Computer Application Theory

CHAPTER 3

Operating System

INTRODUCTION

A computer system is basically combination of hardware and software. For its functioning it requites different types of hardware devices, electronic components and various types of software. Operating system is one of the software, which computer uses for its internal functioning. What operating system is, what are its functions and what types of operating systems are commonly available for use are the issues that are described in this chapter.

OPERATING SYSTEM BASICS

Operating System is essential software that is required for a computer to become operational. It provides functionality to computer hardware, so that electro-mechanical components of it perform read, write and processing functions as human being do.

Without operating system, computer cannot work. In the absence of operating system, neither input devices will be able to provide data to the computer nor memory will be able to store anything it nor processor will be able to process the data nor output devices will be able to show the result. Managing computer's resources and making them work in coordination with each other is the responsibility of operating system.

Any instruction given by the user to the computer to perform a function is actually carried out by operating system. It is the operating system, which on receiving instructions from the user invokes all internal units to perform their duties and workout the result. Details of operating system are described below.

MAJOR FEATURES OF THE OPERATING SYSTEM

Operating system is essential software, purpose of which is to activate the computer and:

1. Perform internal management functions.
2. Provide services.
3. Provide user interface.

Internal management functions are the functions that have to be essentially performed to make the computer work. Services are bunch of commands and utilities that operating system provides to its users to have better control over computer. User Interface is the methodology, using which user interacts with computer. Block diagram, showing the basic structure of operating system is shown in figure 3.1.

Management Functions Of Operating system

Essential functions that an operating system performs are:

- Process management function
- Memory management functions
- Information management functions
- Device management functions
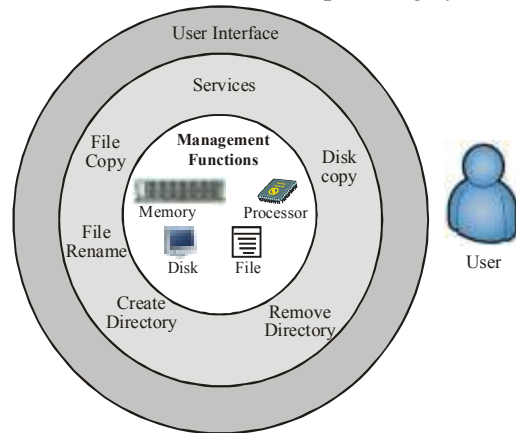
Figure 3.1

What these functions are, where do they fit in data processing cycle, is explained below.

Process Management Functions

Programs that are to be executed and their data, initially reside within computer's memory. For executing them they are taken to the processor, arithmetic and logical operations are performed within the processor, result of processing are transferred back to the memory and processor is set free for performing other tasks.

All these processor related operations are called process management functions. It is quite obvious that these functions cannot be carried out on their own. Some software is required to perform these functions. Operating system is the software, which performs these process management functions.

Memory Management Functions

All the programs that are to be executed and the result that are to be printed, have to be essentially present in memory. When any such item comes to memory, it is accommodate in some free portion of the memory. If there is no free space, swapping procedure is started.

On the other hand, if any item present in memory is no more required then memory is reclaimed and free space is created. All these functions are memory management functions and are performed by operating system.

Information Management Functions

Permanent storage of information within computer is an essential requirement of any computer environment. For this, data / information is written on the secondary storage devices, in well systematic way. In this process, all arrangements are made to ensure that

new data / information being written on the device doesn't overwrite previously written data / information and afterwards it is easily retrievable in its, original form. All those activities, which are carried out in computers for this objective are called information management functions and are carried out by operating system.

Device Management System

Keyboard, monitor, floppy drive, hard disk etc. are few devices that are part of almost every computer. In computers their functionally is partially controlled by hardware and partially controlled by software.

Operating system is the software that controls these devices. For example, when a command is given from the keyboard, keyboard controller card (hardware) converts it into computer readable form and operating system (software) interprets it and executes it. Similarly disk controller card (hardware) places the read / write head of the disk at appropriate place, and operating system performs the writing function.

Services Provided By Operating System

Apart from performing above mentioned management functions, operating system provides many commands and utilities for doing housekeeping tasks. For example, it may provide utility for:

- Listing the names of all files and directories, present on a disk.
- Copying the contents of a file into another.
- Compressing the file and uncompressing the files.
- De-fragmenting the disk.

User Interface

While working on computer, user has to interact with computer. For example, if a program is to be executed, user has to communicate to the computer that this is the program, which is to be executed.

Note that different operating systems provide different ways of interacting with computer. In computer terminology, the method of interaction is often referred to as user interface. User interfaces are basically of two types:

1. Command Line Interface (CLT).
2. Graphical User Interface (GUI).

Details of both the types of interfaces are given below:

Command Line Interface

In command line interface, user interacts with the computer by typing the commands in specified format. Thus he mostly makes use of keyboard to interact with the computer. For example, to copy the contents of data.dat file in data.bak file, he will have to type the command in following format:

COPY [name of file to be copied] [name of file in which contents have to be copied]

Thus he will type the following contents:

COPY data.dat data.bak

Note that in such type of communications, user has to remember the name and format of the commands. Spelling mistakes and deviations in format lead to errors and the task is not performed.

MS-DOS, Unix, Linux etc. are few operating systems, which provide command line interface. Visual appearance of MS-DOS's command line interface is illustrated in figure 3.2.
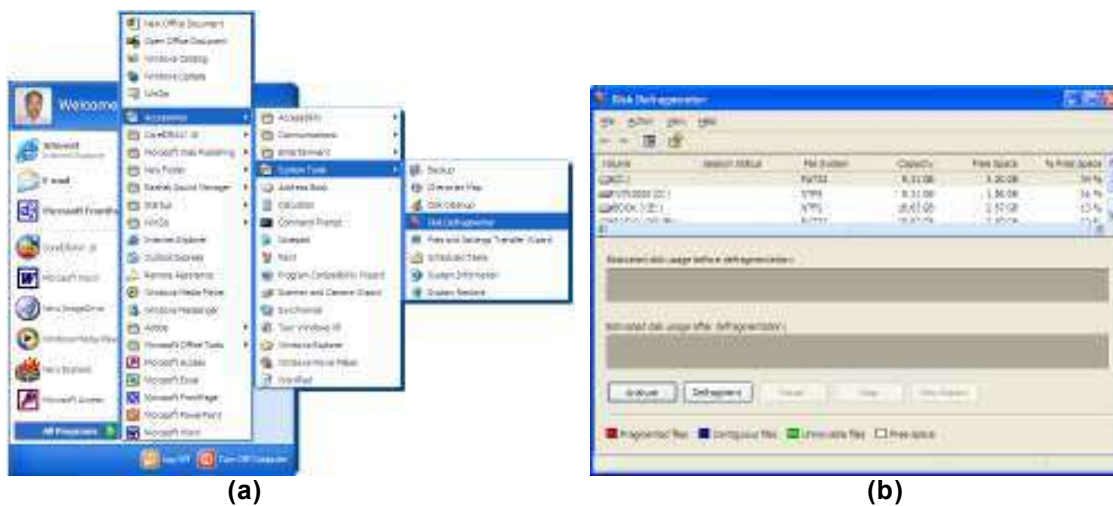

Figure 3.2

Graphical User Interface

In graphical User Interface (GUI), user interacts with the computer through graphical items, such as icons, menus dialog boxes etc. As and when required, these items automatically appear on the monitors and user has to simply select his choice from the displayed items, by clicking the mouse on desired option. Thus in this type of communications, user mostly makes use of mouse to interact with computer.

