male	na	13	16	18	28	39
		female	na	12	10	13	10	11
		total	na	24	26	30	38	49
isla10	islamic 10	graduate	male	na	0	0	0	0	0
		dropout	male	na	6	11	15	20	23
isla11	islamic art 11								
		graduate	male	na	0	0	0	0	0
		dropout	male	na	7	5	9	12	16
isla12	islamic art 12								
		graduate	male	na	17	11	8	14	19
		dropout	male	na	4	3	2	4	5
issci11	islamic science 11								
		graduate	male	na	0	0	0	0	0
		dropout	male	na	6	7	14	18	25
issci12	islamic science 12								
		graduate	male	na	16	19	21	38	51
		dropout	male	na	4	4	5	9	12

agri10	agriculture 10						
	graduate	male	na	0	0	0	0	0
	dropout	male	na	3	5	6	9	10
agri11	agriculture 11						
	graduate	male	na	0	0	0	0	0
	dropout	male	na	9	11	19	26	36
agri12	agriculture 12						
	graduate	male	na	65	73	88	152	211
	dropout	male	na	4	4	5	8	12
comm10	commercial 10						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	5	4	6	8	9
		female	na	1	0	0	0	0
		total	na	6	5	6	8	9
comm11	commercial 11						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	5	5	4	6	8
		female	na	1	1	0	0	0
		total	na	5	6	4	6	8
comm12	commercial 12						
	graduate	male	na	129	199	219	199	251
		female	na	44	43	63	6	0
		total	na	172	242	282	205	251
	dropout	male	na	7	11	12	11	14
		female	na	1	1	1	0	0
		total	na	8	12	13	11	14
intec10	industrial/technica..						
	graduate	male	na	0	0	0	0	0
	dropout	male	na	19	24	31	43	51
intec11	industrial/technica..						
	graduate	male	na	0	0	0	0	0
	dropout	male	na	5	6	8	11	14

intec12	industrial/technica..						
	graduate male	na	143	230	288	373	487
	dropout male	na	3	5	6	8	10
sptt13	senior prim teachin..						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	0	0	3	5	8
	female	na	0	0	0	1	1
	total	na	0	0	3	6	10
sptt14	senior prim teachin..						
	graduate male	na	0	0	0	37	80
	female	na	0	0	0	6	14
	total	na	0	0	0	42	94
	dropout male	na	0	0	0	2	5
	female	na	0	0	0	0	1
	total	na	0	0	0	2	6
ptech13	polytech yr 1						
	graduate male	na	0	0	0	0	0
	dropout male	na	0	0	3	7	11
ptech14	polytech yr 2						
	graduate male	na	0	0	0	19	50
	dropout male	na	0	0	0	1	3
med13	medicine yr 1						
	graduate male	na	0	0	0	0	0
	female	na	0	0	0	0	0
	total	na	0	0	0	0	0
	dropout male	na	25	24	24	29	32
	female	na	4	4	4	3	3
	total	na	29	27	27	32	35

med14	medicine yr 2						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	5	6	6	6	7
		female	na	1	3	3	3	3
		total	na	6	9	9	9	10
med15	medicine yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	0	4	6	6	6
		female	na	1	1	3	3	3
		total	na	1	5	9	9	9
med16	medicine yr 4							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	0	0	4	6	5
		female	na	0	1	1	3	3
		total	na	1	1	5	9	9
med17	medicine yr 5							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	0	0	0	4	5
		female	na	0	0	1	1	3
		total	na	0	1	1	5	8
med18	medicine yr 6							
	graduate	male	na	0	0	12	12	117
		female	na	0	0	4	14	16
		total	na	0	0	16	26	133
	dropout	male	na	0	0	0	0	4
		female	na	0	0	0	1	1
		total	na	0	0	1	1	5

eng13	engineering yr 1						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	26	32	33	41	45
		female	na	4	4	4	4	4
		total	na	30	36	37	45	48
eng14	engineering yr 2							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	4	4	5	5	6
		female	na	0	1	1	1	1
		total	na	4	4	5	5	6
eng15	engineering yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	4	4	3	4	4
		female	na	0	0	1	1	1
		total	na	4	4	4	5	5
eng16	engineering yr 4							
	graduate	male	na	98	94	90	80	100
		female	na	0	0	4	12	13
		total	na	98	94	95	92	113
	dropout	male	na	4	4	4	3	4
		female	na	0	0	0	0	1
		total	na	4	4	4	4	5
sci13	science yr 1							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	40	36	35	43	47
		female	na	24	27	27	25	24
		total	na	64	63	62	69	72

sci14	science yr 2						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	2	4	4	4	5
		female	na	1	1	2	2	2
		total	na	3	6	6	5	6
sci15	science yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	1	1	4	4	4
		female	na	1	1	1	2	1
		total	na	3	3	5	5	5
sci16	science yr 4							
	graduate	male	na	32	32	33	85	82
		female	na	12	14	12	14	16
		total	na	44	45	45	99	98
	dropout	male	na	1	1	1	4	4
		female	na	1	1	1	1	1
		total	na	2	3	2	5	5
agri13	agriculture yr 1							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	27	32	33	40	44
		female	na	1	1	1	1	1
		total	na	28	33	34	41	45
agri14	agriculture yr 2							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	1	5	6	6	7
		female	na	0	0	0	0	0
		total	na	1	5	6	6	7

agri15	agriculture yr 3						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	1	1	5	5	5
		female	na	0	0	0	0	0
		total	na	1	1	5	6	6
agri16	agriculture yr 4							
	graduate	male	na	20	23	21	82	97
		female	na	0	0	1	2	3
		total	na	20	23	22	84	100
	dropout	male	na	1	1	1	4	5
		female	na	0	0	0	0	0
		total	na	1	1	1	4	5
lib13	liberal arts yr 1							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	59	50	42	33	32
		female	na	21	16	15	17	15
		total	na	79	67	57	50	48
lib14	liberal arts yr 2							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	13	24	21	18	14
		female	na	5	8	7	6	7
		total	na	18	33	28	24	21
lib15	liberal arts yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	11	13	22	20	17
		female	na	3	5	8	7	6
		total	na	13	17	30	27	23

lib16	liberal arts yr 4						
	graduate	male	na	86	175	212	374	349
		female	na	29	48	79	131	113
		total	na	114	223	291	505	462
	dropout	male	na	5	10	12	21	19
		female	na	2	3	4	7	6
		total	na	6	12	16	28	26
busec13	business/econ yr 1							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	83	69	63	64	64
		female	na	10	8	8	8	8
		total	na	93	77	71	72	72
busec14	business/econ yr 2							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	32	76	66	60	60
		female	na	4	9	8	7	8
		total	na	35	85	74	68	68
busec15	business/econ yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	25	30	70	63	58
		female	na	3	3	8	7	7
		total	na	28	33	78	71	65
busec16	business/econ yr 4							
	graduate	male	na	278	414	504	1163	1082
		female	na	40	50	58	136	125
		total	na	318	464	562	1299	1207
	dropout	male	na	15	23	28	65	60
		female	na	2	3	3	8	7
		total	na	18	26	31	72	67

lawsh13	law and sharie yr 1						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	414	377	339	284	287
		female	na	11	12	12	13	13
		total	na	425	389	351	297	300
lawsh14	law and sharie yr 2						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	60	57	52	47	39
		female	na	1	2	2	2	2
		total	na	62	58	54	48	41
lawsh15	law and sharie yr 3						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	50	57	54	49	44
		female	na	1	1	1	2	2
		total	na	51	58	55	51	46
lawsh16	law and sharie yr 4						
	graduate	male	na	569	845	964	923	846
		female	na	15	15	23	24	27
		total	na	584	859	987	947	873
	dropout	male	na	32	47	54	51	47
		female	na	1	1	1	1	2
		total	na	32	48	55	53	48
edu13	education yr 1						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	136	120	110	100	103
		female	na	44	27	24	32	32
		total	na	180	147	134	133	136

edu14	education yr 2						
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	13	35	32	29	27
		female	na	5	11	7	6	8
		total	na	18	46	39	36	35
edu15	education yr 3							
	graduate	male	na	0	0	0	0	0
		female	na	0	0	0	0	0
		total	na	0	0	0	0	0
	dropout	male	na	11	13	32	30	28
		female	na	2	4	10	7	6
		total	na	14	17	42	37	34
edu16	education yr 4							
	graduate	male	na	98	187	212	525	515
		female	na	21	40	74	172	122
		total	na	119	227	286	697	637
	dropout	male	na	5	10	12	29	29
		female	na	1	2	4	10	7
		total	na	7	13	16	39	35

End of Report Generation Report

Manpower Allocation Model
M A M
Selected Reports

Simulation Yar16a

Edited data file: yar16a.med dated Tue Nov 01 18:36:04 1988
produced from:
manpower requirements data file: yar16a.dmr dated Tue Nov 01 18:34:38 1988
education simulation data file: yar16a.des dated Tue Nov 01 18:34:02 1988
manpower allocation data file: yar16a.dma dated Tue Nov 01 18:34:34 1988

Manpower Requirements Data Description:
Manpower Requirements Data for the YAR Test Dataset

Education Simulation Data Description:
Education Projection is based on yar3 with updating and changes.
Changes included enrollment in the University faculties by year.
It also includes fine tuning of the flow of students into the university
faculties taking into consideration each faculty present capacity.
Sources:
Educational Statistical Yearbook, MOE, 1987
Education in 25 years of the revolution, MOE, 1988
Statistical Year Book 1986, CPO
Assumptions:
constant efficiency rates
constant disposition rates

Manpower Allocation Data Description:
Manpower Allocation Data for YAR Test Dataset

Results file: yar16a.mer dated Tue Nov 01 18:37:36 1988
containing:
Manpower Requirements Simulation results
Education Simulation results
Manpower Allocation Simulation results
produced from:
edited data file: yar16a.med dated Tue Nov 01 18:36:04 1988

with parameters:

Base year of simulation: 1986

Number of years of simulation: 6

Simulate with missing data not selected.

School leaver results not saved by age.

Loading printer parameters from file printpar.mem

-- printer parameters for the Manpower and Education Model

page width 136	-- columns on a page
page length 66	-- lines on a page
form feed yes	-- use form feed character ^L to cause top of page

-- specify "form feed no" if form feed character ^L is not to be used

-- and instead pagination of output is to be handled by counting lines

Reports Produced:

LFY	for 1986 1987 1988 1989 1990 1991
NLASO	for 1986 1987 1988 1989 1990 1991
LFSON	for 1986 1987 1988 1989 1990 1991

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
Labor Force Highlights by Year for 1986-1991
(LFY)

	Year					
	1986	1987	1988	1989	1990	1991
Workers						
Total labor force	1606200	1656832	1710263	1766742	1826550	1890012
Nationals	1574650	1622268	1672048	1724428	1780017	1838609
Total expatriates	31550	34564	38216	42314	46533	51403
non Yemenis	31550	34564	38216	42314	46533	51403
From rest of world	0	0	0	0	0	0
Net change in labor force						
Total	-1	50632	53431	56478	59808	63462
Nationals	10449	47618	49780	52380	55589	58592
Total expatriates	-10450	3014	3652	4098	4219	4870
non Yemenis	-10450	3014	3652	4098	4219	4870
From rest of world	0	0	0	0	0	0
% of nationals in labor force						
Total	98.0%	97.9%	97.8%	97.6%	97.5%	97.3%
agriculture and fishing	100.0%	100.0%	100.0%	100.0%	99.9%	99.9%
mining and quarrying	99.9%	98.8%	98.1%	97.6%	97.3%	97.0%
manufacturing	99.8%	99.2%	98.7%	98.2%	97.8%	97.5%
utilities-electric ity and water	99.3%	97.7%	96.1%	94.8%	93.5%	92.4%
construction	99.9%	99.9%	99.8%	99.7%	99.6%	99.5%
trades & hotels	99.2%	99.7%	99.7%	99.6%	99.5%	99.5%
transportation and communication	99.9%	99.6%	99.4%	99.1%	98.9%	98.8%
banking,finance, business services	98.9%	98.8%	98.4%	98.0%	97.7%	97.5%
private and public services	88.4%	88.5%	88.6%	88.7%	88.8%	88.7%
university science/ math based professionals	76.0%	71.4%	67.1%	63.0%	59.7%	56.7%

university non-science/						
math based professional	74.3%	78.0%	85.7%	94.3%	100.0%	100.0%
science/math based technician						
with post-secondary	90.3%	86.2%	82.7%	80.0%	78.1%	77.3%
non-science/math based sub-professional						
with post-secondary	35.6%	39.6%	43.6%	47.0%	50.7%	54.4%
skilled and semi-skilled office	98.0%	99.5%	100.0%	100.0%	100.0%	100.0%
skilled and semi-skilled manual	98.0%	91.7%	86.0%	80.9%	76.2%	71.8%
semi-skilled requiring functional						
literacy plus OJT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
unskilled requiring no special						
education or training	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% of GDP attributable to nationals						
Total	98.1%	98.0%	97.8%	97.6%	97.4%	97.2%
agriculture and fishing	30.3%	29.3%	28.1%	26.9%	25.5%	23.9%
mining and quarrying	1.4%	2.1%	3.1%	4.6%	6.8%	9.8%
manufacturing	13.1%	13.3%	13.4%	13.5%	13.5%	13.4%
utilities-electricity and water	0.6%	0.7%	0.7%	0.7%	0.8%	0.8%
construction	3.6%	3.6%	3.5%	3.4%	3.3%	3.2%
trades & hotels	13.8%	13.7%	13.5%	13.3%	12.9%	12.4%
transportation and communication	11.6%	11.7%	11.6%	11.6%	11.4%	11.1%
banking,finance, business services	11.7%	11.7%	11.5%	11.4%	11.1%	10.7%
private and public services	11.9%	12.1%	12.2%	12.2%	12.2%	12.0%
surplus nationals						
Total	90346	86512	103592	141452	205082	289048
professional and technical occupations (A-1)	0	0	0	0	0	0
other professional occupation (A-2)	0	0	0	0	1510	3577
science technician (B-1)	0	0	0	0	0	0
non-science sub-professional (B-2)	0	0	0	0	0	0
skilled/intermediate-skilled office occupation (C)	0	0	4052	11983	25387	44169
skilled/intermediate-skilled manual occupation (D)	0	0	0	0	0	0
semi-skilled:primary/						
literacy plus job training (E)	48073	67540	93107	125012	162691	199724
unskilled occupation (F)	42273	18972	6433	4457	15494	41579

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1986

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing								
Manpower required	653	373	3641	373	2801	1867	3734	920058
Remaining nationals	650	371	3623	371	2745	1830	3622	892456
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	4	2	18	2	56	37	112	27601
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	112	27601
Computed total	650	371	3623	371	2745	1830	3734	920058
Additional nationals required	4	2	18	2	56	37	0	0
mining and quarrying								
Manpower required	64	64	64	0	96	192	358	5562
Remaining nationals	64	64	64	0	94	188	347	5395
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	0	0	0	0	2	4	11	166
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	11	166
Computed total	64	64	64	0	94	188	358	5562
Additional nationals required	0	0	0	0	2	4	0	0

manufacturing								
Manpower required	231	289	462	347	1734	3468	6936	44333
Remaining nationals	230	288	460	345	1699	3399	6728	43003
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	1	1	3	2	35	69	208	1330
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	208	1330
Computed total	230	288	460	345	1699	3399	6936	44333
Additional nationals required	1	1	3	2	35	69	0	0
utilities-electricity and water								
Manpower required	1542	514	2364	1028	3084	12850	8738	21280
Remaining nationals	1534	511	2352	1023	3022	12593	8475	20642
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	8	3	12	5	62	257	262	638
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	262	638
Computed total	1534	511	2352	1023	3022	12593	8738	21280
Additional nationals required	8	3	12	5	62	257	0	0
construction								
Manpower required	111	111	111	0	775	2214	30996	76383
Remaining nationals	110	110	110	0	760	2170	23276	67302
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	0	0	0	0	15	44	7720	9081
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	7720	9081
Computed total	110	110	110	0	760	2170	30996	76383
Additional nationals required	0	0	0	0	15	44	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
National Labor Allocation by Sector and Occupation for 1986
(NLASO)

Sector		Occupation total
agriculture and fishing	Manpower required	933500
	Remaining nationals	905668
	Nationalization target rate	
	New nationals to meet target	27832
	Labor source pool	
	Allocation priority	
	Allocated national workers	27713
	Computed total	933381
	Additional nationals required	119
mining and quarrying	Manpower required	6400
	Remaining nationals	6216
	Nationalization target rate	
	New nationals to meet target	184
	Labor source pool	
	Allocation priority	
	Allocated national workers	178
	Computed total	6393
	Additional nationals required	7
manufacturing	Manpower required	57800
	Remaining nationals	56151
	Nationalization target rate	
	New nationals to meet target	1649
	Labor source pool	
	Allocation priority	
	Allocated national workers	1538
	Computed total	57689
	Additional nationals required	111

utilities-electricity and water	Manpower required	51400
	Remaining nationals	50154
	Nationalization target rate	
	New nationals to meet target	1246
	Labor source pool	
	Allocation priority	
	Allocated national workers	900
	Computed total	51054
	Additional nationals required	346
construction	Manpower required	110700
	Remaining nationals	93838
	Nationalization target rate	
	New nationals to meet target	16862
	Labor source pool	
	Allocation priority	
	Allocated national workers	16801
	Computed total	110640
	Additional nationals required	60

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1986

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	125	125	376	2506	46361	1253	26313	48241
Remaining nationals	124	124	374	2493	45434	1228	25524	46794
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	1	1	2	13	927	25	789	1447
Labor source pool	one	two	three	four	five	six	s even	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	789	1447
Computed total	124	124	374	2493	45434	1228	26313	48241
Additional nationals required	1	1	2	13	927	25	0	0
transportation and communication								
Manpower required	90	90	225	90	810	1890	1080	40725
Remaining nationals	90	90	224	90	794	1852	1048	39503
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	0	0	1	0	16	38	32	1222
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	32	1222
Computed total	90	90	224	90	794	1852	1080	40725
Additional nationals required	0	0	1	0	16	38	0	0

banking, finance, business services								
Manpower required	416	832	1040	1248	10608	62	874	5720
Remaining nationals	414	828	1035	1242	10396	61	848	5548
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	2	4	5	6	212	2	26	172
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	26	172
Computed total	414	828	1035	1242	10396	61	874	5720
Additional nationals required	2	4	5	6	212	2	0	0
private and public services								
Manpower required	9446	9446	13276	25530	51060	23998	10212	112332
Remaining nationals	6414	6414	11220	5502	50039	23518	9906	108962
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	3032	3032	2056	20028	1021	480	306	3370
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	0	0	0	0	0	306	3370
Computed total	6414	6414	11220	5502	50039	23518	10212	112332
Additional nationals required	3032	3032	2056	20028	1021	480	0	0
total								
Manpower required	12679	11845	21559	31122	117328	47795	89241	1274632
Remaining nationals	9630	8800	19461	11066	114982	46838	79774	1229605
New nationals to meet target	3049	3045	2097	20056	2346	956	9467	45027
Allocated national workers	0	0	0	0	0	0	9467	45027
Computed total	9630	8800	19461	11066	114982	46838	89241	1274632
Additional nationals required	3049	3045	2097	20056	2346	956	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1986
(NLASO)

Sector		Occupation total
trades & hotels	Manpower required	125300
	Remaining nationals	122095
	Nationalization target rate	
	New nationals to meet target	3205
	Labor source pool	
	Allocation priority	
	Allocated national workers	2236
	Computed total	124332
	Additional nationals required	968
transportation and communication	Manpower required	45000
	Remaining nationals	43689
	Nationalization target rate	
	New nationals to meet target	1311
	Labor source pool	
	Allocation priority	
	Allocated national workers	1254
	Computed total	44944
	Additional nationals required	56
banking, finance, business services	Manpower required	20800
	Remaining nationals	20371
	Nationalization target rate	
	New nationals to meet target	429
	Labor source pool	
	Allocation priority	
	Allocated national workers	197
	Computed total	20569
	Additional nationals required	231

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private and public services	Manpower required	255300
	Remaining nationals	221974
	Nationalization target rate	
	New nationals to meet target	33326
	Labor source pool	
	Allocation priority	
	Allocated national workers	3676
	Computed total	225650
	Additional nationals required	29650
total	Manpower required	1606200
	Remaining nationals	1520156
	New nationals to meet target	86044
	Allocated national workers	54494
	Computed total	1574650
	Additional nationals required	31550

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training (E)

eight unskilled occupation (F)

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1987

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing								
Manpower required	662	378	3687	378	2836	1891	3782	931818
Remaining nationals	646	369	3605	369	2690	1793	3622	892456
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	15	9	83	9	146	98	160	39363
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	3	6	1	139	11	160	39363
Computed total	647	372	3611	370	2829	1804	3782	931818
Additional nationals required	15	6	76	8	8	87	0	0
mining and quarrying								
Manpower required	80	80	80	0	120	240	448	6951
Remaining nationals	63	63	63	0	92	184	348	5395
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	17	17	17	0	28	56	100	1556
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	5	1	0	26	6	100	1556
Computed total	64	68	65	0	119	191	448	6951
Additional nationals required	16	12	15	0	1	49	0	0

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manufacturing								
Manpower required	251	313	502	376	1881	3761	7523	48082
Remaining nationals	229	286	457	344	1665	3331	6728	43003
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	22	27	44	33	215	431	795	5080
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	8	3	3	204	49	795	5080
Computed total	229	294	461	347	1869	3380	7523	48082
Additional nationals required	22	20	41	30	11	382	0	0
utilities-electricity and water								
Manpower required	1611	537	2470	1074	3221	13422	9127	22227
Remaining nationals	1527	509	2340	1018	2962	12341	8476	20641
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	84	28	129	56	259	1081	651	1585
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	8	10	5	246	123	651	1585
Computed total	1527	517	2350	1023	3208	12464	9127	22227
Additional nationals required	83	20	119	51	14	957	0	0
construction								
Manpower required	115	115	115	0	804	2297	32158	79245
Remaining nationals	110	110	110	0	744	2126	30066	74092
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	5	5	5	0	60	171	2091	5154
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	1	0	0	56	19	2091	5154
Computed total	110	111	110	0	801	2146	32158	79245
Additional nationals required	5	4	5	0	3	151	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
National Labor Allocation by Sector and Occupation for 1987
(NLASO)

Sector		Occupation total
agriculture and fishing	Manpower required	945433
	Remaining nationals	905551
	Nationalization target rate	
	New nationals to meet target	39882
	Labor source pool	
	Allocation priority	
	Allocated national workers	39682
	Computed total	945233
	Additional nationals required	200
mining and quarrying	Manpower required	7999
	Remaining nationals	6209
	Nationalization target rate	
	New nationals to meet target	1790
	Labor source pool	
	Allocation priority	
	Allocated national workers	1695
	Computed total	7904
	Additional nationals required	94
manufacturing	Manpower required	62689
	Remaining nationals	56042
	Nationalization target rate	
	New nationals to meet target	6646
	Labor source pool	
	Allocation priority	
	Allocated national workers	6142
	Computed total	62184
	Additional nationals required	504