To understand the concept of GUI, refer, menus shown in figure 3.3(a). To invoke de fragmentation program, user need not remember the command name and command format, as he had to do in command line interface. For this, he simply needs to click the mouse on the corresponding option present in the menu. When he does so, computer interacts with him through GUI objects like submenus, dialog boxes, alert boxes etc., as shown in figure 3.3(b)

Windows, Macintosh operating system, OS/2, some versions of Linux, Unix etc. provide graphical user interface to interact with computer.

(a)   (b)

Figure 3.3

GUI COMPONENTS

Graphical user interface makes use of following GUI components to make the user interaction easy and interesting:

Program Icons

All those icons that represent program are called program icons. Some of the program icons are illustrated in figure 3.4(a). To run the program, you need to double click the mouse on its program icon. For example, to execute Date/Time program, you will have to double click the mouse on its icon.

Objects Icons

All those icons that represent objects like, devices, files, folders etc. are called object icons. Some of the object icons are illustrated below.

Represents Floppy drive.

Represents hard disk.

Represents a folder.

Represents executable file.

Represents non-executable files.

Represents data file.

Menus

Following types of menus appear in GUI. Each menu provides various options. An option is selected by clicking the mouse on the desired option.

1. Popup menu
2. Shortcut menu
3. Bar menu

List Boxes

List boxes display various choices within a box (names, numbers, symbols etc.). An item of choice is selected by clicking the mouse on it. A list boxes is shown in figure 3.4(d).

Drop Down List Box

Drop down list box is another type of list box that looks like a text box with a down

pointing arrow button on its right hand side. When you click the mouse on the arrow, a list of options drops down. To select any option from this list, you need to click the mouse on it. A drop down list is shown in figure 3.4(d).

Check Boxes

Small square shaped buttons (could be one or more) form check boxes. Labels written near the buttons give an indication of the type of data / information that will get selected, when you click the mouse on it. When you select a check box, a mark gets placed within the check box. If you wish, you could select more than one check box from the group. Check boxes are illustrated in figure 3.4(c).

Radio Buttons

Group of at least two or more rounded buttons form radio buttons. Labels written near buttons give an indication of the type of data/information that will get selected when you click the mouse on it. Only one radio button, from the group can be selected. When you select a button, a black dot appears within the selected button. Radio buttons are illustrated in figure 3.4(c).

Spinner

A spinner consists of two arrow buttons and a text box, with some value written into it. One arrow points up and the other points down. When you click the mouse on up arrow, the value in the text box increases. When you click it on down arrow, the value in the text box decreases. A typical spinner is illustrated in figure 3.4(b).

Text box

Text box consists of rectangular blank area, in which contents are typed. A typical text box is illustrated in figure 3.4(d). Note that the label written beside the text box gives the idea of the contents that are to be typed in text box. For example, the label "File name" indicates that the name of the file is to be typed in this text box.

Buttons

Rectangular labels, with some text written on them form buttons. Few buttons are illustrated in figure 3.4(d). When you click the mouse on the button, an action takes place. The text written on the buttons, generally gives an indication of the action, which will take place, when you click the mouse on it. For example, when you click the mouse on "Open" button, the file mentioned in the dialog box gets opened.

Toolbars

A row of small buttons, with icons in them forms a toolbar. Each button perform a specific task when you click the mouse on it. A typical toolbar is illustrated in figure 3.4(a).
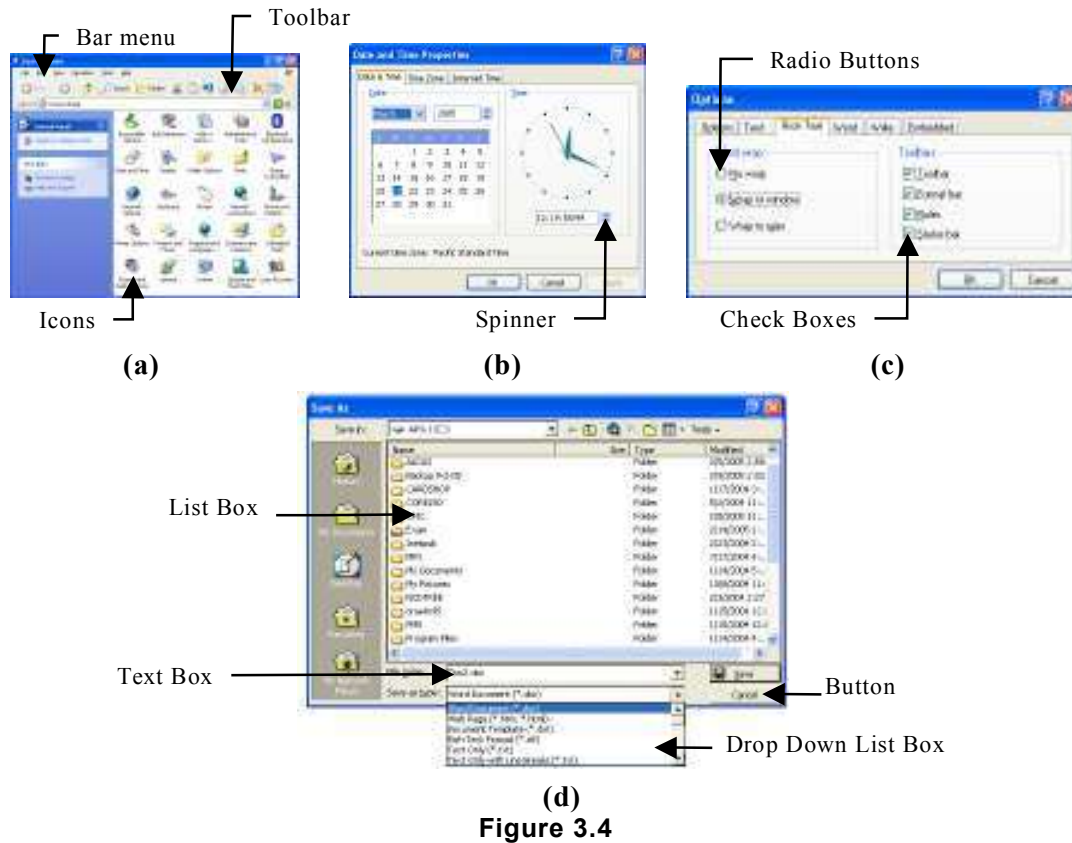
(a)   **(b)**   **(c)**

(d)

Figure 3.4

MOST DESIRABLE CHARACTERISTICS OF OPERATING SYSTEM

As man's popularity and acceptability depends upon his character, operating system's popularity depends upon its characteristics. Following are the most desirable characteristics of operating systems:

Easy-To -Use

Be it any operating system, it is required that its user interface should be user friendly. Process of invoking commands, utilities and applications should be easy.