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utilities-electricity and water	Manpower required	53688
	Remaining nationals	49814
	Nationalization target rate	
	New nationals to meet target	3874
	Labor source pool	
	Allocation priority	
	Allocated national workers	2630
	Computed total	52443
	Additional nationals required	1244
construction	Manpower required	114849
	Remaining nationals	107358
	Nationalization target rate	
	New nationals to meet target	7491
	Labor source pool	
	Allocation priority	
	Allocated national workers	7323
	Computed total	114681
	Additional nationals required	167

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Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1987

(NLASO)

	Occupation							
Sector	A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	130	130	390	2599	48090	1300	27294	50039
Remaining nationals	124	124	372	2481	44525	1203	25524	46793
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	6	6	18	118	3565	96	1771	3246
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	2	1	11	3377	11	1771	3246
Computed total	124	126	374	2492	47903	1214	27294	50039
Additional nationals required	6	4	16	107	187	85	0	0
transportation and communication								
Manpower required	95	95	236	95	851	1986	1135	42801
Remaining nationals	89	89	223	89	778	1815	1048	39503
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	5	5	14	5	73	171	87	3298
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	2	1	1	70	20	87	3298
Computed total	89	91	224	90	847	1835	1135	42801
Additional nationals required	5	4	13	5	4	152	0	0

banking, finance, business services								
Manpower required	439	877	1097	1316	11186	66	921	6031
Remaining nationals	412	824	1030	1236	10188	60	847	5548
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	27	54	67	80	998	6	74	483
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	15	5	8	945	1	74	483
Computed total	412	839	1035	1243	11133	60	921	6031
Additional nationals required	27	38	62	73	52	6	0	0

private and public services								
Manpower required	10100	10100	14195	27298	54595	25660	10919	120110
Remaining nationals	6382	6382	11164	5475	49038	23048	9906	108962
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	3718	3718	3031	21823	5557	2612	1013	11148
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	39	1049	235	2068	5265	298	1013	11148
Computed total	6421	7431	11398	7543	54303	23346	10919	120110
Additional nationals required	3679	2669	2797	19755	292	2314	0	0

total								
Manpower required	13481	12625	22771	33136	123584	50623	93306	1307305
Remaining nationals	9581	8756	19364	11011	112683	45901	86564	1236393
New nationals to meet target	3900	3870	3407	22125	10901	4721	6743	70912
Allocated national workers	41	1092	264	2096	10329	539	6743	70912
Computed total	9622	9847	19628	13108	123011	46440	93306	1307305
Additional nationals required	3859	2778	3143	20028	573	4183	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1987
(NLASO)

Sector		Occupation total
trades & hotels	Manpower required	129973
	Remaining nationals	121146
	Nationalization target rate	
	New nationals to meet target	8826
	Labor source pool	
	Allocation priority	
	Allocated national workers	8420
	Computed total	129566
	Additional nationals required	407
transportation and communication	Manpower required	47294
	Remaining nationals	43634
	Nationalization target rate	
	New nationals to meet target	3660
	Labor source pool	
	Allocation priority	
	Allocated national workers	3478
	Computed total	47112
	Additional nationals required	183
banking, finance, business services	Manpower required	21933
	Remaining nationals	20144
	Nationalization target rate	
	New nationals to meet target	1789
	Labor source pool	
	Allocation priority	
	Allocated national workers	1531
	Computed total	21675
	Additional nationals required	258

private and public services	Manpower required	272977
	Remaining nationals	220355
	Nationalization target rate	
	New nationals to meet target	52621
	Labor source pool	
	Allocation priority	
	Allocated national workers	21115
	Computed total	241470
	Additional nationals required	31507
total	Manpower required	1656832
	Remaining nationals	1530253
	New nationals to meet target	126579
	Allocated national workers	92015
	Computed total	1622268
	Additional nationals required	34564

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training(E)

eight unskilled occupation(F)

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1988

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing								
Manpower required	670	383	3734	383	2873	1915	3830	943730
Remaining nationals	643	370	3593	368	2772	1768	3668	903864
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	27	13	141	15	101	147	162	39866
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	6	12	2	101	11	162	39866
Computed total	644	376	3605	370	2873	1780	3830	943730
Additional nationals required	27	7	129	13	0	135	0	0
mining and quarrying								
Manpower required	100	100	100	0	150	300	560	8687
Remaining nationals	63	68	64	0	116	187	434	6742
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	37	32	36	0	34	113	125	1945
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	15	3	0	34	9	125	1945
Computed total	64	83	67	0	150	196	560	8687
Additional nationals required	36	17	33	0	0	104	0	0

manufacturing								
Manpower required	272	340	544	408	2040	4079	8159	52149
Remaining nationals	228	292	459	345	1832	3312	7297	46640
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	44	48	85	63	208	767	862	5509
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	23	7	7	208	60	862	5509
Computed total	228	315	466	351	2040	3372	8159	52149
Additional nationals required	44	25	78	56	0	708	0	0
utilities-electricity and water								
Manpower required	1682	561	2580	1122	3365	14019	9533	23216
Remaining nationals	1520	514	2339	1018	3143	12215	8853	21560
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	162	47	241	104	221	1804	680	1656
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	2	22	20	11	221	140	680	1656
Computed total	1521	536	2359	1029	3365	12355	9533	23216
Additional nationals required	161	25	221	93	0	1664	0	0
construction								
Manpower required	119	119	119	0	834	2383	33363	82215
Remaining nationals	109	111	110	0	785	2103	31193	76868
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	10	8	9	0	49	280	2170	5347
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	4	1	0	49	22	2170	5347
Computed total	109	115	111	0	834	2125	33363	82215
Additional nationals required	10	4	9	0	0	258	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
National Labor Allocation by Sector and Occupation for 1988
(NLASO)

Sector		Occupation total
agriculture and fishing	Manpower required	957518
	Remaining nationals	917047
	Nationalization target rate	
	New nationals to meet target	40471
	Labor source pool	
	Allocation priority	
	Allocated national workers	40159
	Computed total	957206
	Additional nationals required	312
mining and quarrying	Manpower required	9997
	Remaining nationals	7675
	Nationalization target rate	
	New nationals to meet target	2322
	Labor source pool	
	Allocation priority	
	Allocated national workers	2131
	Computed total	9807
	Additional nationals required	190
manufacturing	Manpower required	67991
	Remaining nationals	60404
	Nationalization target rate	
	New nationals to meet target	7586
	Labor source pool	
	Allocation priority	
	Allocated national workers	6675
	Computed total	67079
	Additional nationals required	911

utilities-electricity and water	Manpower required	56077
	Remaining nationals	51162
	Nationalization target rate	
	New nationals to meet target	4915
	Labor source pool	
	Allocation priority	
	Allocated national workers	2752
	Computed total	53914
	Additional nationals required	2163
construction	Manpower required	119153
	Remaining nationals	111278
	Nationalization target rate	
	New nationals to meet target	7874
	Labor source pool	
	Allocation priority	
	Allocated national workers	7593
	Computed total	118871
	Additional nationals required	281

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1988

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	135	135	404	2696	49883	1348	28312	51906
Remaining nationals	123	125	372	2480	46945	1190	26475	48538
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	12	10	33	217	2939	158	1837	3367
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	5	3	23	2939	12	1837	3367
Computed total	123	130	375	2502	49883	1202	28312	51906
Additional nationals required	12	5	30	194	0	146	0	0
transportation and communication								
Manpower required	99	99	249	99	895	2088	1193	44983
Remaining nationals	89	90	223	89	830	1798	1101	41517
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	11	9	26	10	64	290	92	3466
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	4	2	1	64	23	92	3466
Computed total	89	95	225	90	895	1820	1193	44983
Additional nationals required	11	5	24	9	0	267	0	0

banking, finance, business services								
Manpower required	463	925	1156	1388	11795	69	971	6360
Remaining nationals	410	835	1030	1237	10911	59	894	5851
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	52	90	127	151	884	10	78	509
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	43	11	16	884	1	78	509
Computed total	411	877	1040	1253	11795	60	971	6360
Additional nationals required	52	48	116	135	0	10	0	0
private and public services								
Manpower required	10799	10799	15178	29188	58375	27436	11675	128426
Remaining nationals	6389	7394	11341	7505	53217	22879	10591	116506
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	4411	3406	3837	21683	5158	4558	1084	11919
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	41	1612	323	2266	5158	354	1084	11919
Computed total	6430	9006	11664	9771	58375	23233	11675	128426
Additional nationals required	4370	1794	3513	19416	0	4204	0	0
total								
Manpower required	14340	13462	24064	35284	130209	53638	97596	1341671
Remaining nationals	9574	9798	19529	13042	120551	45511	90507	1268086
New nationals to meet target	4766	3663	4534	22242	9658	8127	7089	73585
Allocated national workers	44	1734	382	2325	9658	631	7089	73585
Computed total	9619	11532	19911	15367	130209	46143	97596	1341671
Additional nationals required	4721	1929	4153	19917	0	7496	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1988
(NLASO)

Sector		Occupation total
trades & hotels	Manpower required	134819
	Remaining nationals	126248
	Nationalization target rate	
	New nationals to meet target	8572
	Labor source pool	
	Allocation priority	
	Allocated national workers	8185
	Computed total	134433
	Additional nationals required	387
transportation and communication	Manpower required	49705
	Remaining nationals	45737
	Nationalization target rate	
	New nationals to meet target	3968
	Labor source pool	
	Allocation priority	
	Allocated national workers	3652
	Computed total	49390
	Additional nationals required	315
banking, finance, business services	Manpower required	23127
	Remaining nationals	21225
	Nationalization target rate	
	New nationals to meet target	1902
	Labor source pool	
	Allocation priority	
	Allocated national workers	1542
	Computed total	22767
	Additional nationals required	360

private and public services	Manpower required	291877
	Remaining nationals	235822
	Nationalization target rate	
	New nationals to meet target	56055
	Labor source pool	
	Allocation priority	
	Allocated national workers	22758
	Computed total	258580
	Additional nationals required	33297
total	Manpower required	1710263
	Remaining nationals	1576600
	New nationals to meet target	133664
	Allocated national workers	95448
	Computed total	1672048
	Additional nationals required	38216

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training (E)

eight unskilled occupation (F)

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
National Labor Allocation by Sector and Occupation for 1989
(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing								
Manpower required	679	388	3782	388	2909	1940	3879	955793
Remaining nationals	640	374	3587	368	2815	1744	3715	915418
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	38	14	195	20	94	196	164	40375
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	10	19	2	94	13	164	40375
Computed total	641	384	3606	370	2909	1757	3879	955793
Additional nationals required	38	4	177	18	0	182	0	0
mining and quarrying								
Manpower required	125	125	125	0	187	375	700	10857
Remaining nationals	63	83	67	0	147	192	543	8427
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	62	42	58	0	40	183	157	2431
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	30	6	0	40	12	157	2431
Computed total	64	113	73	0	187	204	700	10857
Additional nationals required	61	12	52	0	0	171	0	0

manufacturing								
Manpower required	295	369	590	442	2212	4424	8849	56559
Remaining nationals	227	313	463	350	1999	3304	7914	50584
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	68	55	127	93	213	1120	935	5975
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	40	12	10	213	75	935	5975
Computed total	228	353	475	360	2212	3380	8849	56559
Additional nationals required	67	16	114	83	0	1045	0	0
utilities-electricity and water								
Manpower required	1757	586	2694	1171	3514	14643	9957	24249
Remaining nationals	1514	534	2347	1024	3297	12108	9247	22519
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	243	52	347	148	217	2535	710	1730
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	2	37	33	16	217	170	710	1730
Computed total	1516	571	2380	1039	3514	12278	9957	24249
Additional nationals required	241	15	314	132	0	2365	0	0
construction								
Manpower required	124	124	124	0	865	2472	34613	85296
Remaining nationals	109	114	110	0	817	2082	32362	79749
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	15	9	14	0	48	390	2251	5548
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	7	1	0	48	26	2251	5548
Computed total	109	121	111	0	865	2108	34613	85296
Additional nationals required	15	3	12	0	0	364	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)
National Labor Allocation by Sector and Occupation for 1989
(NLASO)

Sector		Occupation total
agriculture and fishing	Manpower required	969757
	Remaining nationals	928661
	Nationalization target rate	
	New nationals to meet target	41096
	Labor source pool	
	Allocation priority	
	Allocated national workers	40677
	Computed total	969339
	Additional nationals required	419
mining and quarrying	Manpower required	12494
	Remaining nationals	9521
	Nationalization target rate	
	New nationals to meet target	2973
	Labor source pool	
	Allocation priority	
	Allocated national workers	2677
	Computed total	12198
	Additional nationals required	296
manufacturing	Manpower required	73741
	Remaining nationals	65155
	Nationalization target rate	
	New nationals to meet target	8586
	Labor source pool	
	Allocation priority	
	Allocated national workers	7261
	Computed total	72416
	Additional nationals required	1325

utilities-electricity and water	Manpower required	58573
	Remaining nationals	52590
	Nationalization target rate	
	New nationals to meet target	5983
	Labor source pool	
	Allocation priority	
	Allocated national workers	2916
	Computed total	55506
	Additional nationals required	3067
construction	Manpower required	123618
	Remaining nationals	115343
	Nationalization target rate	
	New nationals to meet target	8275
	Labor source pool	
	Allocation priority	
	Allocated national workers	7881
	Computed total	123224
	Additional nationals required	394

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1989

(NLASO)

	Occupation							
Sector	A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	140	140	420	2797	51743	1398	29368	53841
Remaining nationals	123	129	373	2490	48886	1178	27463	50348
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	17	11	47	307	2858	220	1905	3493
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	8	4	33	2858	15	1905	3493
Computed total	123	137	377	2523	51743	1193	29368	53841
Additional nationals required	17	3	42	274	0	205	0	0
transportation and communication								
Manpower required	104	104	261	104	940	2194	1254	47276
Remaining nationals	88	94	224	90	877	1784	1157	43634
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	16	10	37	15	64	410	97	3643
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	7	4	2	64	28	97	3643
Computed total	88	102	227	91	940	1812	1254	47276
Additional nationals required	16	3	34	13	0	382	0	0

banking, finance, business services								
Manpower required	488	975	1219	1463	12437	73	1024	6706
Remaining nationals	409	873	1035	1246	11559	59	942	6169
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	79	102	184	217	878	15	82	537
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	74	18	23	878	1	82	537
Computed total	409	947	1053	1270	12437	60	1024	6706
Additional nationals required	79	29	167	194	0	14	0	0
private and public services								
Manpower required	11547	11547	16228	31209	62417	29336	12483	137318
Remaining nationals	6398	8961	11606	9722	57208	22768	11325	124573
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	5150	2586	4623	21486	5209	6568	1159	12745
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	41	1857	442	2290	5209	441	1159	12745
Computed total	6438	10818	12048	12013	62417	23209	12483	137318
Additional nationals required	5109	729	4181	19196	0	6127	0	0
total								
Manpower required	15259	14358	25443	37575	137227	56856	102127	1377897
Remaining nationals	9571	11475	19812	15290	127605	45220	94668	1301421
New nationals to meet target	5688	2883	5632	22285	9622	11636	7459	76476
Allocated national workers	45	2071	538	2375	9622	781	7459	76476
Computed total	9616	13545	20350	17665	137227	46001	102127	1377897
Additional nationals required	5643	813	5094	19910	0	10855	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1989
(NLASO)

Sector		Occupation total
trades & hotels	Manpower required	139847
	Remaining nationals	130989
	Nationalization target rate	
	New nationals to meet target	8858
	Labor source pool	
	Allocation priority	
	Allocated national workers	8316
	Computed total	139305
	Additional nationals required	542
transportation and communication	Manpower required	52239
	Remaining nationals	47948
	Nationalization target rate	
	New nationals to meet target	4291
	Labor source pool	
	Allocation priority	
	Allocated national workers	3843
	Computed total	51791
	Additional nationals required	448
banking, finance, business services	Manpower required	24386
	Remaining nationals	22292
	Nationalization target rate	
	New nationals to meet target	2094
	Labor source pool	
	Allocation priority	
	Allocated national workers	1613
	Computed total	23905
	Additional nationals required	481

private and public services	Manpower required	312086
	Remaining nationals	252561
	Nationalization target rate	
	New nationals to meet target	59525
	Labor source pool	
	Allocation priority	
	Allocated national workers	24184
	Computed total	276745
	Additional nationals required	35341
total	Manpower required	1766742
	Remaining nationals	1625061
	New nationals to meet target	141681
	Allocated national workers	99367
	Computed total	1724428
	Additional nationals required	42314

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training (E)

eight unskilled occupation (F)

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Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1990

(NLASO)

Sector		Occupation A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing									
	Manpower required	688	393	3830	393	2946	1964	3929	968011
	Remaining nationals	638	382	3588	368	2851	1722	3763	927119
	Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	New nationals to meet target	50	11	243	25	95	242	166	40891
	Labor source pool	one	two	three	four	five	six	seven	eight
	Allocation priority	1	1	1	1	1	1	1	1
	Allocated national workers	1	11	28	3	95	14	166	40891
	Computed total	639	393	3615	371	2946	1735	3929	968011
	Additional nationals required	49	0	215	22	0	229	0	0
mining and quarrying									
	Manpower required	156	156	156	0	234	468	874	13570
	Remaining nationals	63	112	72	0	184	200	679	10532
	Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	New nationals to meet target	93	44	84	0	51	268	196	3038
	Labor source pool	one	two	three	four	five	six	seven	eight
	Allocation priority	1	1	1	1	1	1	1	1
	Allocated national workers	2	44	10	0	51	15	196	3038
	Computed total	65	156	82	0	234	215	874	13570
	Additional nationals required	91	0	74	0	0	253	0	0

manufacturing								
Manpower required	320	400	640	480	2399	4799	9597	61343
Remaining nationals	226	351	473	358	2168	3312	8583	54863
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	93	49	167	122	231	1487	1014	6480
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	2	49	19	15	231	83	1014	6480
Computed total	228	400	492	373	2399	3395	9597	61343
Additional nationals required	92	0	148	107	0	1404	0	0
utilities-electricity and water								
Manpower required	1835	612	2814	1224	3671	15295	10400	25328
Remaining nationals	1508	568	2368	1034	3444	12033	9659	23522
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	327	44	446	189	227	3262	742	1807
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	7	44	51	23	227	182	742	1807
Computed total	1515	612	2420	1057	3671	12215	10400	25328
Additional nationals required	321	0	395	167	0	3080	0	0
construction								
Manpower required	128	128	128	0	898	2565	35910	88493
Remaining nationals	109	120	111	0	848	2066	33575	82737
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	20	8	18	0	50	499	2336	5755
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	8	2	0	50	28	2336	5755
Computed total	109	128	113	0	898	2094	35910	88493
Additional nationals required	19	0	16	0	0	471	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1990

(NLASO)

Sector		Occupation total
agriculture and fishing	Manpower required	982154
	Remaining nationals	940430
	Nationalization target rate	
	New nationals to meet target	41723
	Labor source pool	
	Allocation priority	
	Allocated national workers	41209
	Computed total	981639
	Additional nationals required	514
mining and quarrying	Manpower required	15615
	Remaining nationals	11842
	Nationalization target rate	
	New nationals to meet target	3773
	Labor source pool	
	Allocation priority	
	Allocated national workers	3355
	Computed total	15197
	Additional nationals required	419
manufacturing	Manpower required	79978
	Remaining nationals	70335
	Nationalization target rate	
	New nationals to meet target	9643
	Labor source pool	
	Allocation priority	
	Allocated national workers	7893
	Computed total	78228
	Additional nationals required	1750

utilities-electricity and water	Manpower required	61179
	Remaining nationals	54136
	Nationalization target rate	
	New nationals to meet target	7043
	Labor source pool	
	Allocation priority	
	Allocated national workers	3082
	Computed total	57218
	Additional nationals required	3961
construction	Manpower required	128250
	Remaining nationals	119566
	Nationalization target rate	
	New nationals to meet target	8685
	Labor source pool	
	Allocation priority	
	Allocated national workers	8179
	Computed total	127745
	Additional nationals required	506

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector Occupation for 1990

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	145	145	435	2901	53673	1451	30463	55849
Remaining nationals	122	136	375	2510	50709	1169	28487	52226
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	23	9	60	391	2964	281	1976	3623
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	9	7	47	2964	16	1976	3623
Computed total	123	145	382	2557	53673	1185	30463	55849
Additional nationals required	22	0	53	344	0	266	0	0
transportation and communication								
Manpower required	110	110	275	110	988	2306	1318	49687
Remaining nationals	88	101	226	91	921	1775	1216	45858
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	22	9	48	19	67	531	102	3828
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	9	6	2	67	30	102	3828
Computed total	88	110	232	93	988	1805	1318	49687
Additional nationals required	21	0	43	17	0	501	0	0

banking, finance, business services								
Manpower required	514	1029	1286	1543	13114	77	1080	7071
Remaining nationals	407	942	1047	1263	12188	58	994	6505
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	107	87	238	280	926	19	87	566
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	2	87	27	34	926	1	87	566
Computed total	409	1029	1075	1297	13114	59	1080	7071
Additional nationals required	105	0	211	246	0	18	0	0
private and public services								
Manpower required	12347	12347	17352	33369	66739	31367	13348	146826
Remaining nationals	6406	10764	11987	11953	61169	22745	12109	133198
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	5940	1583	5365	21417	5570	8622	1239	13627
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	120	1583	617	2590	5570	482	1239	13627
Computed total	6526	12347	12604	14542	66739	23227	13348	146826
Additional nationals required	5821	0	4748	18827	0	8140	0	0
total								
Manpower required	16243	15319	26916	40020	144663	60292	106920	1416177
Remaining nationals	9568	13477	20248	17577	134482	45081	99063	1336560
New nationals to meet target	6675	1842	6668	22443	10181	15211	7856	79617
Allocated national workers	134	1842	766	2714	10181	850	7856	79617
Computed total	9702	15319	21015	20291	144663	45931	106920	1416177
Additional nationals required	6541	0	5902	19729	0	14361	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1990
(NLASO)

Sector		Occupation total
trades & hotels	Manpower required	145062
	Remaining nationals	135734
	Nationalization target rate	
	New nationals to meet target	9328
	Labor source pool	
	Allocation priority	
	Allocated national workers	8643
	Co·nputed total	144377
	Additional nationals required	685
transportation and communication	Manpower required	54902
	Remaining nationals	50277
	Nationalization target rate	
	New nationals to meet target	4625
	Labor source pool	
	Allocation priority	
	Allocated national workers	4043
	Computed total	54321
	Additional nationals required	582
banking, finance, business services	Manpower required	25714
	Remaining nationals	23405
	Nationalization target rate	
	New nationals to meet target	2309
	Labor source pool	
	Allocation priority	
	Allocated national workers	1730
	Computed total	25135
	Additional nationals required	579

private and public services	Manpower required	333694
	Remaining nationals	270332
	Nationalization target rate	
	New nationals to meet target	63363
	Labor source pool	
	Allocation priority	
	Allocated national workers	25826
	Computed total	296158
	Additional nationals required	37537
total	Manpower required	1826550
	Remaining nationals	1676057
	New nationals to meet target	150493
	Allocated national workers	103960
	Computed total	1780017
	Additional nationals required	46533

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training (E)

eight unskilled occupation (F)

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1991

(NLASO)

	Occupation							
Sector	A-1	A-2	B-1	B-2	C	D	E	F
agriculture and fishing								
Manpower required	696	398	3879	398	2984	1989	3979	980384
Remaining nationals	635	391	3597	369	2888	1701	3811	938970
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	61	7	282	29	97	289	168	41414
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	7	41	4	97	14	168	41414
Computed total	637	398	3639	373	2984	1715	3979	980384
Additional nationals required	60	0	241	25	0	274	0	0
mining and quarrying								
Manpower required	195	195	195	0	293	585	1093	16959
Remaining nationals	65	155	81	0	230	211	848	13163
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	130	40	114	0	63	375	245	3797
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	3	40	17	0	63	19	245	3797
Computed total	67	195	98	0	293	229	1093	16959
Additional nationals required	128	0	97	0	0	356	0	0

manufacturing								
Manpower required	347	434	694	520	2602	5205	10409	66531
Remaining nationals	227	398	490	371	2351	3327	9309	59503
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	120	36	204	150	251	1877	1100	7029
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	2	36	30	20	251	93	1100	7029
Computed total	230	434	520	391	2602	3421	10409	66531
Additional nationals required	117	0	174	130	0	1784	0	0
utilities-electricity and water								
Manpower required	1917	639	2940	1278	3834	15976	10863	26456
Remaining nationals	1507	609	2408	1052	3597	11971	10088	24568
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	410	30	532	226	237	4005	775	1887
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	8	30	78	30	237	199	775	1887
Computed total	1515	639	2486	1082	3834	12170	10863	26456
Additional nationals required	402	0	454	196	0	3806	0	0
construction								
Manpower required	133	133	133	0	931	2661	37256	91809
Remaining nationals	108	128	112	0	880	2052	34833	85838
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	25	5	21	0	52	609	2423	5971
Labor source pool	one	two	three	five	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	0	5	3	0	52	30	2423	5971
Computed total	109	133	115	0	931	2082	37256	91809
Additional nationals required	24	0	18	0	0	579	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
National Labor Allocation by Sector and Occupation for 1991
(NLASO)

Sector	Occupation	total
agriculture and fishing	Manpower required	994708
	Remaining nationals	952362
	Nationalization target rate	
	New nationals to meet target	42346
	Labor source pool	
	Allocation priority	
	Allocated national workers	41747
	Computed total	994109
	Additional nationals required	599
mining and quarrying	Manpower required	19516
	Remaining nationals	14753
	Nationalization target rate	
	New nationals to meet target	4763
	Labor source pool	
	Allocation priority	
	Allocated national workers	4182
	Computed total	18935
	Additional nationals required	581
manufacturing	Manpower required	86742
	Remaining nationals	75976
	Nationalization target rate	
	New nationals to meet target	10766
	Labor source pool	
	Allocation priority	
	Allocated national workers	8561
	Computed total	84537
	Additional nationals required	2205

utilities-electricity and water	Manpower required	63902
	Remaining nationals	55800
	Nationalization target rate	
	New nationals to meet target	8102
	Labor source pool	
	Allocation priority	
	Allocated national workers	3245
	Computed total	59045
	Additional nationals required	4857
construction	Manpower required	133057
	Remaining nationals	123951
	Nationalization target rate	
	New nationals to meet target	9106
	Labor source pool	
	Allocation priority	
	Allocated national workers	8485
	Computed total	132436
	Additional nationals required	621

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

National Labor Allocation by Sector and Occupation for 1991

(NLASO)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F
trades & hotels								
Manpower required	150	150	451	3009	55675	1505	31599	57932
Remaining nationals	122	144	380	2545	52600	1161	29549	54173
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	28	6	71	465	3075	343	2050	3758
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	6	10	62	3075	17	2050	3758
Computed total	123	150	391	2607	55675	1178	31599	57932
Additional nationals required	28	0	61	403	0	326	0	0
transportation and communication								
Manpower required	115	115	289	115	1039	2423	1385	52220
Remaining nationals	88	109	231	93	968	1769	1278	48196
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	27	6	58	23	70	655	107	4024
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	1	6	9	3	70	33	107	4024
Computed total	89	115	239	96	1039	1801	1385	52220
Additional nationals required	27	0	49	20	0	622	0	0

banking, finance, business services								
Manpower required	542	1085	1356	1627	13828	81	1139	7457
Remaining nationals	407	1023	1069	1291	12852	58	1048	6859
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	135	61	286	336	976	23	91	597
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	3	61	42	45	976	1	91	597
Computed total	410	1085	1111	1336	13828	59	1139	7457
Additional nationals required	132	0	244	291	0	22	0	0

private and public services								
Manpower required	13202	13202	18554	35680	71360	33539	14272	156992
Remaining nationals	6493	12285	12541	14470	65404	22762	12947	142421
Nationalization target rate	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New nationals to meet target	6708	917	6013	21210	5956	10777	1325	14571
Labor source pool	one	two	three	four	five	six	seven	eight
Allocation priority	1	1	1	1	1	1	1	1
Allocated national workers	129	917	883	2846	5956	536	1325	14571
Computed total	6623	13202	13424	17315	71360	23298	14272	156992
Additional nationals required	6579	0	5130	18365	0	10241	0	0

total								
Manpower required	17298	16351	28490	42628	152546	63965	111995	1456739
Remaining nationals	9654	15242	20910	20189	141770	45013	103712	1373692
New nationals to meet target	7645	1108	7581	22439	10776	18952	8283	83047
Allocated national workers	147	1108	1113	3011	10776	942	8283	83047
Computed total	9801	16351	22022	23200	152546	45955	111995	1456739
Additional nationals required	7497	0	6468	19428	0	18010	0	0

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

National Labor Allocation by Sector and Occupation for 1991

(NLASO)

Sector	Occupation total	
trades & hotels		
	Manpower required	150472
	Remaining nationals	140675
	Nationalization target rate	
	New nationals to meet target	9797
	Labor source pool	
	Allocation priority	
	Allocated national workers	8980
	Computed total	149654
	Additional nationals required	818
transportation and communication		
	Manpower required	57701
	Remaining nationals	52732
	Nationalization target rate	
	New nationals to meet target	4969
	Labor source pool	
	Allocation priority	
	Allocated national workers	4251
	Computed total	56983
	Additional nationals required	718
banking,finance, business services		
	Manpower required	27115
	Remaining nationals	24608
	Nationalization target rate	
	New nationals to meet target	2507
	Labor source pool	
	Allocation priority	
	Allocated national workers	1817
	Computed total	26425
	Additional nationals required	690

private and public services	Manpower required	356799
	Remaining nationals	289323
	Nationalization target rate	
	New nationals to meet target	67476
	Labor source pool	
	Allocation priority	
	Allocated national workers	27161
	Computed total	316485
	Additional nationals required	40314
total	Manpower required	1890012
	Remaining nationals	1730181
	New nationals to meet target	159831
	Allocated national workers	108428
	Computed total	1838609
	Additional nationals required	51403

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

labor pool key

one professional and technical occupations (A-1)

two other professional occupation (A-2)

three science technician (B-1)

four non-science sub-professional (B-2)

five skilled/intermediate-skilled office occupation (C)

six skilled/intermediate-skilled manual occupation (D)

seven semi-skilled:primary/literacy plus job training (E)

eight unskilled occupation (F)

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov.1988)

Labor Force by Sector, Occupation, and Nationalilty for 1986

(LFSON)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing									
Nationals	650	371	3623	371	2745	1830	3734	920058	933381
non Yemenis	4	2	18	2	56	37	0	0	119
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	64	64	64	0	94	188	358	5562	6393
non Yemenis	0	0	0	0	2	4	0	0	7
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	230	288	460	345	1699	3399	6936	44333	57689
non Yemenis	1	1	3	2	35	69	0	0	111
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1534	511	2352	1023	3022	12593	8738	21280	51054
non Yemenis	8	3	12	5	62	257	0	0	346
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	110	110	110	0	760	2170	30996	76383	110640
non Yemenis	0	0	0	0	15	44	0	0	60
From rest of world	0	0	0	0	0	0	0	0	0

trades & hotels									
Nationals	124	124	374	2493	45434	1228	26313	48241	124332
non Yemenis	1	1	2	13	927	25	0	0	968
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	90	90	224	90	794	1852	1080	40725	44944
non Yemenis	0	0	1	0	16	38	0	0	56
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	414	828	1035	1242	10396	61	874	5720	20569
non Yemenis	2	4	5	6	212	2	0	0	231
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6414	6414	11220	5502	50039	23518	10212	112332	225650
non Yemenis	3032	3032	2056	20028	1021	480	0	0	29650
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9630	8800	19461	11066	114982	46838	89241	1274632	1574650
non Yemenis	3049	3045	2097	20056	2346	956	0	0	31550
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

Labor Force by Sector, Occupation, and Nationality for 1986

(LFSON)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing									
Nationals	647	372	3611	370	2829	1804	3782	931818	945233
non Yemenis	15	6	76	8	8	87	0	0	200
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	64	68	65	0	119	191	448	6951	7904
non Yemenis	16	12	15	0	1	49	0	0	94
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	229	294	461	347	1869	3380	7523	48082	62184
non Yemenis	22	20	41	30	11	382	0	0	504
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1527	517	2350	1023	3208	12464	9127	22227	52443
non Yemenis	83	20	119	51	14	957	0	0	1244
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	110	111	110	0	801	2146	32158	79245	114681
non Yemenis	5	4	5	0	3	151	0	0	167
From rest of world	0	0	0	0	0	0	0	0	0

trades & hotels									
Nationals	124	126	374	2492	47903	1214	27294	50039	129566
non Yemenis	6	4	16	107	187	85	0	0	407
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	89	91	224	90	847	1835	1135	42801	47112
non Yemenis	5	4	13	5	4	152	0	0	183
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	412	839	1035	1243	11133	60	921	6031	21675
non Yemenis	27	38	62	73	52	6	0	0	258
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6421	7431	11398	7543	54303	23346	10919	120110	241470
non Yemenis	3679	2669	2797	19755	292	2314	0	0	31507
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9622	9847	19628	13108	123011	46440	93306	1307305	1622268
non Yemenis	3859	2778	3143	20028	573	4183	0	0	34564
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

Labor Force by Sector, Occupation, and Nationality for 1986

(LFSON)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
Nationals	9630	8800	19461	11066	114982	46838	89241	1274632	1574650
agriculture and fishing									
Nationals	644	376	3605	370	2873	1780	3830	943730	957206
non Yemenis	27	7	129	13	0	135	0	0	312
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	64	83	67	0	150	196	560	8687	9807
non Yemenis	36	17	33	0	0	104	0	0	190
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	228	315	466	351	2040	3372	8159	52149	67079
non Yemenis	44	25	78	56	0	708	0	0	911
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1521	536	2359	1029	3365	12355	9533	23216	53914
non Yemenis	161	25	221	93	0	1664	0	0	2163
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	109	115	111	0	834	2125	33363	82215	118871
non Yemenis	10	4	9	0	0	258	0	0	281
From rest of world	0	0	0	0	0	0	0	0	0

trades & hotels									
Nationals	123	130	375	2502	49883	1202	28312	51906	134433
non Yemenis	12	5	30	194	0	146	0	0	387
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	89	95	225	90	895	1820	1193	44983	49390
non Yemenis	11	5	24	9	0	267	0	0	315
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	411	877	1040	1253	11795	60	971	6360	22767
non Yemenis	52	48	116	135	0	10	0	0	360
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6430	9006	11664	9771	58375	23233	11675	128426	258580
non Yemenis	4370	1794	3513	19416	0	4204	0	0	33297
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9619	11532	19911	15367	130209	46143	97596	1341671	1672048
non Yemenis	4721	1929	4153	19917	0	7496	0	0	38216
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

Labor Force by Sector, Occupation, and Nationality for 1986

(LFSON)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing									
Nationals	641	384	3606	370	2909	1757	3879	955793	969339
non Yemenis	38	4	177	18	0	182	0	0	419
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	64	113	73	0	187	204	700	10857	12198
non Yemenis	61	12	52	0	0	171	0	0	296
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	228	353	475	360	2212	3380	8849	56559	72416
non Yemenis	67	16	114	83	0	1045	0	0	1325
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1516	571	2380	1039	3514	12278	9957	24249	55506
non Yemenis	241	15	314	132	0	2365	0	0	3067
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	109	121	111	0	865	2108	34613	85296	123224
non Yemenis	15	3	12	0	0	364	0	0	394
From rest of world	0	0	0	0	0	0	0	0	0

trades & hotels									
Nationals	123	137	377	2523	51743	1193	29368	53841	139305
non Yemenis	17	3	42	274	0	205	0	0	542
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	88	102	227	91	940	1812	1254	47276	51791
non Yemenis	16	3	34	13	0	382	0	0	448
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	409	947	1053	1270	12437	60	1024	6706	23905
non Yemenis	79	29	167	194	0	14	0	0	481
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6438	10818	12048	12013	62417	23209	12483	137318	276745
non Yemenis	5109	729	4181	19196	0	6127	0	0	35341
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9616	13545	20350	17665	137227	46001	102127	1377897	1724428
non Yemenis	5643	813	5094	19910	0	10855	0	0	42314
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)
Labor Force by Sector, Occupation, and Nationality for 1986
(LFSON)

	Occupation								
Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing									
Nationals	639	393	3615	371	2946	1735	3929	968011	981639
non Yemenis	49	0	215	22	0	229	0	0	514
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	65	156	82	0	234	215	874	13570	15197
non Yemenis	91	0	74	0	0	253	0	0	419
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	228	400	492	373	2399	3395	9597	61343	78228
non Yemenis	92	0	148	107	0	1404	0	0	1750
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1515	612	2420	1057	3671	12215	10400	25328	57218
non Yemenis	321	0	395	167	0	3080	0	0	3961
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	109	128	113	0	898	2094	35910	88493	127745
non Yemenis	19	0	16	0	0	471	0	0	506
From rest of world	0	0	0	0	0	0	0	0	0

trades & hotels									
Nationals	123	145	382	2557	53673	1185	30463	55849	144377
non Yemenis	22	0	53	344	0	266	0	0	685
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	88	110	232	93	988	1805	1318	49687	54321
non Yemenis	21	0	43	17	0	501	0	0	582
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	409	1029	1075	1297	13114	59	1080	7071	25135
non Yemenis	105	0	211	246	0	18	0	0	579
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6526	12347	12604	14542	66739	23227	13348	146826	296158
non Yemenis	5821	0	4748	18827	0	8140	0	0	37537
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9702	15319	21015	20291	144663	45931	106920	1416177	1780017
non Yemenis	6541	0	5902	19729	0	14361	0	0	46533
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

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Central Planning Organization, Yemen Arab Republic, Sana'a (Nov. 1988)

Labor Force by Sector, Occupation, and Nationality for 1986

(LFSON)

Sector	Occupation A-1	A-2	B-1	B-2	C	D	E	F	total
agriculture and fishing									
Nationals	637	398	3639	373	2984	1715	3979	980384	994109
non Yemenis	60	0	241	25	0	274	0	0	599
From rest of world	0	0	0	0	0	0	0	0	0
mining and quarrying									
Nationals	67	195	98	0	293	229	1093	16959	18935
non Yemenis	128	0	97	0	0	356	0	0	581
From rest of world	0	0	0	0	0	0	0	0	0
manufacturing									
Nationals	230	434	520	391	2602	3421	10409	66531	84537
non Yemenis	117	0	174	130	0	1784	0	0	2205
From rest of world	0	0	0	0	0	0	0	0	0
utilities-electricity and water									
Nationals	1515	639	2486	1082	3834	12170	10863	26456	59045
non Yemenis	402	0	454	196	0	3806	0	0	4857
From rest of world	0	0	0	0	0	0	0	0	0
construction									
Nationals	109	133	115	0	931	2082	37256	91809	132436
non Yemenis	24	0	18	0	0	579	0	0	621
From rest of world	0	0	0	0	0	0	0	0	0

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trades & hotels									
Nationals	123	150	391	2607	55675	1178	31599	57932	149654
non Yemenis	28	0	61	403	0	326	0	0	818
From rest of world	0	0	0	0	0	0	0	0	0
transportation and communication									
Nationals	89	115	239	96	1039	1801	1385	52220	56983
non Yemenis	27	0	49	20	0	622	0	0	718
From rest of world	0	0	0	0	0	0	0	0	0
banking, finance, business services									
Nationals	410	1085	1111	1336	13828	59	1139	7457	26425
non Yemenis	132	0	244	291	0	22	0	0	690
From rest of world	0	0	0	0	0	0	0	0	0
private and public services									
Nationals	6623	13202	13424	17315	71360	23298	14272	156992	316485
non Yemenis	6579	0	5130	18365	0	10241	0	0	40314
From rest of world	0	0	0	0	0	0	0	0	0
total									
Nationals	9801	16351	22022	23200	152546	45955	111995	1456739	1838609
non Yemenis	7497	0	6468	19428	0	18010	0	0	51403
From rest of world	0	0	0	0	0	0	0	0	0

occupation key

A-1 university science/math based professionals

A-2 university non-science/math based professional

B-1 science/math based technician with post-secondary

B-2 non-science/math based sub-professional with post-secondary

C skilled and semi-skilled office

D skilled and semi-skilled manual

E semi-skilled requiring functional literacy plus OJT

F unskilled requiring no special education or training

End of Report Generation Report

Manpower Planning Project Training Workshop

Yemen Arab Republic

Volume 3

Manpower Education Model

Exercises
Reference
Summary

Albany, New York
January 1989

IEES

Improving the Efficiency of Educational Systems

The Florida State University
Howard University
Institute for International Research
State University of New York at Albany

United States Agency for International Development
Bureau for Science and Technology
Office of Education
Contract No. DPE-5823-C-00-4013-00

Improving the Efficiency of Educational Systems (IEES) is an initiative funded in 1984 by the Agency for International Development (AID), Bureau for Science and Technology, Office of Education. The principal goals of the IEES Project are to help developing countries improve the performance of their educational systems and strengthen their capabilities for educational planning, management, and research. To achieve these goals, a consortium of U.S. institutions has been formed to work collaboratively with selected host governments and USAID Missions for ten years. The Consortium consists of The Florida State University (prime contractor), Howard University, the Institute for International Research, and the State University of New York at Albany.

There are seven countries working with the IEES initiative to improve educational efficiency: Botswana, Haiti, Indonesia, Liberia, Nepal, Somalia, and Yemen Arab Republic.

Documents published by IEES are produced to promote improved educational practice, planning, and research within these countries. All publications generated by project activities are held in the IEES Educational Efficiency Clearinghouse at The Florida State University. Requests for project documents should be addressed to:

IEES
Educational Efficiency Clearinghouse
Learning Systems Institute
204 Dodd Hall
The Florida State University
Tallahassee, Florida 32306
USA
(904) 644-5442

Agency for International Development
Bureau for Science and Technology
Office of Education
Contract No. DPE-5823-C-00-4013-00
Project No. 936-5823

These materials were prepared for an IEES training workshop for educators from the Yemen Arab Republic (YAR) in January 1989. They consist of three volumes:

Volume 1: DOS/SPSS-PC+/ENABLE/LOTUS 1•2•3
Introduction to Statistics
Volume 2: Manpower Education Model
Volume 3: Manpower Education Model (Exercises, Reference, Summary)

An English/Arabic glossary of Labor Force and Manpower terms is provided in Volume 1.

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Gratitude is expressed to the World Bank, who made their Manpower and Education Model available for training purposes during this workshop.

Volume 3

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Exercises on the Effects of Changes in the Output and Productivity Growth Rates on the Manpower Requirements

Introduction

The purpose of these exercises is to show the effects of an increase in sectoral output growth rates on the manpower requirements.

Exercise 1

CHANGING THE SECTORAL OUTPUT GROWTH RATES

IN THE

MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to show the effects of the increase in sectoral output growth rates on the manpower requirements.

Steps:

1 - Copy yar16a.dmr and give it another name as follows:

copy yar16a.dmr exer1.dmr

2 - Look at the contents of the file; exer1.dmr by using the Norton Editor as follows:

ne exer1.dmr

3 - Use the down arrow to go to the sectoral output, you will see the following data item:

```
#OUT -- sectoral output
--              sector
--      year    code    output
        1986    agr     10680
        1986    m&q       506
        1986    mfg      4620
        1986    util      220
        1986    con      1285
        1986    trh      4896
        1986    t&c      4106
        1986    b&f      4166
        1986    ser      4746
        1987    agr        g3%
        1987    m&q     g59.6%
        1987    mfg        g9%
        1987    util      g15%
        1987    con      g5.2%
        1987    trh      g5.7%
        1987    t&c      g7.2%
        1987    b&f      g6.5%
        1987    ser      g8.1%
```

The upper part of the data item is the sectoral output and the lower part is the growth rate of that sectoral output.

4 - Increase the growth rates of each sector by 2 percent so the growth rates would look like the following:

```
#OUT -- sectoral output
--              sector
--      year    code    output
        1986    agr     10680
        1986    m&q       506
        1986    mfg      4620
        1986    util      220
        1986    con      1285
        1986    trh      4896
        1986    t&c      4106
        1986    b&f      4166
        1986    ser      4746
        1987    agr       g5%
        1987    m&q     g61.6%
        1987    mfg      g11%
        1987    util     g17%
        1987    con      g7.2%
        1987    trh      g7.7%
        1987    t&c      g9.2%
        1987    b&f      g8.5%
        1987    ser     g10.1%
```

5 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then press: **E**

6 - Make an edit to the file by giving the following command:

medit exer1 -des nofile -dma nofile

If the results of the edit has errors look at your errors in the file exer1.oe by using the Norton Editor by giving the following command:

ne exer1.oe

Correct the errors in the input data file exer1.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer1 1986 6 -yes mrm

If the results of the simulation have errors look at your errors in the file exer1.os by using the Norton Editor by giving the following command:

ne exer1.os

Correct the errors in the input data file exer1.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation produce table employment by sector and year (ESY) for the base year 1986 and the target year 1991 by giving the following command:

mreport exer1 esy 1986 1991

9 - Look at the ESY table using the Norton Editor by giving the following command:

ne exer1.or

10 - Compare the manpower requirements in ESY table that you just produced with ESY table before the changes in the base year 1986 and the target year 1991.