Few decades back, when devices like modern monitors and consoles were not available, people had to interact with computer through punch cards and tapes. What data is going into computer could neither be seen nor modified on-line. In those times working on computer was really a tough task. Price and unfriendly user interface were the two factors that were against computer's popularity. Introduction of Character User Interface (CUI) made interaction with computer easy to some extent, but with the advent Graphical User Interface (GUI), problem got solved to large extent. It is due to Graphical User Interface

that even a child can operate computer these days. Hand writing recognition, voice recognition systems etc. are now being incorporated in operating systems. They, coupled with other sophisticated modern hardware devices, are adding new dimensions to computer's functionality. For example, operating system of the table PC supports these features.

Reliability

Performance of the operating system should be reliable. Each time it executes a program, it should produce same result with same efficiency.

It should sustain abrupt power failures and shutdowns. It should not so happen that these hazards corrupt user's data or system files. It is required that operating system should be robust in nature and should withstand all odd conditions.

Speed And Efficiency

Response time is one of the prime factors that attributes to the success of any operating system. Response time of any operating system partly depends upon the quality of the hardware and partly upon the efficiency of the algorithms that has been implemented for internal resource management. It is quite obvious that computer with faster CPU, faster memory etc. will produce faster results. Such a hardware managed by efficient operating system will produce still faster throughputs.

Reusability

With wide variety of processors and other hardware computers available these days, it is required that operating system written for one type of computer should be easily portable to other hardware platforms. This saves time, effort and cost. Object oriented approach for programming promotes reusability to a large extent.

Security

Security is the most desirable characteristic of any operating system. An operating system should provide means for safeguarding system resources from unauthorized users and protection of one user's resources from other users of the system.

With the advent of Internet and local area networks getting popular, even single user computers need to interact with other computers these days. Such situations demand tight security features. Popular operating systems offer these features through incorporation of following:

    (i) Login name.

    (ii) Login password.

    (iii)Read, write, access file permissions.

    (iv) Encryption of data.

    (v) Virus protection software layers.

Adaptability

With the advancement in electronics and its focus on miniaturization, wide variety of plug-in devices has suddenly invaded the market. Each device is meant for getting connected to the computer and working in coordination with other devices. In this scenario, it is desired that operating system should be adaptable enough to accommodate these devices easily.

Quite sometime back, it was very difficult to add new devices to the system. Lot of changes and modifications had to be done in system files to make the new device functional. Now the scenario has completely changed. These days operating systems have large database of device drivers built into them. They support plug and play feature. They automatically sense the presence of new device in the system and load corresponding device drive automatically. Operating systems have helpful wizards incorporated in them. In all those events, in which they fall short of any data, software or hardware, wizards is invoked automatically. Wizard guides the user to perform all necessary steps for making the device /system operational.

Compatibility

Data communication and resource sharing are the two prime activities that need to take place in most of the working environments these days. Wide variety of hardware, operating systems, and applications need to interact with each other. So it is highly desirable that operating system should be communication protocol rich so that it is compatible with other operating systems. Files and programs of other computers should be accessible in the same way, as files and programs of local computer remain available.

Most of the operating systems these days are compatible with other operating systems. Effective protocols and software layers have been incorporated in operating system to promote compatibility issue.

It is also desired that Internet connectivity and accessibility issues are inbuilt into operating system. No addition and alterations should be externally required. For example, in the earlier days of Windows-95 operating system, many software and utilities (including internet explore) had to be installed on top of operating system to get connected to Internet and avail its services. But in the later versions like Window-98, Window-XP etc. these services became integral part of the operating system. As soon as operating system is installed on computer, it becomes ready for Internet access.

Multimedia Support

Computer is no more data crunching tool now. It is more like multimedia electronic device. Its usage is no more limited to numbers and words. Graphics, sound, animation, video etc. fall within the preview of its capabilities.

These days it is desired that operating system should support all multimedia features to accommodate wide range of multimedia hardware devices. Multimedia operations like photo editing, sound editing and playing, animation and video effect etc. should be possible on computer.

GUI based operating system of modern times, like Windows, Linux etc. provide strong support for multimedia operations.

You are now familiar with some of the most desired characteristics of operating systems. Characteristics mentioned above are part of most popular operating systems of today. Some of the characteristics that are not part of modern operating system, but are very much required because of change in computing requirement are described below.

MOST DESIRED ADVANCED FEATURES IN MODERN OPERATING SYSTEMS

Networking along with Internet has completely changed computing scenario in modern times. They have turned the globe into global village. Physical location of data, devices and user of an application are no more required to be confined to single geographical location.

For example, a user in India may have to store his data on three different computers that are placed in three different countries (say America, France, and Australia). With such type of requirements taking place, modern operating system should support following features:

(i) Seamless Distributed Computing

(ii) Seamless Distributed Database

(ii) Global User Management

(iv) Universal Environment

(v) Composed Based Operating System.

Seamless Distributed Computing

Seamless distributed computing refers to the feature that if A, B, and C computers are in network and you are sitting on computer B, whenever, you fall short of resources (like CPU time, memory space etc.), operating system should ensure that you are efficiently allocated resources of A and C so that your task is completed effortlessly. This feature of operating system is the demand of the day.

Seamless Distributed File System Database

File systems should allow the user to create cabinets on their computer, in which they set few parameters so that when they use cabinets, files show up there as if they were any other folder. File system should also allow the user to set the scope of the cabinet, local, network or world wide. The physical location of files should be irrelevant. This feature should be part of operating system today.

Global User Management

Operating systems of modern times should have global user management feature built into them, so that when user activates his OS, he should be given a global account where his preferences and other key settings are stored along with the data, which he chooses to store there. In that space, all his e-mails, favorites and other system specific stuff could also be

kept so that all this stuff doesn't become local to the computer, on which he is working today. Tomorrow if he works on other computer, his global stuff should be accessible.

Apart from this, if he is working on other computer, OS should allow him to lift the data from other computer on which he worked previously.

Universal Environment

It is highly desirable that operating system of modern times should support the feature of Universal Environment so that when a user shifts from his computer to public computer, the same working environment (program setting etc.) is provided to him and his programs work well on other computers also.

Component Base Operating System

In the era of open system, it is desired that it should be possible for others to modify the OS code, so that its capabilities and services could be enhanced.

TYPES OF OPERATING SYSTEMS

Various types of operating systems are available for use. For example, MS-DOS, Windows, Linux, Unix etc. are the names, of few popular operating systems.

Although all of them perform above-mentioned management functions but they differ from each other in terms of capabilities, user interface and services that they extend to their users. Operating systems can be broadly classified into following categories:

1. Single user operating systems
2. Multi user operating systems
3. Network operating systems

A detailed description of all the types of operating systems is given below.