Exercise 2

DECREASING THE SECTORAL PRODUCTIVITY GROWTH RATES

IN THE

MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to show the effects of the decrease in sectoral productivity growth rates on the manpower requirements.

Steps:

1 - Copy yar16a.dmr and give it another name as follows:

copy yar16a.dmr exer2.dmr

2 - Look at the contents of the file; exer2.dmr by using the Norton Editor as follows:

ne exer2.dmr

3 - Use the down arrow to go to the sectoral labor productivity, you will see the following data item:

```
#PRD -- labor productivity
--              sector
--      year    code   productivity
        1986    agr      g1.7%
        1986    m&q     g27.7%
        1986    mfg      g0.5%
        1986    util    g10.1%
        1986    con      g1.4%
        1986    trh      g1.9%
        1986    t&c      g2.0%
        1986    b&f      g1.0%
        1986    ser      g1.1%
```

4 - Decrease the growth rates of each sector and make them zero; the growth rates would then look like the following:

```
#PRD -- labor productivity
--              sector
--      year    code   productivity
        1986    agr      g0%
        1986    m&q      g0%
        1986    mfg      g0%
        1986    util     g0%
        1986    con      g0%
        1986    trh      g0%
        1986    t&c      g0%
        1986    b&f      g0%
        1986    ser      g0%
```

5 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then press: **E**

6 - Make an edit to the file by giving the following command:

medit exer2 -des nofile -dma nofile

If the results of the edit has errors look at your errors in the file exer2.oe by using the Norton Editor by giving the following command:

ne exer2.oe

Correct the errors in the input data file exer2.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer2 1986 6 -yes mrm

If the results of the simulation have errors look at the errors in the file exer2.os by using the Norton Editor by giving the following command:

ne exer2.os

Correct the errors in the input data file exer2.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation, produce table employment by sector and year (ESY) for the base year 1986 and the target year 1991 by giving the following command:

mreport exer2 esy 1986 1991

9 - Look at the ESY table using the Norton Editor by giving the following command:

ne exer2.or

10 - Compare the manpower requirements in ESY table that you just produced with ESY table before the changes in the base year 1986 and the target year 1991.

Exercise 3

INCREASING THE SECTORAL PRODUCTIVITY GROWTH RATES

IN THE

MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to show the effects of the increase in sectoral productivity growth rates on the manpower requirements.

Steps:

1 - Copy yar16a.dmr and give it another name as follows:

copy yar16a.dmr exer3.dmr

2 - Look at the contents of the file; exer3.dmr by using the Norton Editor as follows:

ne exer3.dmr

3 - Use the down arrow to go to the sectoral labor productivity, you will see the following data item:

```
#PRD -- labor productivity
--              sector
--      year    code   productivity
        1986    agr      g1.7%
        1986    m&q     g27.7%
        1986    mfg      g0.5%
        1986    util    g10.1%
        1986    con      g1.4%
        1986    trh      g1.9%
        1986    t&c      g2.0%
        1986    b&f      g1.0%
        1986    ser      g1.1%
```

4 - Increase the growth rates of each sector by 2% so the growth rates would look like the following:

```
#PRD -- labor productivity
--              sector
--      year    code   productivity
        1986    agr      g3.7%
        1986    m&q     g29.7%
        1986    mfg      g2.5%
        1986    util    g12.1%
        1986    con      g3.4%
        1986    trh      g3.9%
        1986    t&c      g5.0%
        1986    b&f      g3.0%
        1986    ser      g3.1%
```

5 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then press: **E**

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6 - Make an edit to the file by giving the following command:

medit exer3 -des nofile -dma nofile

If the results of the edit has errors look at your errors in the file exer3.oe by using the Norton Editor by giving the following command:

ne exer3.oe

Correct the errors in the input data file exer3.dmr and exit with save by pushing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer3 1986 6 -yes mrm

If the results of the simulation have errors look at the errors in the file exer3.os by using the Norton Editor by giving the following command:

ne exer3.os

Correct the errors in the input data file exer3.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation produce table employment by sector and year (ESY) for the base year 1986 and the target year 1991 by giving the following command:

mreport exer3 esy 1986 1991

9 - Look at the ESY table using the Norton Editor by giving the following command:

ne exer3.or

10 - Compare the manpower requirements in ESY table that you just produced with ESY table before the changes in the base year 1986 and the target year 1991.

Results Comparison of Exercise 1, Exercise 2, and Exercise 3

The PSY tables produced in the three previous exercises and the original one without changes are shown below. After doing the exercises you should get the same results. Compare the manpower demand in each sector and the total in the four tables and explain the effects of the changes of output increase and productivity decrease and increase on the manpower demand.

Employment Summary by Sector and Year for 1986-1991
(ESY)

(Original Run YAR16A, No Changes)

	Year					
Sector	1986	1987	1988	1989	1990	1991
agriculture	933500	845433	957518	969757	982154	994708
mining and qu	6400	7999	9997	12494	15615	19516
manufacturing	57800	62689	67991	73741	79978	86742
utilities-ele	51400	53688	56077	58573	61179	63902
construction	110700	114849	119153	123618	128250	133057
trades & hotel	125300	129973	134819	139847	145062	150472
transportation	45000	47294	49705	52239	54902	57701
banking, finance	20800	21933	23127	24386	25714	27115
private and pub	255300	272977	291877	312086	333694	356799
total	1606200	1656832	1710263	1766742	1826550	1890012

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Employment Summary by Sector and Year for 1986-1991
(ESY)

(Exercise 1: Output Growth Rates Increased by 2%)

	Year					
Sector	1986	1987	1988	1989	1990	1991
agriculture	933500	963791	995064	1027352	1060688	1095106
mining and qu	6400	8099	10249	12970	16413	20770
manufacturing	57800	63839	70509	77875	86011	94998
utilities-ele	51400	54621	58044	61682	65548	69656
construction	110700	117032	123726	130803	138285	146195
trades & hotel	125300	132432	139970	147937	156357	165257
transportatio	45000	48176	51577	55218	59116	63289
banking, finance	20800	22345	24004	25786	27701	29758
private and pub	255300	278027	302777	329731	359084	391049
total	1606200	1688361	1775920	1869354	1969202	2076076

Employment Summary by Sector and Year for 1986-1991
(ESY)

(Exercise 2: Labor Productivity Growth Rates Assumed to be Zero)

Sector	Year 1986	1987	1988	1989	1990	1991
agriculture	933500	961505	990350	1020061	1050662	1082182
mining and qu	6400	10214	16302	26018	41525	66274
manufacturing	57800	63002	68672	74853	81589	88932
utilities-ele	51400	59110	67976	78173	89899	103384
construction	110700	116456	122512	128883	135585	142635
trades & hotel	125300	132442	139991	147971	156405	165320
transportation	45000	48240	51713	55437	59428	63707
banking, finance	20800	22152	23592	25125	26759	28498
private and pub	255300	275979	298334	322499	348621	376859
total	1606200	1689101	1779443	1879019	1990473	2117792

Employment Summary by Sector and Year for 1986-1991
(ESY)

(Exercise 3: Labor Productivity Growth Rates Increased by 2%)

	Year					
Sector	1986	1987	1988	1989	1990	1991
agriculture	933500	927199	920940	914723	908549	902416
mining and qu	6400	7875	9691	11925	14674	18057
manufacturing	57800	61465	65363	69508	73916	78603
utilities-ele	51400	52730	54094	55493	56929	58402
construction	110700	112627	114588	116582	118612	120677
trades & hotel	125300	127471	129679	131926	134211	136536
transportation	45000	45943	46905	47888	48892	49916
banking, finance	20800	21507	22238	22993	23775	24582
private and pub	255300	267681	280663	294274	308545	323509
total	1606200	1624498	1644160	1665313	1688102	1712698

Exercises on the Effects of Changes in the Efficiency Rates and Student Distribution Ratios on Enrollment in the Education Simulation Model

Introduction

These exercises are designed to show the effects of various changes in efficiency rates and student distribution ratios on enrollment in the Education Simulation Model.

Exercise 4

CHANGING THE EFFICIENCY RATES

IN THE

EDUCATION SIMULATION MODEL

(HIGHER PROMOTION RATE AND ZERO REPETITION RATE)

Purpose:

The purpose of this exercise is to show the effects of the higher promotion rates and zero repetition rates on enrollment. This exercise will also show how to use the ESM when data is not available for promotion and repetition separately. We can then use what is sometimes called the "apparent cohort" method where we assume the repeat rate or the dropout rate is zero. In this method the number of students in a class year is divided by the number of students in the previous class in the last year. In this exercise, changes will cover the elementary stage for boys, i.e., grd1 to grd6.

Steps:

1 - Copy yar16a.des and give it another name as follows:

copy yar16a.des exer4.des

2 - Look at the contents of the file; exer4.des by using the Norton Editor as follows:

ne exer4.des

3 - Use the down arrow to go to the efficiency rates, you will see the following data item:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	71%	18%	11%	0%	0%
1986	grd2	m	80%	10%	10%	0%	0%
1986	grd3	m	72%	17%	11%	0%	0%
1986	grd4	m	77%	13%	10%	0%	0%
1986	grd5	m	81%	9%	10%	0%	0%
1986	grd6	m	70%	5%	6%	19%	0%

4 - Add the value of repetition rate to promotion rate in each of these six courses and put the later as zero. Those rates will like the following:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	89%	0%	11%	0%	0%
1986	grd2	m	90%	0%	10%	0%	0%
1986	grd3	m	89%	0%	11%	0%	0%
1986	grd4	m	90%	0%	10%	0%	0%
1986	grd5	m	90%	0%	10%	0%	0%
1986	grd6	m	75%	0%	6%	19%	0%

5 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then press: **E**

6- Make an edit to the file by giving the following command:

medit exer4 -dmr nofile -dma nofile

If the results of the edit has errors look at your errors in the file exer4.oe by using the Norton Editor by giving the following command:

ne exer4.oe

Correct the errors in the input data file exer4.des and exit with save by pressing:

first **F3**
and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer4 1986 6 -yes esm

If the results of the simulation have errors look at your errors in the file exer1.os by using the Norton Editor by giving the following command:

ne exer4.os

Correct the errors in the input data file exer4.des and exit with save by pressing:

first **F3**
and then **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - when you have no errors in the simulation, produce table enrollment by course and year (ECY) for the period 1986 - 1991 by giving the following command:

mreport exer4 ecy 1986-1991

9 - look at the ECY table using the Norton Editor by giving the following command:

ne exer4.or

10 - compare the boys enrollment in the primary courses in ECY table that you just produced with the same data in the ECY table before the changes in the base year 1986 and the target year 1991.

Exercise 5

CHANGING THE EFFICIENCY RATES

IN THE

EDUCATION SIMULATION MODEL

(LOW PROMOTION RATE AND HIGHER REPETITION RATE)

Purpose:

The purpose of this exercise is to show the effects of the low promotion rates and higher repetition rates on enrollment. This is usually the case in low efficiency systems. In this exercise, changes will cover the elementary stage for boys, i.e., grd1 to grd6.

Steps:

1 - Copy yar16a.des and give it another name as follows:

copy yar16a.des exer5.des

2 - Look at the contents of the file; exer5.des by using the Norton Editor as follows:

ne exer5.des

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3 - Use the down arrow to go to the efficiency rates, you will see the following data item:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	89%	0%	11%	0%	0%
1986	grd2	m	90%	0%	10%	0%	0%
1986	grd3	m	89%	0%	11%	0%	0%
1986	grd4	m	90%	0%	10%	0%	0%
1986	grd5	m	90%	0%	10%	0%	0%
1986	grd6	m	75%	0%	6%	19%	0%

4 - Double the value of repetition rate and deduct the increase from the promotion rate in each of these six courses. Those rates will look like the following:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	53%	36%	11%	0%	0%
1986	grd2	m	70%	20%	10%	0%	0%
1986	grd3	m	55%	34%	11%	0%	0%
1986	grd4	m	64%	26%	10%	0%	0%
1986	grd5	m	72%	18%	10%	0%	0%
1986	grd6	m	65%	10%	6%	19%	0%

5 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then press: **E**

6 - Make an edit to the file by giving the following command:

medit exer5 -dmr nofile -dma nofile

If the results of the edit have errors, look at your errors in the file exer5.oe by using the Norton Editor using the following command:

ne exer5.oe

Correct the errors in the input data file exer5.des and exit with save by pressing:

first **F3**
and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - when you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer5 1986 6 -yes esm

If the results of the simulation has errors, look at the errors in the file exer1.os by using the Norton Editor by giving the following command:

ne exer5.os

Correct the errors in the input data file exer5.des and exit with save by press ing:

first **F3**
and then **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation, produce table enrollment by course and year (ECY) for the period 1986 - 1991 by giving the following command:

mreport exer5 ecy 1986-1991

9 - Look at the ECY table using the Norton Editor by giving the following command:

ne exer5.or

10 - Compare the boys enrollment in the primary courses in ECY table that you just produced with the same data in the ECY table before the changes in the base year 1986 and the target year 1991.

Exercise 6

CHANGING THE EFFICIENCY RATES

IN THE

EDUCATION SIMULATION MODEL

(LOW PROMOTION RATE AND HIGHER DROPOUT RATE)

Purpose:

The purpose of this exercise is to show the effects of the low promotion rates and higher dropout rates on enrollment. This is usually the case in low efficiency systems. In this exercise, changes will cover the elementary stage for boys, i.e., grd1 to grd6.

Steps:

1 - copy yar16a.des and give it another name as follows:

copy yar16a.des exer6.des

2 - look at the contents of the file; exer6.des by using the Norton Editor as follows:

ne exer6.des

3 - use the down arrow to go to the efficiency rates, you will see the following data item:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	71%	18%	11%	0%	0%
1986	grd2	m	80%	10%	10%	0%	0%
1986	grd3	m	72%	17%	11%	0%	0%
1986	grd4	m	77%	13%	10%	0%	0%
1986	grd5	m	81%	9%	10%	0%	0%
1986	grd6	m	70%	5%	6%	19%	0%

4 - Double the value of dropout rate and deduct the increase from the promotion rate in each of these six courses. Those rates will look like the following:

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	60%	18%	22%	0%	0%
1986	grd2	m	70%	10%	20%	0%	0%
1986	grd3	m	61%	17%	22%	0%	0%
1986	grd4	m	67%	13%	20%	0%	0%
1986	grd5	m	71%	9%	20%	0%	0%
1986	grd6	m	61%	5%	12%	19%	0%

5 - Save the file after the changes by using the Norton Editor as follows:

press: F3

then press: E

6 - Make an edit to the file by giving the following command:

medit exer6 -dmr nofile -dma nofile

If the results of the edit has errors, look at the errors in the file exer6.oe by using the Norton Editor by giving the following command:

ne exer6.oe

Correct the errors in the input data file exer6.des and exit with save by pressing:

first F3
and then E

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer6 1986 6 -yes esm

If the results of the simulation has errors, look at the errors in the file exer1.os by using the Norton Editor by giving the following command:

ne exer6.os

Correct the errors in the input data file exer6.des and exit with save by pressing:

first F3
and then E

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation produce table enrollment by course and year (ECY) for the period 1986 - 1991 by giving the following command:

mreport exer6 ecy 1986-1991

9 - Look at the ECY table using the Norton Editor by giving the following command:

ne exer6.or

10 - Compare the boys enrollment in the primary courses in ECY table that you just produced with the same data in the ECY table before the changes in the base year 1986 and the target year 1991.

Exercise 7

CHANGING THE STUDENT DISTRIBUTION RATIOS

IN THE

EDUCATION SIMULATION MODEL

(INCREASING STUDENTS RATIO IN EDU13 AND DECREASING THE RATIO IN LAWSH13)

Purpose:

The purpose of this exercise is to show the effects of the changes in students admission ratios between the faculties of the university. In this exercise, we want to increase the ratio of students in Faculty of Education and reduce the ratio of Faculty of Law, where the base year 1986 ratios (45% Law and 20% Education) will be reversed by the year 1990.

Steps:

1 - Copy yar16a.des and give it another name as follows:

copy yar16a.des exer7.des

2 - look at the contents of the file; exer7.des by using the Norton Editor as follows:

ne exer7.des

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3 - Use the down arrow to go to the promotion splitting rates, you will see the following data item:

#PSR -- promotion splitting rates

--	year	source course code	male, female, or each	promotion splitting rates					
	1986	**grd1**	**m**	**100%**					
	1986	**grd2**	**m**	**100%**					
	1986	**grd3**	**m**	**100%**					
	1986	**grd4**	**m**	**100%**					
	1986	**grd5**	**m**	**100%**					
--		grd6		gen7	ptti7	vtc7			
	1986	**grd6**	**m**	**95%**	**4%**	**1%**			
	1986	**gen7**	**m**	**100%**					
	1986	**gen8**	**m**	**100%**					
--		gen9		gen10	uptt10	isla10	agri10	comm10	intec10
	1986	**gen9**	**m**	**92%**	**3%**	**1%**	**1%**	**1%**	**2%**
	1986	**ptti7**	**m**	**100%**					
	1986	**ptti8**	**m**	**100%**					
	1986	**ptti9**	**m**	**100%**					
	1986	**ptti10**	**m**	**100%**					
	1986	**vtc7**	**m**	**100%**					
--		gen10		art11	scil1				
	1986	**gen10**	**m**	**45%**	**55%**				
	1986	**art11**	**m**	**100%**					
--		art12		sptt13	lib13	busec13	lawsh13	edu13	
	1986	**art12**	**m**	**0%**	**15%**	**20%**	**45%**	**20%**	
	1990	**art12**	**m**	**5%**	**10%**	**20%**	**45%**	**20%**	

4 - Go to the last line shown above and change the ratios in 1990 for the courses lawsh13 and edu13 to 20% and 45% respectively. Those ratios will look like the following:

	art12		sptt13	lib13	busec13	lawsh13	edu13
1986	art12	m	0%	15%	20%	45%	20%
1990	art12	m	5%	10%	20%	20%	45%

5 - Save the file after the changes by using the Norton Editor as follows:

press **F3**
then press **E**

6 - Make an edit to the file by giving the following command:

medit exer7 -dmr nofile -dma nofile

If the results of the edit has errors, look at the errors in the file exer7.oe by using the Norton Editor by giving the following command:

ne exer7.oe

Correct the errors in the input data file exer7.des and exit with save by pressing:

first **F3**
and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer7 1986 6 -yes esm

If the results of the simulation have errors, look at the errors in the file exer1.os by using the Norton Editor by giving the following command:

ne exer7.os

Correct the errors in the input data file exer7.des and exit with save by pressing:

first: **F3**
and then: **E**

Continue to do these steps each time you have errors until you have zero errors.

8 - When you have no errors in the simulation produce table enrollment by course and year (ECY) for the period 1986 - 1991 by giving the following command:

mreport exer7 ecy 1986-1991

9 - Look at the ECY table using the Norton Editor by giving the following command:

ne exer7.or

10 - Compare the boys enrollment in the Faculties of Education and Law in ECY table that you just produced with the same data in the ECY table before the changes in the base year 1986 and the target year 1991.

Results Comparison of Exercise 4, Exercise 5, Exercise 6, and Exercise 7:

The pcy tables produced in the four previous exercises and the original one without changes are shown below. After doing the exercises you should get the same results. Compare the enrollment in the primary grades for exercises 4, 5, and 6 with the original, i.e., without the changes and trace the effects of changing the efficiency rates on theenrollment by grade and the total. Do the same comparison with regards to exercise 7, trace the effects of changing the student admission ratios to the faculties of Education and Law on their respective enrollment by grade and total faculty.

Enrollment Summary by Course and Year for 1986-1991
(ECY) Primary

ORIGINAL RUN YAR16A, NO CHANGES

Course		Year 1986	1987	1988	1989	1990	1991
grd1	male	180180	218017	232482	243056	253257	263734
grd2	male	155447	143473	169140	181976	190767	198889
grd3	male	140983	148325	139993	159111	172630	181961
grd4	male	113743	116294	121912	116644	129723	141158
grd5	male	91195	95790	98168	102707	99059	108802
grd6	male	93307	78533	81516	83592	87373	84607
total		774855	800432	843211	887086	932809	979151

Enrollment Summary by Course and Year for 1986-1991
(ECY) Primary

(EXER4: HIGHER PROMOTION RATE AND ZERO REPETITION RATE)

Course		Year 1986	1987	1988	1989	1990	1991
grd1	male	180180	185585	193239	201209	209507	218148
grd2	male	155447	160360	165171	171983	179076	186461
grd3	male	140983	139902	144324	148654	154784	161168
grd4	male	113743	125475	124513	128449	132302	137758
grd5	male	91195	102369	112927	112062	115604	119072
grd6	male	93307	82076	92132	101635	100856	104043
total		774855	795767	832306	863992	892129	926650

Enrollment Summary by Course and Year for 1986-1991
(ECY) Primary

(EXER5: HIGHER REPETITION RATE AND LOW PROMOTION)

Course		Year 1986	1987	1988	1989	1990	1991
grd1	male	180180	250450	283401	303233	318671	332870
grd2	male	155447	126585	158055	181814	197076	208311
grd3	male	140983	156747	141903	158886	181291	199592
grd4	male	113743	107114	114061	107703	115390	129711
grd5	male	91195	89211	84611	88229	84811	89115
grd6	male	93307	74991	71731	68093	70334	68097
total		774855	805098	853762	907958	967573	1027696

Enrollment Summary by Course and Year for 1986-1991
(ECY) Primary

(EXER6: HIGHER DROPOUT RATE AND LOW PROMOTION)

Course		Year 1986	1987	1988	1989	1990	1991
grd1	male	180180	218017	232482	243056	253257	263734
grd2	male	155447	123653	143176	153807	161214	168076
grd3	male	140983	132780	109129	118775	127857	134585
grd4	male	113743	100786	94098	78802	82697	88743
grd5	male	91195	84415	75124	69807	59080	60724
grd6	male	93307	69414	63406	56508	52388	44566
total		774855	729065	717415	720755	736493	760428

Enrollment Summary by Course and Year for 1986-1991
(ECY) Faculties of Law and Education

ORIGINAL RUN YAR16A, NO CHANGES

Course	Year 1986	1987	1988	1989	1990	1991
lawyr 1 total	1700	1558	1404	1190	1199	1161
lawyr 2 total	1238	1167	1071	966	822	821
lawyr 3 total	1025	1165	1108	1019	921	786
lawyr 4 total	649	955	1097	1052	970	877
total	4612	4845	4680	4227	3912	3645
eduyr 1 total	1199	978	896	884	903	890
eduyr 2 total	362	917	780	711	698	713
eduyr 3 total	273	339	843	744	677	662
eduyr 4 total	132	252	318	774	708	645
total	1966	2486	2837	3113	2986	2910

Enrollment Summary by Course and Year for 1986-1991
(ECY) Faculties of Law and Education

(EXER7:INCREASING ADMISSION IN EDUCATION AND REDUCING ADMISSION IN LAW)

Course	Year 1986	1987	1988	1989	1990	1991
lawyr 1 total	1700	1558	1281	1008	931	826
lawyr 2 total	1238	1167	1071	886	699	640
lawyr 3 total	1025	1165	1108	1019	849	672
lawyr 4 total	649	955	1097	1052	970	877
total	4612	4845	4557	3965	3449	2950
eduyr 1 total	1199	978	1019	1066	1171	1225
eduyr 2 total	362	917	780	803	840	921
eduyr 3 total	273	339	843	744	760	794
eduyr 4 total	132	252	318	774	708	719
total	1966	2486	2960	3387	3479	3659

Exercises on Starting a New Run for the Manpower Requirement Model

Introduction

These exercises are designed to provide practice in beginning the Manpower Requirements Model run.

Exercise 8

STARTING A NEW RUN FOR THE

MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to start using the Manpower Requirements Model from the beginning. In this exercise we assume that we have only three sectors in the economy. These sectors are agriculture, mining and quarrying, and manufacturing. We are required to use the MRM to derive the manpower demand for these three sectors by occupation during the present Five-Year Plan period.

Steps:

1 - There is a file that comes with the MEM called eg.dmr, you can use this file to start constructing the MRM by copying it under a different name as follows:

copy eg.dmr

and give it another name as follows:

copy eg.dmr exer8.dmr

2 - Look at the contents of the file exer8.dmr by using the Norton Editor as follows:

ne exer8.dmr

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you will see that file eg.dmr has no data but the headings of the data item of the file. You are required to put the data under each heading by following these steps:

3 - Move the arrow down until you reach the data items in the file and then type the required information just by following the instructions in each data item.

#DESC -- data description
-- description
-- text

describe your work in here, for example, type **this run includes three sectors only**

#TITLE -- report title
-- title
-- text

type your name and date under this item

#UNITS -- units of output
-- output
-- units

YEMENI RIYALS ('000s)

#SEC -- economic sectors

--	sector code	sector title

type in here the three sectors that included:

agr	**agriculture and fishing**
m&q	**mining and querrying**
mfg	**manufacturing**

#OCC -- occupation groups

--	occupation code	occupation title

type in here the occupational groups we are using:

A-1	**university science/math based professionals**
A-2	**university non-science/math based professional**
B-1	**science/math based technician with post-secondary**
B-2	**non-science/math based sub-professional with post-secondary**
C	**skilled and semi-skilled office**
D	**skilled and semi-skilled manual**
E	**semi-skilled requiring functional literacy plus OJT**
F	**unskilled requiring no special education or training**

#OUT -- sectoral output
-- sector
-- year code output

type in here the output of the three sectors in the base year 1986:

1986 agr 10680
1986 m&q 506
1986 mfg 4620

then type the growth rate of output in each sector during the projection period:

1987 agr g3%
1987 m&q g59.6%
1987 mfg g9%

#EMP -- sectoral employment
-- sector
-- year code employment

type in here the employment for each sector in the base year, 1986:

1986 agr 933500
1986 m&q 6400
1986 mfg 57800

#PRD -- labor productivity

--	year	sector code	productivity

type the growth rate of productivity in each sector during the projection period:

1986	**agr**	**g1.7%**
1986	**m&q**	**g27.7%**
1986	**mfg**	**g0.5%**

#EDF -- employment distribution fractions

--	year	sector code	occupation code	fraction of sector employment

type in here the occupational distribution (in percentages) within each sector:

1986	**agr**	**A-1**	**0.07%**
1986	**agr**	**A-2**	**0.04%**
1986	**agr**	**B-1**	**0.39%**
1986	**agr**	**B-2**	**0.04%**
1986	**agr**	**C**	**0.30%**
1986	**agr**	**D**	**0.20%**
1986	**agr**	**E**	**0.40%**
1986	**agr**	**F**	**98.56%**
1986	**m&q**	**A-1**	**1.00%**
1986	**m&q**	**A-2**	**1.00%**
1986	**m&q**	**B-1**	**1.00%**
1986	**m&q**	**B-2**	**0.00%**
1986	**m&q**	**C**	**1.50%**
1986	**m&q**	**D**	**3.00%**
1986	**m&q**	**E**	**5.60%**
1986	**m&q**	**F**	**86.90%**

1986	mfg	A-1	0.40%
1986	mfg	A-2	0.50%
1986	mfg	B-1	0.80%
1986	mfg	B-2	0.60%
1986	mfg	C	3.00%
1986	mfg	D	6.00%
1986	mfg	E	12.00%
1986	mfg	F	76.70%

4 - Save the file after the data entry by using the Norton Editor by pressing:

F3 and then E

5 - Make an edit to the file by giving the following command:

medit exer8 -des nofile -dma nofile

If the results of the edit has errors look at the errors in the file exer8.oe by using the Norton Editor by giving the following command:

ne exer8.oe

Correct the errors in the input data file exer8.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer8 1986 6 -yes mrm

If the results of the simulation has errors look at the errors in the file exer8.os by using the Norton Editor by typing the following command:

ne exer8.os

Correct the errors in the input data file exer8.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors in the simulation produce table manpower requirements by sector and occupation (MRSO) for the projection years 1986 to 1991 by giving the following command:

mreport exer8 mrso 1986-1991

8 - Look at the MRSO table using the Norton Editor by giving the following command:

ne exer8.or

9 - Compare the results you have with the tables at the end of the section. If the figures are the same your work is correct. If your work is correct, use the Norton Editor to condense the MRSO tables you produced so they look like the tables included at the end of this section.

10 - Write down, on a separate sheet of paper, the data you needed to enter in the model and their sources, in addition to the assumptions you had to enter in the model.

Exercise 9

ADDING THE REST OF THE SECTORS

TO THOSE IN EXERCISE 8 IN THE MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to continue adding the rest of the sectors to those inputed in the Manpower Requirements Model in exercise 8. In this exercise we are required to use the MRM to derive the manpower demand for all the sectors by occupation during the present Five-Year Plan period.

Requirements and Steps:

In this exercise you are required to input the rest of the sectors of the economy to the three sectors included in exercise 8. You can follow the same steps detailed in exercise 8, but this time with respect to the newly added sectors.

In summary, you are required to:

1 - Copy the exercise(8 data file with the name of exercise 9.

2 - Use the Norton Editor to look at that file and to enter the data of the added sectors. The data you need to enter for these sectors are given to you at the end of this exercise.

3 - Save the file after the data entry by using the Norton Editor.

4 - Make an edit to the data file. If the results of the edit has errors look at the errors in the file exer9.oe by using the Norton Editor.

Correct the errors in the input data file exer9.dmr and exit with save.

Continue to do these steps each time you have errors until you have zero errors.

5 - When you have no errors, do the simulation (i.e., projection) for the six years 1986-1991.

If the results of the simulation has errors look at the errors in the file exer9.os by using the Norton Editor .

Correct the errors in the input data file exer9.dmr and exit with save.

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors in the simulation produce any table you choose from the output tables of MRM listed in handout 1 for the years 1986 to 1991.

7 - Look at the tables you produced using the Norton Editor and summarize them in condensed forms.

8 - Write down on a separate sheet of paper the data you needed to enter in the model and their sources, in addition to the assumptions you had to enter in the model.

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Data to be entered in the data file exerc9.dmr (mentioned in step 2 above):

```
#SEC -- economic sectors
--      sector          sector
--       code            title

        util    utilities-electricity and water
        con     construction
        trh     trades & hotels
        t&c     transportation and communication
        b&f     banking, finance, business services
        ser     private and public services


#OUT -- sectoral output
--              sector
--      year    code    output

        1986    util      220
        1986    con      1285
        1986    trh      4896
        1986    t&c      4106
        1986    b&f      4166
        1986    ser      4746

        1987    util      g15%
        1987    con       g5.2%
        1987    trh       g5.7%
        1987    t&c       g7.2%
        1987    b&f       g6.5%
        1987    ser       g8.1%
```

```
#EMP -- sectoral employment
--              sector
--      year    code    employment

        1986    util      51400
        1986    con      110700
        1986    trh      125300
        1986    t&c       45000
        1986    b&f       20800
        1986    ser      255300


#PRD -- labor productivity
--              sector
--      year    code    productivity

        1986    util     g10.1%
        1986    con      g1.4%
        1986    trh      g1.9%
        1986    t&c      g2.0%
        1986    b&f      g1.0%
        1986    ser      g1.1%
```

#EDF -- employment distribution fractions

-- year	sector code	occupation code	fraction of sector employment
1986	util	A-1	3.00%
1986	util	A-2	1.00%
1986	util	B-1	4.60%
1986	util	B-2	2.00%
1986	util	C	6.00%
1986	util	D	25.00%
1986	util	E	17.00%
1986	util	F	41.40%
1986	con	A-1	0.10%
1986	con	A-2	0.10%
1986	con	B-1	0.10%
1986	con	B-2	0.00%
1986	con	C	0.70%
1986	con	D	2.00%
1986	con	E	28.00%
1986	con	F	69.00%
1986	trh	A-1	0.10%
1986	trh	A-2	0.10%
1986	trh	B-1	0.30%
1986	trh	B-2	2.00%
1986	trh	C	37.00%
1986	trh	D	1.00%
1986	trh	E	21.00%
1986	trh	F	38.50%
1986	t&c	A-1	0.20%
1986	t&c	A-2	0.20%
1986	t&c	B-1	0.50%
1986	t&c	B-2	0.20%

1986	t&c	C	1.80%
1986	t&c	D	4.20%
1986	t&c	E	2.40%
1986	t&c	F	90.50%
1986	b&f	A-1	2.00%
1986	b&f	A-2	4.00%
1986	b&f	B-1	5.00%
1986	b&f	B-2	6.00%
1986	b&f	C	51.00%
1986	b&f	D	0.30%
1986	b&f	E	4.20%
1986	b&f	F	27.50%
1986	ser	A-1	3.70%
1986	ser	A-2	3.70%
1986	ser	B-1	5.20%
1986	ser	B-2	10.00%
1986	ser	C	20.00%
1986	ser	D	9.40%
1986	ser	E	4.00%
1986	ser	F	44.00%

Manpower Requirements by Sector and Occupation for 1986-1991 (MRSO)

Sector	A-1	A-2	B-1	B-2	C	D	E	F	total
1986									
agric	653	373	3641	373	2801	1867	3734	920058	933500
min&quar	64	64	64	0	96	192	358	5562	6400
manufact	231	289	462	347	1734	3468	6936	44333	57800
total	949	726	4167	720	4631	5527	11028	969952	997700
1987									
agric	662	378	3687	378	2836	1891	3782	931818	945433
min&quar	80	80	80	0	120	240	448	6951	7999
manufact	251	313	502	376	1881	3761	7523	48082	62689
total	993	772	4269	754	4837	5892	11752	986851	1016120
1988									
agric	670	383	3734	383	2873	1915	3830	943730	957518
min&quar	100	100	100	0	150	300	560	8687	9997
manufact	272	340	544	408	2040	4079	8159	52149	67991
total	1042	823	4378	791	5062	6294	12549	1004566	1035505
1989									
agric	679	388	3782	388	2909	1940	3929	968011	969757
min&quar	125	156	125	0	187	375	700	10857	12494
manufact	295	369	590	442	2212	4424	8849	56559	73741
total	1099	882	4497	830	5309	6739	13428	1023210	1055993
1990									
agric	688	393	3830	393	2946	1964	3929	968011	982154
min&quar	156	156	156	0	234	468	874	13570	15615
manufact	320	400	640	480	2399	4799	9597	61343	79978
total	1164	949	4626	873	5580	7231	14400	1042923	1077747
1991									
agric	696	398	3879	398	2984	1989	3979	980384	994708
min&quar	195	195	195	0	293	585	1093	16959	19516
manufact	347	434	694	520	2602	5205	10409	66531	86742
total	1238	1027	4768	918	5879	7779	15481	1063875	1100966

Occupation Key

A-1	university science/math based professionals
A-2	university non-science/math based professional
B-1	science/math based technician with post-secondary
B-2	non-science/math based sub-professional with post-secondary
C	skilled and semi-skilled office
D	skilled and semi-skilled manual
E	semi-skilled requiring functional literacy plus OJT
F	unskilled requiring no special education or training

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Exercises on Starting a New Run for the Education Simulation Model

Exercise 10

STARTING A NEW RUN FOR THE

EDUCATION SIMULATION MODEL

Purpose:

The purpose of this exercise is to start using the Education Simulation Model from the beginning. In this exercise we assume that we have the six grades of primary boys in the educational system only. We are required to use the ESM to make educational projections for those six grades during the present Five-Year Plan period 1986-1991.

Steps:

1 - There is a file that comes with the MEM called eg.des, you can use this file to start constructing the ESM by copying it under a different name as follows:

copy eg.des

Give it another name as follows:

copy eg.des exer10.des

2 - Look at the contents of the file; exer10.des by using the Norton Editor as follows:

ne exer10.des

You will see that file eg.dmr has no data but the headings of the data item of the file. You are required to put the data under each heading by following these steps:

3 - Move the arrow down until you reach the data items in the file and then type the required information just by following the instructions in each data item.

#DESC -- data description
-- description
-- text

Describe your work in here, for example, type:

this run includes six grades of primary for boys

#TITLE -- report title

-- title
-- text

Type your name and date under this item.

#AGE - age range
-- minimum maximum
-- age age

Type in here the age range of your education system, in this case it is:

5 15

A13 1

#TG -- teacher groups

--	teacher	teacher
--	group	group
--	code	title

Define in here the teacher groups of the education system:

elem	**elementary**

#CL -- course levels

--	course	course
--	level	level
--	code	title

Define in here the education level of the system:

elem	**elementary**

#COR -- courses

--	number	males,		teacher	course	
--	course ideal	of	females,	terminal group	level	course
--	code age	ages	or both	course? code	code	title

Type here the structure of the education system:

grd1	**6**	**1**	**m**	**n**	**elem**	**elem**	**grade1**
grd2	**7**	**1**	**m**	**n**	**elem**	**elem**	**grade2**
grd3	**8**	**1**	**m**	**n**	**elem**	**elem**	**grade3**
grd4	**9**	**1**	**m**	**n**	**elem**	**elem**	**grade4**
grd5	**10**	**1**	**m**	**n**	**elem**	**elem**	**grade5**
grd6	**11**	**1**	**m**	**y**	**elem**	**elem**	**grade6**

#EC -- enrollment capacities

```
--                male,
--       course   female, enrollment
--       year  code or each capacity
```

This is an optional item, do not use it in this run.

#CPS -- cost per student

```
--              cost
--       course  per
--    year  code student
```

This is an optional item, do not use it in this run.

#STR -- student teacher ratios

```
--                students
--          course  per
--    year  code  teacher
```

This is an optional item, do not use it in this run.

#OR -- outcomes rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate

Include in here the outcome rates of the system. Course (grd6) in here is considered terminal and its promotion rate should be added to the graduate rate.

1986	**grd1**	**m**	**71%**	**18%**	**11%**	**0%**	**0%**
1986	**grd2**	**m**	**80%**	**10%**	**10%**	**0%**	**0%**
1986	**grd3**	**m**	**72%**	**17%**	**11%**	**0%**	**0%**
1986	**grd4**	**m**	**77%**	**13%**	**10%**	**0%**	**0%**
1986	**grd5**	**m**	**81%**	**9%**	**10%**	**0%**	**0%**
1986	**grd6**	**m**	**0%**	**5%**	**6%**	**89%**	**0%**

#PC - promotion courses

--	source course code	promotion course code

In here you define the flow of the student in the system:

grd1	**grd2**
grd2	**grd3**
grd3	**grd4**
grd4	**grd5**
grd5	**grd6**

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#PSR -- promotion splitting rates
-- source male, promotion
-- course female, splitting
-- year code or each rates

In here you put the ratio of the flow of students from one course to the other:

1986 grd1 m 100%
1986 grd2 m 100%
1986 grd3 m 100%
1986 grd4 m 100%
1986 grd5 m 100%

#TC -- transfer courses
-- source transfer
-- course course
-- code codes

This is an optional item, do not use it in this run.

#TSR -- transfer splitting rates
-- source male, transfer
-- course female, splitting
-- year code or each rates

This is an optional item, do not use it in this run.

4 - Save the file after the data entry by using the Norton Editor by pressing:

F3 and then **E**

5 - Make an edit to the file by giving the following command:

medit exer10 - dmr nofile - dma nofile

If the results of the edit has errors, look at the errors in the file exer10.oe by using the Norton Editor by giving the following command:

ne exer10.oe

Correct the errors in the input data file exer10.des and exit with save by pressing.

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer10 1986 6 - yes esm

If the results of the simulation have errors, look at the errors in the file exer10.os by using the Norton Editor by giving the following command:

ne exer10.os

Correct the errors in the input data file exer10.des and exit with save by pressing:

F3 and then **E**

AIS

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors in the simulation, produce table enrollment by course and year (ECY) for the projection years 1986 to 1991 by giving the following command:

mreport exer10 ecy 1986-1991

8 - Look at the ECY table using the Norton Editor by giving the following command:

ne exer10.or

9 - Compare the results you have with the tables at the the end of the handout, if the figures are the same your work is correct.

10 - Write down on a separate sheet of paper the data you needed to enter in the model and their sources, in addition to the assumptions you had to enter in the model.

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Exercise 11

ADDING THE INTERMEDIATE AND SECONDARY COURSES TO THE PRIMARY COURSES IN EXERCISE 10 IN THE EDUCATION SIMULATION MODEL

Purpose:

The purpose of this exercise is to continue adding the intermediate and secondary courses input in exercise 10 in the Education Simulation Model. In this exercise we are required to use the ESM to make education projections for the primary, intermediate and secondary stages for boys during the present Five-Year Plan period 1986-1991.

Requirements and Steps:

In this exercise you are required to input the rest of the intermediate and secondary courses for boys in addition to those of the primary that included in exercise 10. You can follow the same steps detailed in exercise 10 but this time with respect to the newly added courses.

In summary you required to:

1 - Copy the exercise 10 data file with the name exercise 11.

2 - Use the Norton Editor to look at that file and to enter the data of the added courses.

The data you need to enter for these courses are given to you at the end of this exercise.

3 - Save the file after the data entry by using the Norton Editor.

4 - Make an edit to the data file.

If the results of the edit has errors, look at the errors in the file exer11.oe by using the Norton Editor.

Correct the errors in the input data file exer11.des and exit with save.

Continue to do these steps each time you have errors until you have zero errors.

5 - When you have no errors, do the simulation (i.e., projection) for the six years 1986-1991.

If the results of the simulation has errors, look at the errors in the file exer11.os by using the Norton Editor.

Correct the errors in the input data file exer11.des and exit with save.

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors in the simulation produce any table you choose from the output tables of ESM listed in section 2 for the years 1986 to 1991.

7 - Look at the tables you produced using the Norton Editor and compare the results of table ECY with the table at the end of this section, if the figures are the same your work is correct.

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8 - Write down on a separate sheet of paper the data you needed to enter in the model and their sources, in addition to the assumptions you had to enter in the model.

Data to be entered in the data file exerc11.des (mentioned in step 2 above)

#AGE -- age range
-- minimum maximum
-- age age

5 24

#TG -- teacher groups
-- teacher teacher
-- group group
-- code title

elem elementary
inter intermediate
sec secondary

#CL - course levels
-- course course
-- level level
-- code title

elem elementary
inter intermediate
sec secondary

#COR -- courses

-- course code	ideal age	number of ages	males, females, or both	terminal course?	teacher course group code	level code	course title
grd1	6	1	m	n	elem	elem	grade 1
grd2	7	1	m	n	elem	elem	grade 2
grd3	8	1	m	n	elem	elem	grade 3
grd4	9	1	m	n	elem	elem	grade 4
grd5	10	1	m	n	elem	elem	grade 5
grd6	11	1	m	y	elem	elem	grade 6
gen7	12	1	m	n	inter	inter	general 7
gen8	13	1	m	n	inter	inter	general 8
gen9	14	1	m	y	inter	inter	general 9
gen10	15	1	m	n	sec	sec	general10
art11	16	1	m	n	sec	sec	art11
art12	17	1	m	y	sec	sec	art12
sci11	16	1	m	n	sec	sec	science11
sci12	17	1	m	y	sec	sec	science12

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate
1986	grd1	m	71%	18%	11%	0%	0%
1986	grd2	m	80%	10%	10%	0%	0%
1986	grd3	m	72%	17%	11%	0%	0%
1986	grd4	m	77%	13%	10%	0%	0%
1986	grd5	m	81%	9%	10%	0%	0%
1986	grd6	m	70%	5%	6%	19%	0%

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1986	gen7	m	80%	10%	10%	0%	0%
1986	gen8	m	90%	5%	5%	0%	0%
1986	gen9	m	82%	8%	5%	5%	0%
1986	gen10	m	65%	8%	27%	0%	0%
1986	art11	m	82%	6%	12%	0%	0%
1986	art12	m	0%	5%	1%	94%	0%
1986	sci11	m	82%	10%	8%	0%	0%
1986	sci12	m	0%	8%	2%	90%	0%

#PC -- promotion sources
-- source promotion
-- course course
-- code codes

grd1 grd2
grd2 grd3
grd3 grd4
grd4 grd5
grd5 grd6

grd6 gen7
gen7 gen8
gen8 gen9

gen9 gen10
gen10 art11 sci11
art11 art12
sci11 sci12

#NES -- persons not entering school

-- year	age	male, female, or each	number not entering
1986	6	m	20000
1996	6	m	0

#ENR -- enrollments

-- year	course code	student age	male, female, or each	number enrolled
1986	grd1	6	m	180180
1986	grd2	7	m	155447
1986	grd3	8	m	140983
1986	grd4	9	m	113743
1986	grd5	10	m	91195
1986	grd6	11	m	93307
1986	gen7	12	m	59623
1986	gen8	13	m	35977
1986	gen9	14	m	26408
1986	gen10	15	m	15960
1986	art11	16	m	6000
1986	art12	17	m	5000
1986	sci11	16	m	4000
1986	sci12	17	m	3000

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Exercise 12

ADDING THE PRIMARY, INTERMEDIATE, AND SECONDARY GIRLS EDUCATION TO THE BOYS EDUCATION IN EXERCISE 11 IN THE EDUCATION SIMULATION MODEL

Purpose:

The purpose of this exercise is to contine adding the girls education of primary, intermediate, and secondary to the boys education tables in exercise 10. In this exercise, you are required to use the ESM to make education projections for the primary, intermediate and secondary stages for the girls in addition to the boys education during the present Five-Year Plan period 1986-1991.