## Single User Operating Systems

Figure 3.5

Single user operating systems are those operating systems, which allow only one user to work on the system at a time. In no way, multiple users can work on the system simultaneously. Concept of single user operating system is illustrated in figure 3.5.

Single user operating systems can be broadly categorized into two categories:

1. Single user single task operating systems.
2. Single user multitasking operating systems

Single user single task operating systems allow user to execute one program at a time. For example, if he is preparing a worksheet on computer, he cannot print a report on the printer. As soon as he invokes a program, computer gets dedicated to that task only. CP/M, MS-DOS etc. are few examples of single user single task operating systems.

Single user multitasking operating systems allows user to execute more than one programs at a time. For example, while he is preparing a worksheet on computer, he can print a
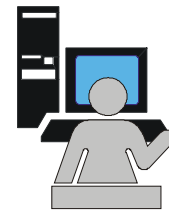
report on the printer and play music too. Practically there is no limit from operating system's side for the number of tasks that can be executed simultaneously. Physical size of the memory (hardware available) puts the limitation. Windows Me, Windows-XP, Macintosh operating system, OS/2 etc are few examples of single user multitasking operating systems.

Multi-User Operating Systems

Multi-User operating systems are larger and more complex operating systems. They allow multiple users to work on the system simultaneously. Concept of multi-user operating system is illustrated in figure 3.6.

Following are the features of multi-user operating systems, which are not provided in single user operating systems.

Figure 3.6

- Time sharing (CPU devotes time to all the users in round robin fashion).
- Tight security features.
- Resource sharing among users.
- System administrator privileges.

Linux, Unix, VMS etc. are few examples of multi-user operating systems.
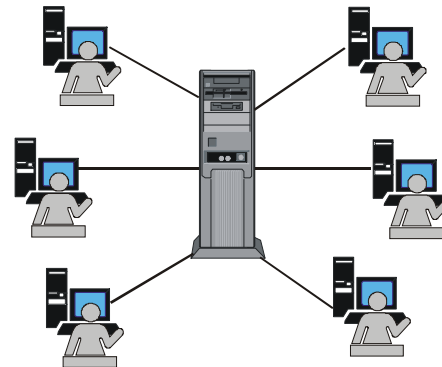
Network Operating System

When two or more computers are connected to each other with the objective of sharing their resources, they form a computer network. A network operating system is an operating system, which includes special functions, protocols and device drivers for connecting the computers of the network. When a computer is booted with network operating system, all computers get connected together and the network becomes operational. When network becomes operational:

- Security features get implemented
- Devices of one computer can be used by other network users.
- Files can be shared among them.
- They can communicate with each other, sending mail and messages.

Windows-NT, Windows-2000 server, Windows server 3000, Novell Netware, IBM AIX, Red Hat Linux etc. are few examples of network operating systems.

PC Operating System - DOS

MS-DOS is one of the most popular, powerful and useful operating system. It was designed and developed in the initial days of Personal Computers (PC) by Microsoft Corporation of USA. Due to its versatility and ease of operations, it became quite popular, within short span of time.

MS-DOS is single user single task character user interface (CUI) based operating system. To execute any command in MS-DOS, you need to know the command and its format. Any mistake in its spelling or format leads to error in command's execution.

MS-DOS not only activates computer resources and controls them but it also provides many commands for performing day-to-day tasks.

Architecture Of MS-DOS

MS-DOS is a modular operating system and comprises of many files. It utilizes these files as and when required. Following files put together constitute MS-DOS operating system.

1. IO.SYS
2. MSDOS.SYS
3. COMMAND.COM
4. Many external command files

Basic architecture of MS-DOS operating system is illustrated in figure 3.7 and role of each file is explained below.

MS-DOS Operating System

IO.SYS
MS-DOS.SYS
COMMAND.COM
External Commands (In the form of Executable File)
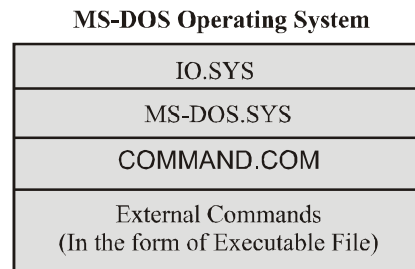
Figure 3.7

IO.SYS File

This is one of the most fundamental files of MS-DOS. It gets loaded into computer's memory at the time of booting the system. It primarily activates basic input and output devices like keyboard, VDU etc. and makes them functional.

MSDOS.SYS File

This file is also one of the fundamental files of MS-DOS. It automatically gets loaded at the time of booting the operating system. It controls internal resources like memory, ALU, Control Unit etc. of computer. When it gets executed, memory, ALU, control unit etc. become functional.

COMMAND.COM File

This is the third fundamental file of MS-DOS operating system. It comprises of few frequently used MS-DOS commands. When you boot the system, it gets automatically loaded into computer's memory. After booting the system, commands contained in it, remain resident in the main memory. This is the reason, why they are also called internal commands or resident commands. For example, DIR, COPY, TYPE, REN etc. are internal commands of MS-DOS and reside in COMMAND.COM file.

To execute an internal command, you need to type the command from the keyboard in its recommended format. When you do so, it is directly read from the memory and executed. Role and function of commonly used internal command are described later in this chapter.

External Commands

MS-DOS comprises of many external commands. Each command exists in the form of executable file and resides on the disk. For example, FORMAT, XCOPY etc. are the

examples of external commands. They exist in the form of FORMAT.COM, XCOPY.EXE files respectively.

To execute an external command, you need to type the name of the command from the keyboard and press Enter key. When you do so, computer reads the file from the disk, loads it into memory and executes it. When its execution is complete, it is removed from the memory. Role and functions of few external commands are described later in this chapter.

File Naming Convention

In MS-DOS, file name comprises of two parts. First part is called primary name and second part is called extension. Both the parts remain separated from each other by a dot. Primary name can be at most 8 characters long and extension can be at most 3 characters long. The name can either be written in upper case or lower case letters but operating system stores all the file names in upper case only. As per rules, mathematical signs like +,-,*,/ etc. can not be used in constituting the file name. Following is the general format on MS-DOS file name:

$$\underline{XXXXXXXX} . \underline{XXX}$$

8 character of primary name ◄─── dot ───► 3 characters of extension.
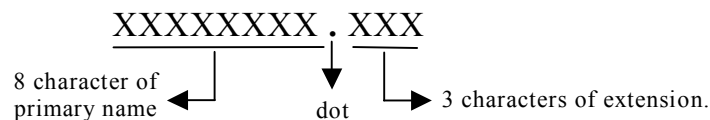
For example, DELL.COM, PLOT.DAT, MONTH12.BAK, YR.AS, RIGHT.DOC etc. are valid file names:

Concept Of Directory

Directory can be conceptualized as special file, which could hold files and directories in it. Concept of directory is illustrated in figure 3.8. Refer this figure and note that D1 is a directory, which holds two files F1 and F2 in it. It also contains a directory D2 in it. D2 holds files F3 and F4 in it.

From this figure, it is quire clear that directories can be utilized for classified storage of files on the disk. For example, directory named LETTER could be utilized for storing all letters in it. Similarly the directory CPROGRAM could be used for storing all the programs written in C language.

Directory-D1

File-F1   File-F2

Directory-D2

File-F3   File-F4
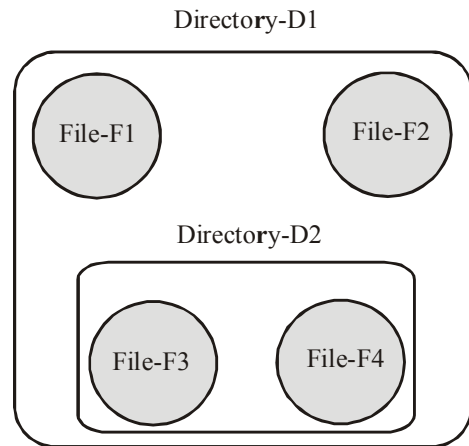
Figure 3.8

Concept Of Root Directory

Root directory can be conceptualized as the top most directory, which holds other directories and files in it.

Whenever you use any disk for the first time, root directory gets automatically created on it. Other files and directories that are created thereafter are created within root directory. In MS-DOS, root directory is denoted by back slash (\) sign.

Concept Of Parent Directory

Parent directory is the directory, in which you create another directory. For example, if directory D2 is created in directory D1 then D1 directory will be called parent directory of D2. Similarly if directory D3 is created in directory D2 then D2 will be the parent directory for D3. Parent directory is denoted by double dot (..) symbol.
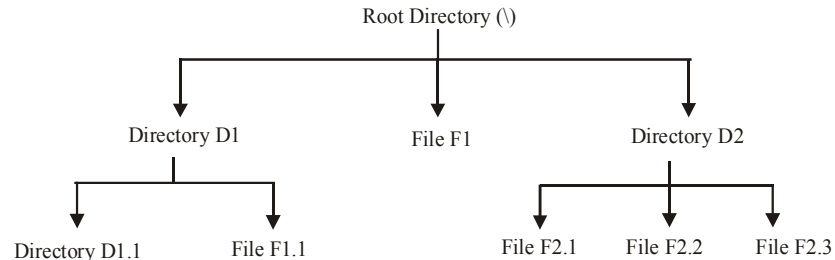
Current Directory

Once you have directories within directory you can always change your position from one directory to another directory. The directory within which you are currently placed is called current directory. For example, if you are currently placed in directory D1 then D1 will be called current directory. When you have moved from directory D1 to D3 then D3 will be the current directory.

MS-DOS File System

The mechanism of arranging the files and directories on the disk is called File System. In MS-DOS, file system looks like an inverted tree. Root directory appears at the top of the tree. Other directories branch off from there and files act as leafs.

Such a file arrangement is often referred to as hierarchical file system. A hierarchical file system consisting of few files and directories is illustrated in figure 3.9.

Note that root directory is at the top of the tree. Root directory contains two directories D1, D2 and a file, named "File F1" in it. D1 and D2 further contain subdirectories and files in them. Note that directories in MS-DOS follow the same naming convention that files do. Generally the directories are assigned a name, which gives an indication of the type of files contained in them. For example, the name DOCUMENT could be used for storing document files in it. Similarly SALARY directory could be used for storing pay related files.

Figure 3.9

Concept Of Path

Path of a file or directory is the list of directory names in descending sequence, starting from root and each directory name separated by a back slash (\), following which you reach to the desired file or directory. For example, refer figure 3.8. The path for file F1.1 will be \D1\F1.1. Similarly the path name for F2.2 file will be \D2\F2.2. Note that first backslash in the path name denotes root directory, while other backslashes serve the purpose of separators.

MS-DOS COMMANDS

Following are few commonly used MS-DOS commands:

DIR Command

DIR command is used for displaying the names of all the files residing on media like floppy hard disk, CD etc. In its simplest form it can be executed in following format:

C:\> DIR [Enter]

This command will display the names of all the files present on C: disk, in the following format:

Volume in drive C is RAMESH
Volume Serial Number is 36F7-808
Directory of C:

COMMAND	**COM**	**54,645**	**06-11-99**	**7:21a**
DATA	**DAT**	**732**	**07-12-99**	**6:20p**
REPORT	**DOC**	**3,210**	**05-05-98**	**5:40p**
DOIT	**BAK**	**734**	**05-06-99**	**2:25a**
TOTAL	**DAT**	**351**	**10-10-99**	**5:25p**
EXAM	**LET**	**357**	**08-08-99**	**6:37p**

      6 file(s)   **60,029 bytes**
                        18, 376, 520 bytes free

EDIT Command

EDIT command is used to create a text file and type text in it. It is executed in the following format:

EDIT [drive:] [file name] [Enter]

Here, in this format, **"drive:"** is the name of that drive, on which the file is to be created and "file name" is the name, by which the file is to be created. For example, following command will create MYFILE.TXT file on default drive:

EDIT MYFILE.TXT [Enter]
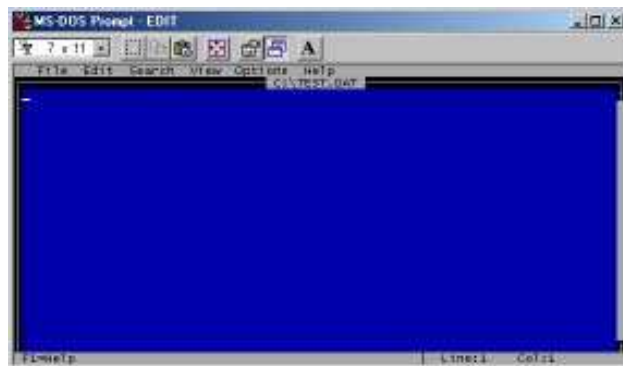
Figure 3.10

After execution of this command, a window, as illustrated in figure 3.10 will appear on the screen:

After getting the window on the screen, type the text as per instructions given in the following table:

Sr.No.	Task	Action
1.	Type the text	Use character keys of the keyboard to type the text.
2.	Take the cursor to the desired line and column.	Use arrow keys.
3.	Delete a word	Take the cursor to the beginning of the word and press CTRL and T keys together.
4.	Delete a line	Take the cursor to the line, which is to be deleted and then press CTRL and Y keys together.
5.	Insert text	Take the cursor to the place where text is to be inserted and start typing the text.
6.	Inserting a line between two lines	Take the cursor to the line, which is to be shifted below. After this, press Enter key.
7.	Save the file	Press ALT and F keys together and then press S key.
8.	Come out of EDIT	Press ALT and F keys together and then press X key.