Requirements and Steps:

You can follow the same steps detailed in exercise 10, but this time with respect to the newly added girls courses. The information and data to be entered are found in section xx.

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Table Produced in Exercise 10

Enrollment Summary by Course and Year for 1986-1991 (ECY)

Course			Year					
			1986	1987	1988	1989	1990	1991
grd1	grade 1	male	180180	218017	232482	243056	253257	263734
grd2	grade 2	male	155447	143473	169140	181976	190767	198889
grd3	grade 3	male	140983	148325	139993	159111	172630	181961
grd4	grade 4	male	113743	116294	121912	116644	129723	141158
grd5	grade 5	male	91195	95790	98168	102707	99059	108802
grd6	grade 6	male	93307	78533	81516	383592	87373	84607

Table Produced in Exercise 11

Enrollment Summary by Course and Year for 1986-1991
(ECY)

Course			Year 1986	1987	1988	1989	1990	1991
grd1	grade 1	male	180180	218017	232482	243056	253257	263734
grd2	grade 2	male	155447	143473	169140	181976	190767	198889
grd3	grade 3	male	140983	148325	139993	159111	172630	181961
grd4	grade 4	male	113743	116294	121912	116644	129723	141158
grd5	grade 5	male	91195	95790	98168	102707	99059	108802
grd6	grade 6	male	93307	78533	81516	83592	87373	84607
gen 1	gen 1	male	59623	71277	62101	63272	64841	67645
gen 2	gen 2	male	35977	49497	59497	52656	53250	54536
gen 3	gen 3	male	26408	34492	47307	57332	51977	52083
gen 10	gen 10	male	15960	22931	30118	41201	50308	46645
art 11	art 11	male	6000	5028	7009	9230	12605	15471
art 12	art 12	male	5000	5170	4382	5967	7867	10730
sci 11	sci 11	male	4000	6106	8809	11648	15894	19575
sci 12	sci 12	male	3000	3520	5288	7646	10163	13846

Exercise on Changing the Base Year from 1986 to 1988 in the Manpower Requirement Model

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Exercise 13

CHANGING THE BASE YEAR FROM 1986 TO 1988

IN THE

MANPOWER REQUIREMENTS MODEL

Purpose:

The purpose of this exercise is to change the base year of the data file from 1986 to 1988 using new set of data in the Manpower Requirements Model.

Steps:

1 - Copy yar16a.dmr and give it another name as follows:

copy yar16a.dmr exer13.dmr

2 - Look at the contents of the file; exer13.dmr by using the Norton Editor as follows:

ne exer13.dmr

3 - Move the arrow down until you reach the data items in the file and then type the required information just by following the instructions in each data item.

#OUT -- sectoral output

-- sector

-- year code output

-- change the base year from 1986 to **1988**

-- change the first projection year 1987 to **1989**

-- change also the numbers for 1988 given to you

-- the data item will look like the following:

1988	**agr**	**11330**
1988	**m&q**	**1289**
1988	**mfg**	**5489**
1988	**util**	**291**
1988	**con**	**1422**
1988	**trh**	**5470**
1988	**t&c**	**4718**
1988	**b&f**	**4725**
1988	**ser**	**5546**

1989	**agr**	**g3%**
1989	**m&q**	**g59.6%**
1989	**mfg**	**g9%**
1989	**util**	**g15%**
1989	**con**	**g5.2%**
1989	**trh**	**g5.7%**
1989	**t&c**	**g7.2%**
1989	**b&f**	**g6.5%**
1989	**ser**	**g8.1%**

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#EMP -- sectoral employment

```
--              sector
--      year    code    employment
```

-- change the base year from 1986 to 1988
-- change also the numbers for 1988 given to you
-- the data item will look like the following:

1988	agr	957518
1988	m&q	9997
1988	mfg	67991
1988	util	56077
1988	con	119153
1988	trh	134819
1988	t&c	49705
1988	b&f	23127
1988	ser	291877

#PRD -- labor productivity

```
--              sector
--      year    code    productivity
```

-- change the base year from 1986 to 1988
-- the data item will look like the following:

1988	agr	g1.7%
1988	m&q	g27.7%
1988	mfg	g0.5%
1988	util	g10.1%
1988	con	g1.4%
1988	trh	g1.9%
1988	t&c	g2.0%
1988	b&f	g1.0%
1988	ser	g1.1%

#EDF -- employment distribution fractions

--	year	sector code	occupation code	fraction of sector employment

-- change the base year from 1986 to **1988**

-- the data item will look like the following:

1988	**agr**	**A-1**	**0.07%**
1988	**agr**	**A-2**	**0.04%**
1988	**agr**	**B-1**	**0.39%**
1988	**agr**	**B-2**	**0.04%**
1988	**agr**	**C**	**0.30%**
1988	**agr**	**D**	**0.20%**
1988	**agr**	**E**	**0.40%**
1988	**agr**	**F**	**98.56%**
1988	**m&q**	**A-1**	**1.00%**
1988	**m&q**	**A-2**	**1.00%**
1988	**m&q**	**B-1**	**1.00%**
1988	**m&q**	**B-2**	**0.00%**
1988	**m&q**	**C**	**1.50%**
1988	**m&q**	**D**	**3.00%**
1988	**m&q**	**E**	**5.60%**
1988	**m&q**	**F**	**86.90%**
1988	**mfg**	**A-1**	**0.40%**
1988	**mfg**	**A-2**	**0.50%**
1988	**mfg**	**B-1**	**0.80%**
1988	**mfg**	**B-2**	**0.60%**
1988	**mfg**	**C**	**3.00%**
1988	**mfg**	**D**	**6.00%**
1988	**mfg**	**E**	**12.00%**
1988	**mfg**	**F**	**76.70%**
1988	**util**	**A-1**	**3.00%**
1988	**util**	**A-2**	**1.00%**
1988	**util**	**B-1**	**4.60%**
1988	**util**	**B-2**	**2.00%**

1988	util	C	6.00%
1988	util	D	25.00%
1988	util	E	17.00%
1988	util	F	41.40%
1988	con	A-1	0.10%
1988	con	A-2	0.10%
1988	con	B-1	0.10%
1988	con	B-2	0.00%
1988	con	C	0.70%
1988	con	D	2.00%
1988	con	E	28.00%
1988	con	F	69.00%
1988	trh	A-1	0.10%
1988	trh	A-2	0.10%
1988	trh	B-1	0.30%
1988	trh	B-2	2.00%
1988	trh	C	37.00%
1988	trh	D	1.00%
1988	trh	E	21.00%
1988	trh	F	38.50%
1988	t&c	A-1	0.20%
1988	t&c	A-2	0.20%
1988	t&c	B-1	0.50%
1988	t&c	B-2	0.20%
1988	t&c	C	1.80%
1988	t&c	D	4.20%
1988	t&c	E	2.40%
1988	t&c	F	90.50%
1988	b&f	A-1	2.00%
1988	b&f	A-2	4.00%
1988	b&f	B-1	5.00%
1988	b&f	B-2	6.00%
1988	b&f	C	51.00%
1988	b&f	D	0.30%
1988	b&f	E	4.20%
1988	b&f	F	27.50%

1988	ser	A-1	3.70%
1988	ser	A-2	3.70%
1988	ser	B-1	5.20%
1988	ser	B-2	10.00%
1988	ser	C	20.00%
1988	ser	D	9.40%
1988	ser	E	4.00%
1988	ser	F	44.00%

-- end of data --

4 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**
then press: **E**

5 - Make an edit to the file by giving the following command:

medit exer13 -des nofile -dma nofile

If the results of the edit has errors look at the errors in the file exer13.oe by using the Norton Editor by giving the following command:

ne exer13.oe

Correct the errors in the input data file exer13.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer13 1986 6 -yes mrm

If the results of the simulation have errors look at the errors in the file exer13.os by using the Norton Editor by giving the following command:

ne exer13.os

Correct the errors in the input data file exer13.dmr and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors in the simulation produce table employment by sector and year (ESY) for the years 1988 - 1993 by giving the following command:

mreport exer13 esy 1988-1993

8 - Look at the ESY table using the Norton Editor by giving the following command:

ne exer13.or

9 - Exit from the Norton Editor by pressing:

F3 and **E**

A36

10 - Copy your input data file and your report on a disk by following these steps:

- Put a disk in the A drive.
- Give the following commands:

copy exer13.dmr a: < >

copy exer13.or a: < >

Then see the two files you just copied on the disk in the A drive by giving the following command:

dir a:

11 - Check your work by comparing the ESY table you produced with the following ESY table, if you have the same figures then your work is correct.

Employment by Course and Year for 1983-1993
(ESY)

	Year					
Sector	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**
agriculture	957518	969758	982154	994708	1007423	1020301
mining and qu	9997	12494	15615	19516	24391	30485
manufacturing	67991	73741	79978	86743	94079	102036
utilities-ele	56077	58573	61179	63902	66746	69717
construction	119153	123618	128251	133057	138044	143217
trades & hotel	134819	139847	145062	150471	156083	161903
transportation	49705	52239	54902	57701	60643	63734
banking, finance	23127	24386	25714	27115	28591	30148
private and pub	291877	312086	333694	356799	381503	407918
total	1710264	1766743	1826551	1890013	1957503	2029458

A51

Exercises on Changing the Base Year from 1986 to 1988 in the Education Simulation Model

A38

Exercise 14

CHANGING THE BASE YEAR FROM 1986 TO 1988

IN THE

EDUCATION SIMULATION MODEL

Purpose:

The purpose of this exercise is to change the base year of the data file from 1986 to 1988 using new set of data in the Education Simulation Model.

Steps:

1 - Copy yar16a.des and give it another name as follows:

copy yar16a.des exer14.des

2 - Look at the contents of the file; exer14.des by using the Norton Editor as follows:

ne exer14.des

3 - Move the arrow down until you reach the data items in the file and then type the required information just by following the instructions in each data item.

A34

#OR -- outcome rates

-- year	course code	male, female, or each	promotion rate	repetition rate	dropout rate	graduation rate	transfer rate

-- change the base year from 1986 to 1988

-- the data item will look like the following:

1988	grd1	m	71%	18%	11%	0%	0%
1988	grd2	m	80%	10%	10%	0%	0%
1988	grd3	m	72%	17%	11%	0%	0%
1988	grd4	m	77%	13%	10%	0%	0%
1988	grd5	m	81%	9%	10%	0%	0%
1988	grd6	m	70%	5%	6%	19%	0%
1988	gen7	m	80%	10%	10%	0%	0%
1988	gen8	m	90%	5%	5%	0%	0%
1988	gen9	m	82%	8%	5%	5%	0%
1988	ptti7	m	80%	10%	10%	0%	0%
1988	ptti8	m	90%	5%	5%	0%	0%
1988	ptti9	m	85%	8%	7%	0%	0%
1988	ptti10	m	85%	8%	7%	0%	0%
1988	ptti11	m	0%	8%	7%	85%	0%
1988	vtc7	m	82%	8%	10%	0%	0%
1988	vtc8	m	0%	1%	6%	93%	0%
1988	gen10	m	65%	8%	27%	0%	0%
1988	art11	m	82%	6%	12%	0%	0%
1988	art12	m	45%	5%	1%	49%	0%
1991	art12	m	10%	5%	1%	84%	0%
1996	art12	m	8%	5%	1%	86%	0%
1988	sci11	m	82%	10%	8%	0%	0%
1988	sci12	m	70%	8%	2%	20%	0%
1991	sci12	m	20%	8%	2%	70%	0%
1996	sci12	m	18%	8%	2%	72%	0%
1988	uptt10	m	85%	10%	5%	0%	0%
1988	uptt11	m	85%	10%	5%	0%	0%
1988	uptt12	m	0%	10%	5%	85%	0%

AHD

1988	isla10	m	91%	4%	5%	0%	0%
1988	isla11	m	87%	2%	11%	0%	0%
1988	isla12	m	74%	1%	5%	20%	0%
1988	issci11	m	86%	3%	11%	0%	0%
1988	issci12	m	50%	8%	8%	34%	0%
1988	agri10	m	83%	15%	2%	0%	0%
1988	agri11	m	77%	14%	9%	0%	0%
1988	agri12	m	0%	5%	5%	90%	0%
1988	comm10	m	95%	3%	2%	0%	0%
1988	comm11	m	95%	3%	2%	0%	0%
1988	comm12	m	0%	5%	5%	90%	0%
1988	intec10	m	82%	13%	5%	0%	0%
1988	intec11	m	95%	3%	2%	0%	0%
1988	intec12	m	0%	3%	2%	95%	0%
1988	sptt13	m	85%	10%	5%	0%	0%
1988	sptt14	m	0%	10%	5%	85%	0%
1988	ptech13	m	80%	10%	10%	0%	0%
1988	ptech14	m	0%	5%	5%	90%	0%
1988	med13	m	80%	10%	10%	0%	0%
1988	med14	m	95%	2%	3%	0%	0%
1988	med15	m	95%	2%	3%	0%	0%
1988	med16	m	95%	2%	3%	0%	0%
1988	med17	m	95%	2%	3%	0%	0%
1988	med18	m	0%	2%	3%	95%	0%
1988	eng13	m	70%	10%	20%	0%	0%
1988	eng14	m	96%	0%	4%	0%	0%
1988	eng15	m	96%	0%	4%	0%	0%
1988	eng16	m	0%	0%	4%	96%	0%
1988	sci13	m	65%	10%	25%	0%	0%
1988	sci14	m	92%	4%	4%	0%	0%
1988	sci15	m	92%	4%	4%	0%	0%
1988	sci16	m	0%	4%	4%	92%	0%
1988	agri13	m	70%	10%	20%	0%	0%
1988	agri14	m	95%	0%	5%	0%	0%
1988	agri15	m	95%	0%	5%	0%	0%
1988	agri16	m	0%	0%	5%	95%	0%

AH1

1988	lib13	m	80%	10%	10%	0%	0%
1988	lib14	m	90%	5%	5%	0%	0%
1988	lib15	m	90%	5%	5%	0%	0%
1988	lib16	m	0%	5%	5%	90%	0%
1988	busec13	m	90%	5%	5%	0%	0%
1988	busec14	m	90%	5%	5%	0%	0%
1988	busec15	m	90%	5%	5%	0%	0%
1988	busec16	m	0%	5%	5%	90%	0%
1988	lawsh13	m	65%	10%	25%	0%	0%
1988	lawsh14	m	90%	5%	5%	0%	0%
1988	lawsh15	m	90%	5%	5%	0%	0%
1988	lawsh16	m	0%	5%	5%	90%	0%
1988	edu13	m	75%	10%	15%	0%	0%
1988	edu14	m	90%	5%	5%	0%	0%
1988	edu15	m	90%	5%	5%	0%	0%
1988	edu16	m	0%	5%	5%	90%	0%
1988	grd1	f	85%	8%	7%	0%	0%
1988	grd2	f	71%	6%	23%	0%	0%
1988	grd3	f	80%	12%	8%	0%	0%
1988	grd4	f	72%	7%	21%	0%	0%
1988	grd5	f	77%	4%	19%	0%	0%
1988	grd6	f	60%	5%	14%	21%	0%
1988	gen7	f	78%	12%	10%	0%	0%
1988	gen8	f	89%	5%	6%	0%	0%
1988	gen9	f	70%	15%	10%	5%	0%
1988	ptti7	f	80%	10%	10%	0%	0%
1988	ptti8	f	90%	5%	5%	0%	0%
1988	ptti9	f	85%	8%	7%	0%	0%
1988	ptti10	f	85%	8%	7%	0%	0%
1988	ptti11	f	0%	8%	7%	85%	0%
1988	gen10	f	90%	5%	5%	0%	0%
1988	art11	f	85%	2%	13%	0%	0%
1988	art12	f	45%	2%	1%	52%	0%
1991	art12	f	20%	5%	1%	74%	0%
1996	art12	f	14%	5%	1%	80%	0%
1988	sci11	f	93%	4%	3%	0%	0%

AH8

1988	sci12	f	66%	6%	6%	22%	0%
1991	sci12	f	27%	8%	2%	63%	0%
1996	sci12	f	24%	8%	2%	66%	0%
1988	uptt10	f	85%	10%	5%	0%	0%
1988	uptt11	f	85%	10%	5%	0%	0%
1988	uptt12	f	0%	10%	5%	85%	0%
1988	comm10	f	95%	3%	2%	0%	0%
1988	comm11	f	95%	3%	2%	0%	0%
1988	comm12	f	0%	3%	2%	95%	0%
1988	sptt13	f	85%	10%	5%	0%	0%
1988	sptt14	f	0%	10%	5%	85%	0%
1988	med13	f	95%	0%	5%	0%	0%
1988	med14	f	95%	0%	5%	0%	0%
1988	med15	f	95%	0%	5%	0%	0%
1988	med16	f	95%	0%	5%	0%	0%
1988	med17	f	95%	0%	5%	0%	0%
1988	med18	f	0%	0%	5%	95%	0%
1988	eng13	f	70%	10%	20%	0%	0%
1988	eng14	f	96%	0%	4%	0%	0%
1988	eng15	f	96%	0%	4%	0%	0%
1988	eng16	f	0%	0%	4%	96%	0%
1988	sci13	f	43%	0%	57%	0%	0%
1988	sci14	f	92%	0%	8%	0%	0%
1988	sci15	f	92%	0%	8%	0%	0%
1988	sci16	f	0%	0%	8%	92%	0%
1988	agri13	f	70%	10%	20%	0%	0%
1988	agri14	f	95%	0%	5%	0%	0%
1988	agri15	f	95%	0%	5%	0%	0%
1988	agri16	f	0%	0%	5%	95%	0%
1988	lib13	f	80%	10%	10%	0%	0%
1988	lib14	f	90%	5%	5%	0%	0%
1988	lib15	f	90%	5%	5%	0%	0%
1988	lib16	f	0%	5%	5%	90%	0%
1988	busec13	f	90%	5%	5%	0%	0%
1988	busec14	f	90%	5%	5%	0%	0%
1988	busec15	f	90%	5%	5%	0%	0%

1988	busec16	f	0%	5%	5%	90%	0%
1988	lawsh13	f	65%	10%	25%	0%	0%
1988	lawsh14	f	90%	5%	5%	0%	0%
1988	lawsh15	f	90%	5%	5%	0%	0%
1988	lawsh16	f	0%	5%	5%	90%	0%
1988	edu13	f	75%	10%	15%	0%	0%
1988	edu14	f	90%	5%	5%	0%	0%
1988	edu15	f	90%	5%	5%	0%	0%
1988	edu16	f	0%	5%	5%	90%	0%

#PC -- promotion courses
-- source promotion
-- course course
-- code codes

-- no change in here

grd1	grd2						
grd2	grd3						
grd3	grd4						
grd4	grd5						
grd5	grd6						
grd6	gen7	ptti7	vtc7				
gen7	gen8						
gen8	gen9						
ptti7	ptti8						
ptti8	ptti9						
ptti9	ptti10						
ptti10	ptti11						
vtc7	vtc8						
gen9	gen10	uptt10	isla10	agri10	comm10	intec10	
gen10	art11	sci11					
art11	art12						
art12	sptt13	lib13	busec13	lawsh13	edu13		
sci11	sci12						

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sci12 ptech13 med13 eng13 sci13 agri13 sptt13 lib13 busec13 lawsh13 edu13
uptt10 uptt11
uptt11 uptt12
isla10 isla11 issci11
isla11 isla12
isla12 lib13 busec13 lawsh13 edu13
issci11 issci12
issci12 med13 eng13 sci13 agri13 lib13 busec13 lawsh13 edu13
agri10 agri11
agri11 agri12
comm10 comm11
comm11 comm12
intec10 intec11
intec11 intec12
sptt13 sptt14
ptech13 ptech14
med13 med14
med14 med15
med15 med16
med16 med17
med17 med18
eng13 eng14
eng14 eng15
eng15 eng16
sci13 sci14
sci14 sci15
sci15 sci16
agri13 agri14
agri14 agri15
agri15 agri16
lib13 lib14
lib14 lib15
lib15 lib16
busec13 busec14
busec14 busec15

busec15 busec16
lawsh13 lawsh14
lawsh14 lawsh15
lawsh15 lawsh16
edu13 edu14
edu14 edu15
edu15 edu16

#PSR -- promotion splitting rates
-- source male, promotion
-- course female, splitting
-- year code or each rates

-- change in here the base year from 1986 to **1988**

#TC -- transfer courses
-- source transfer
-- course course
-- code codes

#TSR -- transfer splitting rates
-- source male, transfer
-- course female, splitting
-- year code or each rates

1146

#ENT -- entrants

```
--                                  male,   number
--              course  entrant     female, of
--      year    code    age         or each entrants
```

-- change the first projection year 1987 to **1989**
-- the data item will look like the following:

1989	**grd1**	**6**	**m**	**185585**
1996	**grd1**	**6**	**m**	**267000**
1989	**grd1**	**6**	**f**	**75000**
1996	**grd1**	**6**	**f**	**134000**

#NES -- persons not entering school

```
--                      male,   number
--                      female, not
--      year    age     or each entering
```

-- change the base year from 1986 to **1988**
-- the data item will look like the following:

1988	**6**	**m**	**20000**
1996	**6**	**m**	**0**
1988	**6**	**f**	**90000**
1996	**6**	**f**	**0**

#ENR -- enrollments

```
--                                  male,
--              course   student    female,      number
--      year    code     age        or each      enrolled
```

-- change the base year from 1986 to 1988
-- change also the numbers for 1988 already provided
-- the data item will look like the following:

1988	grd1	6	m	232482
1988	grd2	7	m	169140
1988	grd3	8	m	139993
1988	grd4	9	m	121912
1988	grd5	10	m	98168
1988	grd6	11	m	81516
1988	gen7	12	m	59029
1988	gen8	13	m	56884
1988	gen9	14	m	47307
1988	ptti7	12	m	2477
1988	ptti8	13	m	2298
1988	ptti9	14	m	1421
1988	ptti10	15	m	2025
1988	ptti11	16	m	1282
1988	vtc7	12	m	605
1988	vtc8	13	m	573
1988	gen10	15	m	27717
1988	art11	16	m	6502
1988	art12	17	m	4382
1988	sci11	16	m	8189
1988	sci12	17	m	5288
1988	uptt10	15	m	400
1988	uptt11	16	m	350
1988	uptt12	17	m	250
1988	isla10	15	m	120
1988	isla11	16	m	61