TYPE Command

TYPE command is used for displaying the contents of a file on VDU. It is executed in the following format:

TYPE <file name.> [Enter]

Here, in this format, <file name> is the name of that file, contents of which are to be displayed on the screen. For example, if you wish to view the contents of MYFILE.TXT then following command is to be given:

TYPE A:TEST [Enter]

COPY Command

COPY command is used to make a duplicate copy of a given file. It is executed in the following format:

COPY <Source file name> <Destination file name>   [Enter]

Here in this format "Source file name" is the name of the file, which you wish to copy and "Destination file name" is the name of the file, in which the contents have to be copied. For example, if the contents of "MYFILE.TXT" file are to be copied in "MYFILE.BAK" then COPY command will have to be executed, as mentioned below.

COPY MYFILE.DAT MYFILE.BAK

REN Command

REN command is used for renaming an existing file. General syntax for REN command is as follows:

REN <Existing file name> <New file name>   [Enter]

To understand the usage of REN command, consider the following examples:

>   REN DATA.DAT INFO.TXT [Enter]

This command will change the name of DATA.DAT file to INFO.TXT.

DEL Command

DEL command is used for removing a file from the disk. In its simplest form, it can be executed as follows:

>   DEL <File name>   [Enter]

Here, in this format, "File name" is the name of the file along with drive reference, which is to be removed from the disk. To understand the usage of DEL command, consider the following examples:

>   DEL A:DATA.DAT   [Enter]

This command will remove DATA.DAT file from A: drive.

CD Or CHDIR Command

CD is short form of Change Directory. It is used for moving the current position from one directory to another directory. General format for CD command is as follows:

>   CD <Directory name>   [Enter]

Here, in this format "Directory name" is the name of that directory, to which you wish to move. To understand the usage and functioning of CD command, consider the following example:

If current directory has a directory named SECOND in it and you wish to move to that directory then CD SECOND, command will have to be given.

If you wish to move to root directory then CD \ command will have to be given.

If you wish to move to the parent directory then CD **..** command will have to be given.

If you execute CD command, without any file name, the name of current directory gets displayed.

MD Or MKDIR Command

MD is short form of Make Directory. This command is used for creating a new directory. It is used in the following format:

>   MD <Directory name>   [Enter]

Here, in this format, "Directory name" is the name that is to be assigned to the newly created directory. For example, if you wish to make a new directory with the name, "LETTERS", following command will have to be given:

>   MD LETTERS [Enter]

Note that when you make a directory, it is made in the current directory

RD Or RMDIR Command

RD is short form of Remove Directory. This command is used for removing the directory from the disk, provided it is blank. It is used in the following format:

RD <Directory name>   [Enter]

Here, in this format, "Directory name" is the name of that directory, which is to be removed. For example, if you wish to remove LETTERS directory, following command will have to be given:

RD LETTERS [Enter]

SYS Command

SYS command is used to make a media, like floppy, hard disk etc. bootable. While making it bootable, it copies IO.SYS, MSDOS.SYS and COMMAND.COM files at specific location on the media. Note that, since these files are copied at specific location hence the media becomes bootable. On the other hand, if you copy these files to the media, using COPY command, media will not become bootable. SYS command is used in the following format:

SYS <Drive name>   [Enter]

Here, in this format, "Drive name" is the name of the drive that contains the media, which is to be made bootable. For example, if floppy in drive A: is to be made bootable, following command will have to be executed:

SYS A: [Enter]

FORMAT Command

Format command makes tracks and sectors on the media, like floppy or hard disk. It is executed in the following format:

FORMAT   [Drive name]

Here, in this format, "Drive name" is the name of that drive that holds the media, which is to be formatted. For example, if you execute "FORMAT A:" command then the floppy, present in A: drive will get formatted.

MOVE Command

MOVE command, physically moves files and directories from one place to another. It is used in the following format:

MOVE <Source file name>   <Destination directory>

Here, in this format, "Source file" is the name of the file, which is to be moved from its current location to another directory. "Destination directory" is the name of that directory, in which the file is to be transferred. For example, if you wish to move SUM file into GTOTAL directory of root then following command will have to be given:

MOVE SUM GTOTAL   [Enter]

MOVE command can also be used for renaming the directories, as illustrated in the following example:

```
MOVE JAN   MONTH      [Enter]
```

Above-mentioned command will rename JAN directory to MONTH.

DISKCOPY Command

DISKCOPY command is used for duplicating the contents of a given floppy. When you make use of this command, all files and directories of one floppy get copied to another floppy. In its simplest form, it can be executed as follows:

```
DISKCOPY   <Source drive>      <Destination drive>
```

Here, in this format, "Source drive" is the name of that drive, which contains the floppy, whose contents are to be duplicated. "Destination drive" is the name of that drive, which holds the floppy, on which the contents have to be copied. For Example, if you wish to copy the contents from drive A: to B: drive then following command will have to be given:

```
DISKCOPY  A:  B:      [Enter]
```

WINDOWS OPERATING SYSTEM

Windows is the most popular operating system of modern times. It has been designed and developed by Microsoft Corporation of United States of America for Personal Computers.

Windows is single user multitasking GUI based operating system. It not only activates computer and makes its devices functional, but it also provides numerous applications for performing wide variety of tasks.

File Naming Convention In Windows

As you know, file is a medium to store data and information on computer. File is always identified by its name and the same name is used while operating upon it.

Recall that MS-DOS allows maximum 8 characters in primary name and three characters for extension name. Primary name and extension name are always separated by dot (.). The pattern of file names in Windows is slightly different from MS-DOS. Following points apply on file names in Windows:

1. File name can be up to 255 characters long.
2. Blank and dot (.) can also be used in file names. For example "My File" is a valid file name.
3. Characters like + ;   [=   ] etc. can also be used in file names
4. Characters like \ / : * ? " are still prohibited in file names.

Concept Of Folder

Folder is a special file, which is capable of holding other files and folders into it. In MS-DOS operating system they were called directory. In Windows, they are called folders.

Features Of Windows Operating System

Following are the features of Windows operating system:

GUI based Operating System

Windows is Graphical User Interface based operating system. It provides very simple, yet powerful and interesting mechanism for interacting with computer. It is a user-friendly operating system.

Multitasking Operating System

Windows is multitasking operating system. Thus in Windows, you can perform multiple tasks simultaneously. For example, while typing the letter through keyboard, you can view a movie on VDU and print the report on printer too.

Drag And Drop

Drag and Drop is a powerful feature of Windows. Using this feature, you can drag objects like files, folders etc. from their original location and drop them at some other place, with the help of mouse so that they could either be copied or moved there. For example, dragging file A, present in folder F1 and dropping it on folder F2 will move the file A from F1 to F2.

CUT COPY And PASTE

Cut, Copy and Paste is powerful feature of Windows. Using this feature, selected items like text, graphics, icons etc. can either be copied from their original place to a temporary memory location called Clipboard or from Clipboard to the desired location. Thus you can either move these items from one place to other or make duplicate copies of them. For example, when you select an item and perform CUT operation on it, it physically moves from its original place to the Clipboard. When you move to some other location and perform PASTE operation there, the item from Clipboard gets copied to the current location. Thus at the end of CUT-PASTE operation, selected item changes its place. Similarly when you perform COPY operation on a selected item, it gets copied into Clipboard (doesn't get removed from its original place, as it happens in the case of CUT operation). After this, when you change your current location and perform PASTE operation there, contents of Clipboard get copied to the new location. Thus a duplicate copy of the selected description gets made.

Object Embedding

This is one of the most powerful features of Windows operating system. It enables two or more programs to exchange objects like text, graphics etc. among them. For example, a drawing made in Paint program could be brought into the document, created through WordPad program so that figure could be embedded in the text. For example, you may type the description of Kutubminar in WordPad program and may draw the figure in Paint program. Using object embedding feature of Windows, you could place the figure of Kutubminar in Kutubminar text, so that it becomes complete text in itself.

Object Linking

Object linking is yet another powerful feature of Windows operating system. Using this feature, one object can be linked to the other object. Thus whenever linked object is modified or changed modifications/changes get visible in other object also. For example, you may type the description of Personal Computer in WordPad program and draw its figure in Paint program. Using object linking feature, you may link the computer figure to computer description so that it appears in the document (as it did in case of object embedding). Now whenever you will make modifications / changes in computer figure they will automatically get reflected in the description. You may note that overall effect of object embedding and object linking is same but automatic reflection of changes / modifications doesn't take place in case of object embedding.

Plug And Play

It is an important feature of Windows operating system. It makes the operating system, slightly intelligent. Whenever you attach a new device to the computer, operating system automatically senses its attachment and loads its device driver. Thus due to plug and play feature, new devices become automatically operational in Windows operating system.

Command Prompt

Using this feature, Windows provides MS-DOS working environment, within Windows environment. Thus all MS-DOS commands can be executed from Windows.

Useful Programs Of Windows

Windows is a powerful operating system. It not only makes the computer functional, it also provides many useful programs. Using these programs, you can perform different types of operations. Following are commonly used programs of windows:

Notepad   This program is used for creating small text files.

WordPad   This program is used for creating large text files. It also provides many formatting options, using which the document could be formatted and made attractive.

Paint   It is basically a drawing and coloring program. Using this program, you can create shapes and drawings and color them with attractive colors.

Calculator   Using this program you can use your computer as calculator and perform arithmetic and scientific calculations.

Media Player   Using this program, you can play audio and video files on you computer.

Movie Maker   Using this program, you can put graphical pictures in sequence and prepare multimedia presentations.

Windows Explorer Windows Explorer is a program, using which file and folder maintenance activities are performed on computer. Creating new folders, deleting old folders, moving or copying files from one folder to another are the activities, which are easily performed with

	the help of Windows Explorer.
Internet Explorer	Internet Explorer is basically a browser, using which activities like net surfing, net search, e-mail etc. are performed.

Different versions of Windows are available for use. They all are look-alike GUI based operating systems. They support all above mentioned features and utilities, but differ from each other in terms of their capabilities and additional facilities. Few popular versions of Windows are described below.

WINDOWS-9X

The term Windows 9x refers to three operating systems viz. Windows-95, Windows-98 and Windows-me.

As the names indicate, Windows-95 was released in the year 1995. It was plain and simple operating system, mainly developed for stand-alone computers. It did not have Internet features and utilities in it. For Internet operations, add-on software had to be installed on top of it. Windows-95 is now obsolete.

Windows-98 was released in the year 1998. In was enhanced version of Windows-95. Internet related aspects were included in it and Internet Explorer, the web browser, was made part of it. It became very popular within short span of time. There are many people who are still using Windows-98 today.

Another version of Windows, called Windows-me was released in the year 2000. Me stands for millennium. It was released as enhanced version of Windows-98 but had many internal problems, due to which it used to frequently crash. Windows-me had improved multimedia capabilities, video editing features and enhanced Internet facilities.

WINDOWS XP

Yet another improved version of Windows, called Windows-XP was released in the year 2001. It is 32-bit operating system that is quite popular on personal computers and laptops. It is quite stable product and is being continuously used till date. Many variations of Windows XP are there. They are named as Windows XP Professional, Windows XP Home, Windows XP Media center Editing and Windows-XP Embedded. For processors like Opteron operation, Athlon etc, which are 64 bit CPUs, Microsoft has created 64-bit version of Windows-XP to run on them.

Some of the existing features of Windows XP are given below:

1. **Built on the Windows-NT Engine**: It is built on the field proven code of Windows-NT and Windows 2000, which are 32-bit operating systems and support fully protected memory model. Due to this feature, Windows XP is quite stable and provides secure working environment.

2. **Enhanced Device Driver Verification**: When you install a new service on the system, Window, XP tests its driver rigorously. If the driver passes the test, its stability is ensured. This feature makes sure that system remains stable in most of the odd situations.

3. **Windows File Protection Mechanism**: This features protects core system files from being overwritten by the installation applications. If a file is over written, "Windows file protection" feature will restore the correct version of the file.

4. **Preemptive Multitasking Architecture**: Due to this feature, multi-tasking mechanism has been improved in Windows-XP. It now ensures better response and better stability.

5. **Scalable Memory and Processor Support**: Due to this feature, memory up to 4GB and two symmetric microprocessors can be supported in the system.

6. **Improvised Protection Mechanism**: Protection mechanisms have been improved at encryption and decryption level and at communication and transportation level also. Thus XP protects the information from hackers to a large extent.

7. **Smart Card Support**: Smart card capabilities have been included in the operating system. It builds faster and easier working environment.

8. **Firewall Enhancements**: To reduce the network risk and build tight security zone, lot of firewall features have been included within the operating system.

9. **Fresh Visual Design**: Although the working environment in Windows XP is quite similar to that of its elder brothers, Windows-9x, but it has a free look.

10. **Rich Digital Media Support**: Windows-XP provides rich digital media support. Its digital media player version 9 is quite powerful and provides facilities for:
    - *view rich media information.*
    - *receive best possible audio/video quality.*
    - *tune to at least 3,000 internet radio stations.*
    - *Create custom CDs that are very fast.*
    - *view DVD movies.*

11. **Integrated CD burring support**: Utilities for writing on CD-R and CD-RW have been incorporated in Windows Explorer of Windows-XP. Now the user need not buy third party software for it.

12. **Dual view**: In Windows-XP, a single computer desktop can be displayed on two monitors.

13. **Enhanced Customization Features**: Rich customization facilities have been incorporated in Windows-XP. Using these utilities, users and administrators can configure, customize and troubleshoot numerous Windows-XP functions.

WINDOWS-NT

Windows-NT is a 32 bit operating system that supports preemptive multitasking. Preemptive in respect to operating system means the ability of operating system to preempt or stop a currently scheduled task in favor of higher priority task.

Windows-NT is basically a network operating system. There are two versions of NT:

1. Windows NT Server.

2.   Windows NT workstation.

A brief description of both is given below.

Windows NT Server

Windows NT Server, as the name suggests, is designed to act as a server in network. It is multi purpose network operating system that integrates variety of network services in it.