1988	isla12	17	m	87
1988	issci11	16	m	59
1988	issci12	17	m	48
1988	agri10	15	m	130
1988	agri11	16	m	100
1988	agri12	17	m	72
1988	comm10	15	m	250
1988	comm11	16	m	225
1988	comm12	17	m	143
1988	intec10	15	m	371
1988	intec11	16	m	250
1988	intec12	17	m	150
1988	sptt13	18	m	0
1988	sptt14	19	m	0
1988	ptech13	18	m	0
1988	ptech14	19	m	0
1988	med13	18	m	250
1988	med14	19	m	150
1988	med15	20	m	14
1988	med16	21	m	14
1988	med17	22	m	0
1988	med18	23	m	0
1988	eng13	18	m	129
1988	eng14	19	m	102
1988	eng15	20	m	102
1988	eng16	21	m	102
1988	sci13	18	m	161
1988	sci14	19	m	39
1988	sci15	20	m	36
1988	sci16	21	m	35
1988	agri13	18	m	136
1988	agri14	19	m	25
1988	agri15	20	m	25
1988	agri16	21	m	21
1988	lib13	18	m	589
1988	lib14	19	m	267

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1988	lib15	20	m	211
1988	lib16	21	m	95
1988	busec13	18	m	1662
1988	busec14	19	m	635
1988	busec15	20	m	494
1988	busec16	21	m	309
1988	lawsh13	18	m	1656
1988	lawsh14	19	m	1209
1988	lawsh15	20	m	1008
1988	lawsh16	21	m	632
1988	edu13	18	m	904
1988	edu14	19	m	266
1988	edu15	20	m	225
1988	edu16	21	m	109
1988	grd1	6	f	64597
1988	grd2	7	f	49236
1988	grd3	8	f	39629
1988	grd4	9	f	25647
1988	grd5	10	f	18036
1988	grd6	11	f	13723
1988	gen7	12	f	7479
1988	gen8	13	f	3985
1988	gen9	14	f	3215
1988	ptti7	12	f	720
1988	ptti8	13	f	700
1988	ptti9	14	f	680
1988	ptti10	15	f	650
1988	ptti11	16	f	717
1988	gen10	15	f	1923
1988	art11	16	f	427
1988	art12	17	f	338
1988	sci11	16	f	821
1988	sci12	17	f	719
1988	uptt10	15	f	300
1988	uptt11	16	f	200
1988	uptt12	17	f	239

1988	comm10	15	f	71
1988	comm11	16	f	46
1988	comm12	17	f	46
1988	sptt13	18	f	0
1988	sptt14	19	f	0
1988	med13	18	f	70
1988	med14	19	f	21
1988	med15	20	f	17
1988	med16	21	f	5
1988	med17	22	f	0
1988	med18	23	f	0
1988	eng13	18	f	19
1988	eng14	19	f	5
1988	eng15	20	f	0
1988	eng16	21	f	0
1988	sci13	18	f	42
1988	sci14	19	f	15
1988	sci15	20	f	16
1988	sci16	21	f	13
1988	agri13	18	f	4
1988	agri14	19	f	1
1988	agri15	20	f	0
1988	agri16	21	f	0
1988	lib13	18	f	205
1988	lib14	19	f	102
1988	lib15	20	f	57
1988	lib16	21	f	32
1988	busec13	18	f	194
1988	busec14	19	f	73
1988	busec15	20	f	59
1988	busec16	21	f	44
1988	lawsh13	18	f	44
1988	lawsh14	19	f	29
1988	lawsh15	20	f	17
1988	lawsh16	21	f	17
1988	edu13	18	f	295

1988	**edu14**	**19**	**f**	**96**
1988	**edu15**	**20**	**f**	**48**
1988	**edu16**	**21**	**f**	**23**

-- end of data --

4 - Save the file after the changes by using the Norton Editor as follows:

press: **F3**

then push: **E**

5 - Make an edit to the file by giving the following command:

medit exer14 -dmr nofile -dma nofile

If the results of the edit has errors look at the errors in the file exer14.oe by using the Norton Editor by giving the following command:

ne exer14.oe

Correct the errors in the input data file exer14.des and exit with save by pressing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

6 - When you have no errors, do the simulation (i.e., projection) for six years by using the following command:

msim exer14 1986 6 -yes esm

If the results of the simulation has errors look at the errors in the file exer14.os by using the Norton Editor by giving the following command:

ne exer14.os

Correct the errors in the input data file exer14.des and exit with save by pushing:

F3 and then **E**

Continue to do these steps each time you have errors until you have zero errors.

7 - When you have no errors in the simulation, produce table enrollment by level and year (ECLY) for the years 1988 - 1993 by giving the following command:

mreport exer14 ecly 1988-1993

8 - Look at the ECLY table using the Norton Editor by giving the following command:

ne exer14.or

9 - Exit from the Norton Editor by pressing:

F3 and **E**

10 - Copy your input data file and your report on a disk by following these steps:

- Put a disk in the A drive
- Give the following commands:

copy exer14.des a: < >

copy exer14.or a: < >

Then see the two files you just copied on the disk in a: drive by giving the following command:

dir a:

11 - Check your work by comparing the ECLY table you produced with the following ECLY table, if you have the same figures then your work is correct.

Enrollment Summary by Course Level and Year for 1988-1993 (ECLY)

		Year					
Course Level		1988	1989	1990	1991	1992	1993
elem	male	843211	871462	904880	941945	988511	1035217
	female	210868	245002	279863	315477	350286	387489
	total	1054079	1116464	1184743	1257422	1338797	1422706
inter	male	173901	176282	172857	177402	179201	185451
	female	18146	21800	25154	27327	31248	34870
	total	192047	198082	198011	204728	210449	220321
sec	male	55144	75183	95208	104341	107007	106078
	female	5130	5910	7126	9150	11634	13936
	total	60274	81093	102334	113491	118641	120015
psec	male	0	0	237	642	734	711
	female	0	0	14	42	52	53
	total	0	0	251	684	786	764
univart	male	10271	12924	14557	15119	13648	12462
	female	1335	1600	1753	1835	1591	1507
	total	11606	14524	16310	16954	15239	13969
univsci	male	1341	2161	2913	3506	3731	3800
	female	228	320	389	428	424	436
	total	1569	2481	3302	3924	4155	4236

Data and Primary Sources Required by The Manpower Requirements Model and Education Simulation Model

DATA AND ASSUMPTIONS REQUIRED AND THEIR PRIMARY SOURCES IN MRM AND ESM

I- Manpower Requirements Model (MRM)

Data Required	Primary Sources	Definitions and Assumptions
		DESC data description
		TITLE report title
		UNITS units of output
		SEC economic sectors
		OCC occupation groups
OUT sector output in base year	national accounts	OUT sector output growth rates in projection years
EMP sector employment in base year	employment statistics	
EDF employment distr. fractions in base year	employment statistics	EDF employment distr. fractions in projection years (optional)

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II- Education Simulation Model (ESM)

Data Required	Primary Sources	Definitions and Assumptions
		DESC data description
		TITLE report title
		AGE maximum and minimum student age in system
		TG teacher groups
		CL course level
		COR courses by age/sex/ grade/level
EC enrollment capacities in base year (optional)	education statistics	EC enrollment capacities in projection years (optional)
CPS cost per student in base year (optional)	education statistics	CPS cost per student in projection years (optional)
STR student/teach ratio in base year year (optional)	education statistics	STR student/teach ratio in projection years (optional)
OR outcome rates in base year	education statistics	OR outcome rates in projection years
		PC promotion courses

		PSR promotion splitting rates in base year, and optional in projection years
TC transfer courses in base year (optional)	education statistics	TC transfer courses in projection years (optional)
TSR transfer splitting rates in base year (optional)	education statistics	TSR transfer splitting rates in projection years (optional)
ENT entrants to grade 1 primary in base year	demographic and educ statistics	ENT entrants to grade 1 primary in projection years
NES not entering grade 1primary in base year	demographic and educ statistics	NES not entering grade1 primary in projection years
ENR enrollment in every course in base year	education statistics	

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HUMAN RESOURCE PLANNING PRIMARY DATA AND SOURCES

Coverage of Information	Major Details of Information	Usual Source of Information	Uses in Manpower Planning
Population	sex, age, area, education, eco status, occupation, industry, nationality, etc.	population census	bench-mark data on manpower supply and utilization, reference data for future population projection
Labor Force	sex, age-groups, area, education, nationality, etc.	labor force surveys	reference data on current manpower
Employment	sex, age-groups, area, education, status, occupation, nationality, etc.	establishment surveys	data on current labor market
Unemployment	sex, age-groups, area, education, experience, nationality, duration causes mobility, etc.	labor statistics, special surveys	data on surplus manpower
Vital Statistics	birth & death registrations, life expectancy, mortality.	health statistics	data to base replacement estimates

Education enrollment and output	sex,age,stage area courses of study,duration, nationality, efficiency rates, etc.	education statistics	manpower supply projection
Private sector employees	sex, age-groups, area, education, status, occupation, industry, nationality, etc.	labor statistics	current manpower in private sector
Government employees	sex, age, education, position, title, salary, nationality, etc.	personal/civil service statistics	current manpower in govt. sector
Economic information	gross national product, budget, trade statistics, investments, etc.	economic and commercial statistics	data to relate manpower economic parameters for future demand projection
Industrial and occupational classification	standardized defin., concepts, groupings, etc.	statistical or any other office labor department	basis for analysis, report and comparison of manpower information

Reference Section for the Manpower and Education Model

Introduction

This section is prepared as a quick reference for basic operation of the Manpower and Education Model (MEM). It consists of descriptions of the data, definitions, and assumptions required by the three sub-models of the MEM. The inputs of the Manpower Requirement Model (MRM), Education Simulation Model (ESM), and Manpower Allocation Model (MAM) are listed in the same order as the three sub-models. A brief description of the data and assumptions regarding these inputs is also included along with identifying whether they are required or optional. Some of the inputs are optional in the ESM when included in the MRM and others are optional in the MAM when included in either MRM or ESM. Even within a sub-model some optional data become required when other optional items are used. The Program Reference Manual (vol.IV) of the MEM documentation contains more details on the input data, assumptions, and definitions.

I. MRM: Manpower Requirement Model Input

Title	Type of data and assuption	Opt/Req
DESC	data description	required
TITLE	report title	required
UNITS	units of output in national currency	required
SEC	economic sectors: defining the economic sectors of the study	required
OCC	occupation groups: defining groups of occupations	required
OUT	sectoral output data needed: 1-base year output by sectors 2-growth rates of sectoral output in production years	required
EMP	sectoral employment: data needed: base year employment of nationals by sectors	required

PRD	labor productivity:	required
	data needed:	
	growth rates of sectoral productivity for projection years	
EDF	employment distribution fractions:	required
	data needed:	
	percentage distribution of occupation groups within each sector for the base year	

II. ESM: Education Simulation Model

DESC	data description	required
TITLE	report title	optional
AGE	age range: data needed: 1-minimum age: the lowest age in the Educational and Training System (ETS) 2-maximum age: the highest age in the ETS	required
TG	teacher groups: defining groups of teachers and their codes	required
CL	course levels: defining the levels of the ETS and their codes	required

COR	courses: defining the structure of ETS system by listing: 1-courses (by their codes) of all ETS 2-ideal age of each course 3-number of ages in each course (age range covered) 4-identify the sex of each course (male or female) 5-identify whether the course is terminal or not (yes or no) 6-identify teacher groups corresponding to each course 7-list the course title that matches its code mentioned in one above	required
EC	enrollment capacities: constraints on ETS capacities	optional
CPS	cost per student: cost per student is estimated for each course year.	
STR	student teacher ratio: estimating student per teacher for every course and year.	optional

OR	outcome rates: include rates of promotions, repetition, dropout, graduation and transfer: data required: 1-rates of promotion, repetition and dropout for every course (grade and sex) of ETS in base year. Different rates can be used for projection years 2-flow of students between different levels of ETS (from terminal courses to other courses). Such data are necessary for estimating the graduate rate; i.e., the ratio of students who exit ETS from terminal courses. 3-information on student transfers among grades and levels to calculate the transfer rate	required
PC	promotion courses: defining the flow of students from lower to higher grades and levels of ETS; i.e., identifying for every course the next level course or courses students will be promoted to	required

PSR	promotion splitting rates: data required: some data mentioned in OR number (2): historical data on number of students promoted from terminal courses and admitted in the next course or courses of ETS. Promotion splitting rates can be estimated on historical data and present policies of students admission	required
TC	transfer courses: identifying the courses students transfer from and those courses students transfer to	required
TSR	transfer splitting rates: estimating transfer rates among the transfer courses	required
ENT	entrants: data required: number of students entering the ETS (first grade) at the entering age by sex. This information is required for the base year and all projection years	required

NES	persons not entering school: data required: number of children not entering the ETS by age and sex	optional
ENR	enrollment: data required: number of students by grade and sex in all levels of the ETS and by age for students whose ages below the minimum working age. These data are needed for the base year.	required

III. MAM: Manpower Allocation Model

DESC	data description	required
TITLE	report title	optional
UNITS	units of output	optional
AGE	age range: minimum and maximum age in the simulation	optional
MWA	minimum working age: defining the minimum working age in the study	required
WP	waiting periods in time filters: defining: 1-maximum number of years school leavers wait before entering the labor market (a form of unemployment for nationals) 2-maximum number of years that leaking workers wait before reentering the labor market 3-maximum number of years that out-migrants (national workers leaving abroad) wait before returning and reentering in the labor market	optional

COR	courses: defining the courses: their codes and titles, ideal age and number of ages by sex	optional
NAT	nationalities: defining the nationalists of the expatriate workers	required
SEC	economic sectors	optional
OCC	occupation groups	optional
POOL	labor pools: defining labor pools: identifying their codes and titles. Labor pools are the links between school leavers and the sector occupation matrix (SOM)	required
TO	target sectoral output: can be used to: 1-override sectoral output computed by MRM 2-when MRM is not used	optional

TMR	target manpower requirements: can be used to: 1-override sectoral manpower requirements computed by MRM 2-when MRM is not used	optional
IUSL	initial underage school leavers: data required: school leavers who are under working age need to be calculated for the base year to specify the stock of manpower in that year. Leavers should be specified by grade, type (dropouts or graduates), age, and sex	required
IWSL	initial working age school leavers: data required: school leavers who are in working ages need to be calculated for the base year. Leavers should be specified by grade, type (dropouts or graduates), age, and sex	required
NSL	new school leavers: students who left school at the end of the previous year by course, leaver status, age, and sex	optional

AWSL	additional working-age school leavers: additional school leavers who are in working ages can be input for any number of years after the base year	optional
CUP	initial unschooled persons: data required number of persons who are not in school for the base year by age and sex. (Number of persons in a specific age: number of schooled + number of unschooled)	required
NES	persons not entering school: number of students who are not in school for any number of years, by age and sex. If this data is provided, they will override the corresponding NES data in ESM	optional
UPR	underage labor force participation rate: data required: labor force participation rates for persons who are under the working age by year (at least base year), course, leaver status (dropouts or graduates), age, and sex	required

WPR	working-age labor force participation rate:	required
	data required:	
	labor force participation rates for persons who are in the working ages by year (at least base year), course, leaver status (dropouts or graduates), age, and sex	
UPPR	unschooled persons participation rate:	required
	data required:	
	labor force participation rates for persons who are in working ages and not in school by year (at least base year), course, age, and sex	
SLP	school leaver labor pool assignment:	required
	assigning labor pools for school leavers (dropouts and graduates) of each course	
SLPAR	school leaver labor pool assignment rates:	required
	determining rates at which school leavers enter labor pool by course and year (at least base year)	

SLLR	school leaver lag rates: defining how long school leavers of a given year, pool, and sex wait before entering the labor force	optional
IWWSL	initial waiting working-age school leavers: calculating number of school leavers for the year prior to the base year who are waiting in the pools	optional
UPP	unschooled persons labor pool assignment: like assigning the schooled persons to labor pools, persons not in school have to be assigned to labor pools	required
UPPAR	unschooled persons labor pool assignment rates: rates at which unschooled persons enter labor pools	required
INFL	initial national labor force: data required: national labor force distributed by occupations within each sector for the base year only	required

NFL	national labor force: national labor force by occupation and sector for any year. Such data input will override the computed values for the corresponding years	optional
IELF	initial expatriate labor force: data required: expatriate labor force distributed by occupations within each sector for the base year only	required
ELF	expatriate labor force: expatriate labor force by occupation and sector for any year. Such data input will override the computed values for the corresponding years	optional
NAR	national attrition rates: data required: attrition rates of national workers by sector and occupation for the base year and/or any projection year	required

EAR	expatriate attrition rates: data required: attrition rates of expatriate workers by sector, occupation and nationality for the base year and/or any projection year	required
SOMP	sector occupation mobility paths: defining the labor movement in the sector/occupation matrix; i.e., movement from one occupation to another within one sector, movement from one sector to another within the same occupation, or movement from one occupation to another and from one sector to another	optional
SOMR	sector occupation mobility rates: defining rates of labor transfer within the sectors and occupations and the year of transfer	optional
LP	leaker labor pool assignment: defining the pools for the workers who leak from certain occupations and sectors	optional
LR	leaker labor pool assignment rates: determining the rates of leaking workers from the occupations and sectors for a specific year	optional

LLR	leaker lag rates: determining the proportions of the leaking workers by the number of years each segment of the leakers has to wait before reentering the pools. This information has to be given at least for the base year	optional
IWL	initial waiting leakers: determining the workers who leaked out of the pools in the year prior to the base year distributed by their waiting periods (in years)	optional
OMR	outmigration rates: determining rates of outmigrant workers from sectors and occupations and by year. Outmigrants are assigned to their original pools when they return	optional
OMLR	outmigration lag-rates: defining the duration of migration for the outmigrants; i.e., determining the number of years each segment of the returning workers has to wait before entering its original pool	optional

IWO	initial waiting outmigrants: inputting number of outmigrants who have returned before the base year and have been waiting for different periods of time (in years) before entering their pools.	optional
LSP	labor source pools: defining the occupations and sectors for the workers in each pool	required
IPS	initial pools stocks: inputting stocks of workers in the labor pools for the year prior to the base year	optional
CTP	changes to labor pools stocks: inputting any additional stocks of workers for any year of the projection in the pools	optional
AF	allocation fraction: determining the supply of workers allocation methods; i.e., the proportion of those allocated according to the demand (demand driven allocation) and those allocated according to the supply distribution (incidence related allocation)	required

TNF	target nationalization fraction: determining the proportion of nationals targeted in the sectors and occupations for any given year	required
MAP	national manpower allocation priorities: determining the priorities of national workers concentration in sectors and occupations for any given year	required
WIA	expatriate worker importation allowed: determining the allowance or non-allowance of importing expatriate workers in any given year	required

Summary of the Manpower and Education Model and Norton Utilities

SUMMARY OF THE MANPOWER AND EDUCATION MODEL AND NORTON UTILITIES

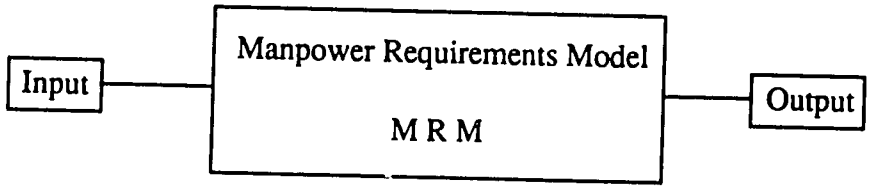
Introduction

The Manpower and Education Model (MEM) is an application running under PC-DOS or MS-DOS. In order to operate the model, the user is required to have knowledge of the Disk Operating System.

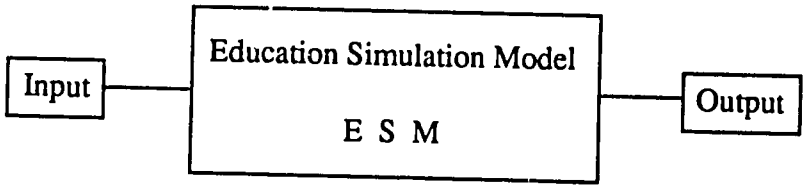
The purpose of this section is to provide the user with a summary of the necessary commands that are used for installing the Norton Editor and the MEM system; or organizing the hard disk and for running the Model (Exercises 1 and 2).

Simplified Schema of the Manpower and Education Model.

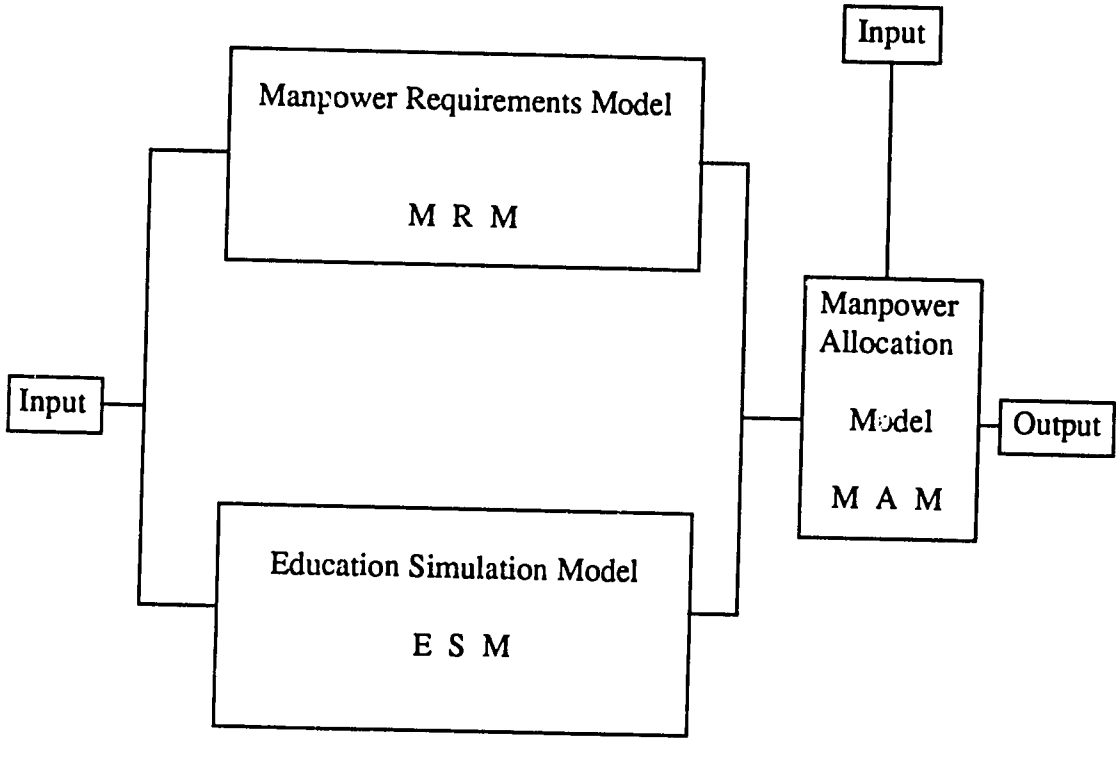
The Manpower Requirements Model



The Education Simulation Model



The Manpower and Education Model



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Overview of the MEM Commands and Files

Commands	File Read (input)	Files Produced (output)	Type
MEDIT simname	simname.DMR (MRM data)	simname.OE (output report)	Ascii
	simname.DES (ESM data) simname.DMA (MAM data)	simname.MED (binary data)	Ascii
MREFORM simname	simname.MED	simname.FMR (new MRM data) simname.FES (new ESM data) simname.FMA (new DMA data) simname.ORF (output report)	Ascii Ascii Ascii Ascii
MLIST simname	simname.MED	simname.OL (output report)	Ascii
MSIM simname	simname.MED	simname.OS (output report)	Ascii
MREPORT simname. MED	simname.OR (output report) simname.MER	Ascii	

The files, having the extensions MED or MER, because they are binary files, cannot be examined by using the Norton Editor. For this reason, the MEM system has provided the user with a special function, called QFILE, which makes it possible to obtain information about the contents of such files.

To examine the file simname.MED or simname.MER, enter the following command:

type: **qfile simname.mer**

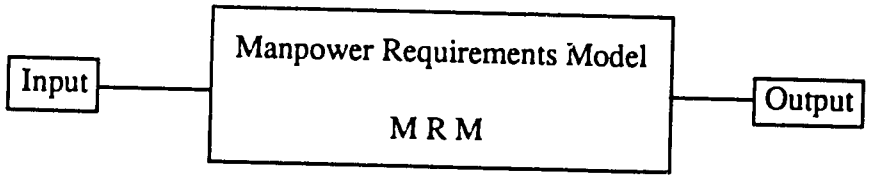
or type: **qfile simname.med**

NOTE: (After using the function MREFORM, the MEM produces files with extension DMR, DES and DMA.) In order to run the MEM programs with the newly produced files, the user has to rename the file extensions by using the DOS command. For example:

ren simname.fmr simname.dmr
ren simname.fes simname.des
rem simname.fma simname.dma .

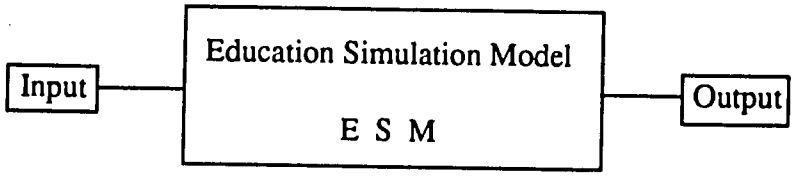
The MEM Commands and Files

The Manpower Requirements Model



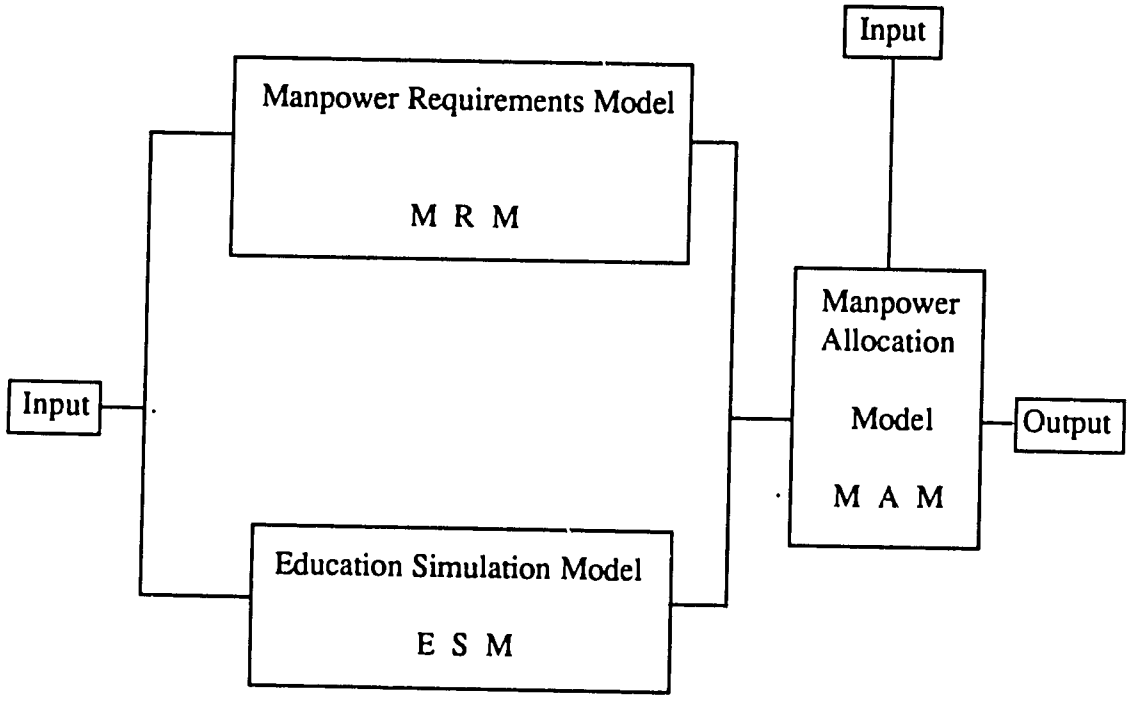
Commands	Files Read (input)	Files Produced (output)	Type
MEDIT simname	simname.DMR (MRM data)	simname.OE (output report)	Ascii
-des nofile		simname.MED (binary data)	Ascii
-dma nofile			
MEDIT simname	simname.DMR (MRM data) simname.DES (ESM data) simname.DMA (MAM data)	simname.OE (output report) simname.MED (binary data)	Ascii
MREFORM simname	simname.MED	simname.OE (output report)	Ascii
		simname.FES (new ESM data)	Ascii
		simname.FMA (new DMA data)	Ascii
		simname.CRF (output report)	Ascii
MLIST simname	simname.MED	simname.OL (output report)	Ascii
MSIM simname	simname.MED	simname.OS (output report)	Ascii
		simname.MER (binary results)	
MREPORT simname	simname.MED	simname.OR (output report)	Ascii
	simname.MER		Ascii

The Education Simulation Model



Commands	Files Read (input)	Files Produced (output)	Type
MEDIT simname -dmr nofile -dma nofile	simname. DES (ESM data)	simname.OE (output report) simname.MED (binary data)	Ascii
MEDIT simname	simname.DMR (MRM data) simname.DES (ESM data) simname.DMA (MAM data)	simname.OE (output report) simname.MED (binary data)	Ascii
MREFORM simname	simname.DED	simname.FMR (new data) simname. FES (new ESM data) simname.FMA (new DMA data)	Ascii Ascii Ascii
MLIST simname	simname. MED	simname.OL (output report)	Ascii
MSIM simname.	simname.MED	simname.OS (output report) simname.MER (binary results)	Ascii
MREPORT simname	simname.MED	simname.OR (output report)	Ascii

The Manpower and Education Model



Commands	Files Read (input)	Files Produced (output)	Type
MEDITsimname	simname. DMR (MRM data) simname.DES (ESM data) simname.DMA (MAM data)	simname.OE simname.MED (binary data)	Ascii
MREFORM simname	simname. MED	simname.FMR (new NRM data) simname.FES (new ESM data) simname.FMA (new MAM data) simname.ORF (output report)	Ascii Ascii Ascii Ascii
MLIST simname	simname.MED	simname.OL (output report)	Ascii
MSIM simname	simname. MED	simname.OS (output report) simname.MER (binary results)	Ascii
MREPORT simname	simname.MED	simname.OR (output report)	Ascii

Running the MEM programs modules

The steps are as follows:

a. Turn the computer on.

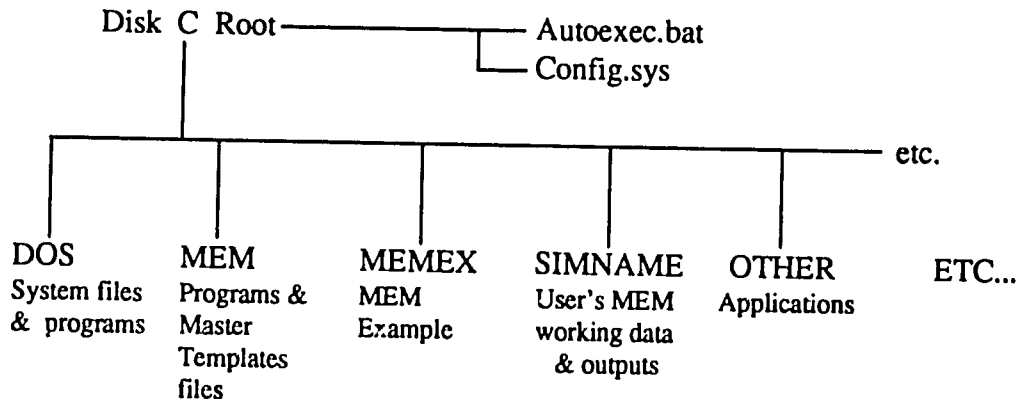
b. At the C:> prompt, move to the MEM subdirectory by entering the command: **cd\memex**

c. Move to the MEMEX subdirectory to display the data file 'example', by typing: **cd\memex**

d. Display the file, by typing: **dir**

DOS and the MEM System

Special attention is given to organize data files using the subdirectory facilities of DOS. While this is not necessary for correct operations. it is, however, recommended for convenience purpose to have a disk arrangement for the MEM system similar to the one shown below:



Subdirectory Description

Root	Contains, among other files, the Autoexec.bat and Config.sys.
DOS	Contains the utilities offered by DOS (copy, delete, format etc...).
MEM	Contains all the MEM program modules.

MEMEX — Contains the example data inputs and outputs and is created during the initial loading phase of the MEM program modules in the system.

SIMNAME — During the production operations of the MEM system, it is recommended to create one or more user's defined subdirectories where contents corresponding to the real data and simulations are mainly contained. For convenience purpose, such subdirectory can be named SIMNAME.

Installing the Norton Editor (NE) on the hard disk.

To install the NE, follow the steps below:

type: **cd**
md norton
cd norton

Insert the system disk in floppy drive A.
type: **copy a:*.***

At the end of the copy process,
type: **cd**

Installing the MEM programs on the hard disk.

The steps for installing MEM are as follows:

a. Turn the computer on.

b. At the C:> prompt, move to the root directory of the hard disk by typing the command: **cd**

c. Insert the MEM System Master A disk in the floppy drive A.

d. Type the command: **a:memstall**

e. When requested by the message displayed on the screen replace the MEM System Master A disk by the MEM system Master B disk. Repeat the operation for the MEM System Master C disk and the MEM Example disk.

Establishing the PATH and the CONFIG.SYS.

The PATH is a command put in the Autoexec.bat file. To determine whether an AUTOEXEC.BAT file exists,

type: **cd**
dir

If no AUTOEXEC.BAT file exist, create one by typing the following steps:

type: **copy con autoexec.bat**
path-c:;c:\dos;c:\norton
F6

If there is an AUTOEXEC.BAT file, then enter the following command:

type: **auto exec.bat**

the system displays.

path-c:;c:\dos;c:norton;...

The subdirectory "mem" has to be added to the existing "Path" instruction. To do so, use the Norton Editor.

At the C> prompt, type:

ne autoexec.bat

Add the subdirectory 'mem' after the last subdirectory of the Path instruction:

Path-c:;c:\dos;c:\norton;c:\mem;

Press **F3** and the **E** to save the new path and end the session.

The CONFIG.SYS is a file used by DOS to allocate the number of files and buffers used by the system. The MEM programs require that the CONFIG.SYS should have:

Files-20 and Buffers-10

If no CONFIG.SYS file exists, create one by typing:

Type: **copy con config.sys**
files-20
buffers-10
F6

If there is a CONFIG.SYS file then check that the value for Files-20 and Buffers-10. If not, use the Norton Editor to correct.

type: **ne config.sys**

Correct the values for files and buffers.
Press F3 and then E to save the new config.sys.

e. After changing the Path and the Config.sys, it is necessary to reboot the system before using the MEM programs.

To do so, press simultaneously the keys **Ctrl**, **Alt** and **Del**.

Command Summary

Here is a summary of the commands the Norton Editor provides:

F1 - Help

F2 - Status

F3 - File commands

- E - *Exit*, save the data and end the edit session
- Q - *Quit*, discard the data and end the edit session
- S - *Save*, write the data to disk and continue editing
- X - *eXchange windows*, switch to other window
- N - *New*, edit a new file
- A - *Append* another file to end of edit data
- W - *Write* part of the data to disk
- L - *Load* more data from a large file
- C - *Close* the output file, open new output

F4 - Block commands

- S - *Set* a block marker
- R - *Remove* block markers
- D - *Delete* a block
- C - *Copy* a block
- W - *Window-to-window* block copy
- M - *Move* a block
- L - *Line*, mark and entire line as a block
- E - *End-of-line* mark to end-of-line as a block
- F - *Find* block marker

F5 - Screen format commands

- L - *Line length*, set line length
- W - *Word-wrap*, toggle on and off
- F - *Format* a paragraph
- T - *Tab*, set tab spacing
- I - *Indent*, toggle auto indent on and off
- C - *Cursor*, set cursor type
- D - *Display*, set display color
- S - *Save* editor with new defaults set
- K - *Key* define, change operation of *Tab* and *Ins* keys

F6 - Miscellaneous commands

- G - *Go to* a line number
- M - *Matching* punctuation, finds matching symbol
- C - *Condensed* display mode
- Ins - *Insert* mode cancel, switch to replace mode
- T - *Test* windows for differences

F7 - Printer commands

- P - *Print* entire edit buffer
- B - *Block*, print marked block
- E - *Eject* paper (form-feed)
- S - *Size* in lines per page
- M - *Margin*, set left margin for printing

F9 - DOS Command Processor

Other commands:

F1 - *Help*
F2 - *Status* display
F9 - *DOS* command processor
Ins - *Insert*, switch to insert mode
^U - *Undelete*
^F - *Find or find-and-replace*
^C - *Continue* find operation
^P - *Insert* control character
^V - *Vice versa*, flip upper and lowercase

Using the Norton Editor

Search Commands

"F" Means Find

The search command in the Norton Editor is "F" for "Find." The direction of the search depends on the character typed before the F.

Alt F — search forward (down)

Ctrl F — search backward (up)

Searching for Upper or Lower Case

Whether the search is or is not "case sensitive" depends on the character typed after the search string. "Case sensitive" means that upper and lower case letters are considered to be different.

After typing the string to be searched for:
press the < > key to search for the exact string, or
press the **Esc** key to make the search case insensitive.

For example, if a character string in the file is ABCdef, a search for abcDEF would be unsuccessful of ended with < >. The string could only be found if ended with Esc.

Continuing a Search

After a search as been made, it can be continued. The command to repeat a search command is "C" for "Continue." The direction in which the search is continued depends on the character typed before the C.

Alt C —continue search forward (down)

Ctrl C — continue search backward (up)

NOTE: An easy way to remember in which direction the Find and continue commands work is that, on a normal PC keyboard, is located above the Alt key. So think of Ctrl as "Up" and Alt as "Down."

The String Recall Command

If you need to reenter a find command you can bring back a previously entered search string by typing **Alt U** when prompted to "Enter String." You can then edit the search string.

Exercise 1

In order to keep the original input data file "example" intact, make a copy for test purpose. Name the input data file "example1."

e. To copy a file: (to a file of a different name)

for the MRM, type:	**copy example.dmr example1.dmr**
for the ESM, type:	**copy example.des example1.des**
for the MAM, type:	**copy example.dma example1.dma**

f. To examine the content of a file (input data) using the Norton Editor:

for the MRM, type:	**ne example1.dmr**
for the ESM, type:	**ne example1.des**
for the MAM, type:	**ne example1.dma**

press F3, press Q Quit, discard the data and end the session
answer YES to the prompt.
See the Norton Editor command summary.

g. After making the printer ready, to Print the input data file of:

the MRM, type:	**print example1.dmr**
the ESM, type:	**print example1.des**
the MAM, type:	**print example1.dma**

NOTE: 'print' is a DOS command.

At this stage, you need to run the MEM program module to verify if all data are copied correctly.

h. To run the MEM Edit program module:

for the MEM, type:	**medit example1**
for the ESM, type:	**medit example1 -dma nofile -dmr nofile**
for the MRM, type:	**medit example1 -dma nofile -des nofile**

After editing, you run the MEM simulation Program by specifying the file name, the base year and the number of projection years.

i. To run the MEM Simulation program module:

for the MEM, type:	**msim example1 1984 5**
for the ESM, type:	**msim example1 1984 5 -yes esm**
for the MRM, type:	**msim example1 1984 5 -yes mrm**

j. Producing the MEM Reports (result of simulation).

To produce all the reports (tables) for the projection years 1985 and 1986.
type: **mreport example1 OSY 1985 1986**

To produce several reports (tables, e.g., MRSO and MROY) for the projection years 1985 to 1987.
type: **mreport example1 MRSO MROY 1984 1985 1986 1987**

k. Examining the data (tables) produced using the Norton Editor.

All the tables produced from the ESM, MAM and MRM is in "example1.or" files and to examine the tables you have already produced.

type: **ne example1.or**

1. To print the produced data (tables) you have just produced.

type: **print example1.or**

Exercise 2

In this exercise, an input data file is modified and the whole process of editing, running the simulation and producing the reports is carried out.

a. To make changes in an input data file, the file must be retrieved.
In order to so do, use the Norton Editor and:
for the ESM, type: **ne example1.des**
for the MAM, type: **ne example1.dma**
for the MRM, type: **ne example1.dmr**

Using the Norton Editor commands to make the changes:
* before making the changes, position the cursor by using the four arrows.
* type the new data over the original data.
* save the new changes by pressing the **F3** key and then **S**.

At this stage, you need to run the MEM edit program module to verify that all changes are correct.

b. To run the MEDIT program module (with the new changes).
After the changes, it is necessary to run this program:
for the ESM, type: **medit example1.des**
for the MRM, type: **medit example1.dmr**
for the MEM, type: **medit example1**

After editing, you need to run the MEM simulation program module.

c. To run the MEM Simulation:
for the ESM, type: **msim example1 1984 5 -yes ESM**
for the MRM, type: **msim example1 1984 5 -yes MRM**
for the MEM, type: **msim example1 1984 5**

d. Producing the MEM Reports (results of simulation).

To produce all the reports (tables) for the projection years 1985 to 1988:
for the ESM, type: **mreport example1 alles 1985-1988**
for the MRM, type: **mreport example1 allmr 1985-1988**
for the MAM, type: **mreport example1 allma 1985-1988**

To produce a specific table (e.g., OSY) for the projection years 1985 and 1986.

type: **mreport example1 OSY 1985 1986**

To produce several reports (tables, e.g., MRSO and MROY) for the projection years 1985 to 1987.

type: **mreport example1 MRSO MROY 1984 985 1986 1987**

e. Examining the produced data (tables) using the Norton Editor.

All the tables produced from the ESM, MAM and MRM is in "example1.or" files and to examine the tables you have already produced.

type: **ne example1.or**

f. To print the produced data (tables) you have just produced.

type: **print example1.or**

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Exercise 3 - Norton Editor

Searching a string of characters

a. Searching Forward:

Enter the command:	**Alt+F**	(remember to press < >)
The system displays:	**Searching Forward, Enter string:**	
Enter the string:	**abcdef**	(press **Esc**)

example: Search for the string #CL in EXAMPLE1.DES

1. Call the file EXAMPLE1.DES To do so, type:

   NE EXAMPLE1.DES **< >**

2. When the logo is displayed, press any key to display

3. Press **Alt+F** keys to invoke the Search command.

4. Enter the search string: **#cl**

5. Press **Esc** key.

Exercise 4 - Norton Editor

Searching Backward:

Enter the command:	**Ctrl+F**	**< >**
The system displays:	Searching Backward, Enter string:	
Enter the string:	**abcdef**	**Esc**

example: Search for the string **#CL** in EXAMPLE1.DES

1. Call the file EXAMPLE1.DES To do so, type:
   NE EXAMPLE1.DES **< >**

2. When the logo is displayed, press any key to display and press **Pg Dn** three times

3. Press **Ctrl+F** keys to invoke the Search command.

4. Enter the search string: **#cl**

5. Press **Esc** key.

Exercise 5 - Norton Editor

Searching and replacing a string of characters

Searching and Replacing: Forward

Enter the command: **Alt+F abcdef Alt+F ghiljk** (Press **Esc**)

answer: **Y** (to confirm replacement)

Enter the command: **Alt+F abcdef Alt+F ghijkl Alt+F *** (press **Esc**)

NOTE: with * all strings will be replaced.

example: Search and Replace the string #COR by #abc in EXAMPLE1.DES

1. Retrieve example1.des To do so, type:
   NE EXAMPLE1.DES **< >**
2. When the logo is displayed, press any key to display.
3. Press **Atl+F** keys to invoke the Search command.
4. Enter the search string: **#COR**
5. Press **Alt+F** keys to invoke the Replace command.
6. Enter the replacement string: **#abc**
7. Press **Esc** key.
8. Press **Y** to confirm replacement.

Exercise 6 - Norton Editor

Searching and Replacing: Backward

Enter the command: **Alt+F abcdef Alt+F ghiljk** (Press Esc)

answer: **Y** (to confirm replacement)

Enter the command: **Alt+F abcdef Alt+F ghijkl Alt+F *** (press Esc)

NOTE: with * all strings will be replaced.

example: Search and Replace the string #abc by #COR in EXAMPLE1.DES

1. Retrieve the file EXAMPLE1.DES. To do so, type:

   NE EXAMPLE1.DES **< >**

2. When the logo is displayed, press any key to display and press **Pg Dn** three times.

3. Press **Ctrl+F** keys to invoke the Search command.

4. Enter the search string: **#abc**

5. Press **Ctrl+F** keys to invoke the Replace command.

6. Enter the replacement string: **#COR**

7. Press **Esc** key.

8. Press **Y** to confirm replacement.

Exercise 7 - Norton Editor

Copying a block from one window to another window.

1. Retrieve the first file: **ne example1.dmr** **< >**

2. Press **F3+X.**

   The system displays a window.

3. Retrieve the second file: **example2.dmr** **< >**

4. Press **F3+X.**

   The system cursor moves back to the top window.

5. Set a block marker at the beginning of the text and another block marker at the end of the block to be copied. To do so, position the cursor at the beginning of the block of test and press **F4+S.**

6. Move to the bottom window by pressing **F3+X.**

7. Position the cursor.

8. Press **F4+W.**

9. To quit without saving, press **F3 Q** and **Y**. Repeat to quit the second window.

10. To quit and save, press **F3+E.**