Its software tool named, Microsoft management tool, helps in managing network and Internet operations. It supports high security features to safeguard the system from unauthorized users. Strong file protection mechanisms have been built into the operating system to safeguard users files and folders from others.

System policy editor and user profile features allow managing and maintaining user's desktops. System policies can be used to standardize desktop configuration, enforce behavior and control user work environment and actions.

Windows-NT Server's Network Monitor tool enables network administrators to examine network traffic and control it. Strong authentication certificate verification facilities have been built in the operating system so as to make it suitable for digital certificate related operations. Note that such operations are very much required in e-commerce functions.

File related, powerful, features are part of Windows-NT Server operating system. This features enables large data storage and on-line backup facility. The data written on one disk is also written on other disk (data redundancy), so that in the event of one-disk-crash, it could be retrieved from other disk.

On the whole, Windows-NT server is a robust operating system. It enjoyed populating for quite long but now other operating systems from the same manufacturer have replaced it.

Windows-NT Workstation

Windows-NT, as you know is a network operating system. In client server architecture mode of networking, Windows-NT Workstation operating system is for all those computers, which are connected to the network in client mode. In it looks, it resembles Windows-95 or Windows-98 but is an entirely different operating system. Being part of Network environment, it has tight security features and network features incorporated in it. It promotes distribute data processing as well as stand alone mode of operations.

Note that with the advent of Windows-2000, Windows-NT server and Windows-Workstation operating systems, both are almost obsolete now.

WINDOWS-2000

Windows-2000 operating system came as replacement of Windows-NT. It is basically GUI based network operating system. It has been designed for uniprocessor and symmetric multi-processors based computers. It is 32-bit operating system. Its working in it environment looks like its elder brothers, Windows-NT, Windows 9x etc. As the name indicates, it was released in the year 2000. Its four version are:

1.   Windows-2000 Professional.

2. Windows-2000 Server standard edition.
3. Windows-2000 Advanced server edition.
4. Windows-2000 Data center server.

Windows-2000 Professional is Microsoft's mainstream desktop operating system for business of all sizes. It provides high level of security, state-of-the-art features for mobile users and enhanced throughputs. In its capabilities, it falls a bit lower than Windows-2000 server edition.

Windows-2000 Server standard edition is an operating system for network servers. It suits well for business of average size and the computers with maximum 2 processors.

Windows-2000 advanced server edition is a powerful operating system. It has been designed for multiprocessor computers, which have up to 4 microprocessors in them. It provides enhanced memory support and more rigorous printing facilities for great print load operations. Additional features for network balancing have been incorporated in this version.

Windows-2000 Data Center server is the most powerful operating system of this series. It has been designed and developed for high-end voluminous data handling operations. It is capable of handling up to 32 processor based computers.

Windows-2000 is known as hybrid kernel operating system. Architecturally it is divided into 2 modes:

1. User mode
2. Kernel mode

Kernel mode provides unlimited access to system resources and facilities, while user mode is heavily restricted mode. All the versions of Windows-2000 look alike in their looks and provide common functionality. They also support Windows-NT file system, called NTFS 5. It is a robots operating system and is quite popular.

LINUX

Linux is basically multi user, multitasking operating system. It provides character user interface and graphical user interface both for interacting with computer.

It was originally designed and developed by Linux Benedict Torvalds in the year 1991. Basic objective behind developing Linux was to bring out an operating system, which was low in cost and had the power of UNIX operating system. Linux got his operating system included in GNU project of Free Software Foundation, to make it available free of cost, all across the world. Its core version is available free of cost to everyone. Many software-developing companies have incorporated many functionalities into it and are marketing it. Red Hat's Linux is one such operating system and many more also exist.

Linux also has powerful networking features incorporated into it and has built in Internet facilities.

Linux has gained popularity these days and is emerging as a parallel competitor of Windows and Unix operating systems.

Linux operating system provides both types of user interface. It supports CUI and GUI both. Graphical Interface of Linux provides windows look alike working environment. Features like drag and drop, Cut and paste, file sharing, multitasking etc. are also available in Linux.

Character User Interface of Linux is really powerful and provides thousands of commands for doing wide variety of tasks. Using Linux's meta language and shell features, many commands can be coupled together and new commands can be formed. Following are few Linux commands, which are used in day-to-day functions:

ls	:	This command displays the names of all the files present in current directory.
cat	:	This command displays the contents of a file.
cp	:	This command copies the contents of a file into another file.
mv	:	This command moves a file from one directory to another directory.
mkdir	:	This command makes a new directory.
rmdir	:	This command removes a blank directory.
cd	:	Using this command, user can move from one directory to another.
pwd	:	This command shows the name of current directory.
vi	:	Using this command, a new file can be edited and text written in it.
lp	:	This command prints a file on the printer.
passwd	:	This command is used for changing the password.
chown	:	This command changes the ownership of a file.
chmod	:	This command changes file permissions.
who	:	Names of all current users get list through this command.
ps	:	Names of all processes, currently running on the system get listed by this command.
find	:	This command is used for finding, if the file of given name is present on the disk or not.
grep	:	This command is used for searching the occurrences of a given string in a file.
sort	:	This command sorts the given contents either in ascending or descending order.
write	:	Using this command one user can send text message to other user, who is currently on-line in multi-user environment.
mail	:	This command is used for sending e-mails to other users of the system.

Linux is a powerful operating system, which is getting more and more popular every day. Most of the hardware vendors have started bundling their products with Linux. Large

population of Personal Computers (PC) and Laptops comes with preloaded Linux, these days. It is likely to gain more popularity in coming future.

WHAT IS BOOTING?

The process of loading the operating system in computer's memory is called booting. When you switch on the computer, it reads a special program, called bootstrap program from ROM and execute it. On its execution, it carries out a self-test. During self test all the peripherals and devices of computer are checked. If any fault is found in them a corresponding errors message is displayed on the monitor and booting process stops. On the other hand, if no peripheral is found faculty, operating system is read from the disk and loaded into computers memory. At the end of booting process computer becomes ready for accepting commands, executing them and displaying result. Booting is the first and foremost task that is to be performed when computer is to be used.

Note that through tunable parameters, booting device searching sequence can be set for the computer. Once this sequence is set, computer looks for operating system on the devices mentioned in device searching sequence. For example, if the booting sequence has been set as hard disk, CD drive and floppy drive then first computer will search the operating system on hard disk. If it gets it there, it will load it in computer's memory. If it doesn't get it there, it will search it on CD drive. If it gets it there it will load it else it will search the floppy drive. If it doesn't get it on any of the drives, it will display corresponding error message. As mentioned above, this booting search sequence can be changed as per requirements.

WHAT IS SHUTDOWN?

The process of switching the computer off is called shutdown. The procedure for shutdown varies from operating system to operating system. During shutdown, computer stops all running processes, saves current settings, closes all opened files and disconnects from all the links.

SUMMARY

Operating System is the most essential software for the functioning of computer. It activates all the units of computer and makes it capable of accepting commands from the users and executing them. Without operating system, computer cannot work.

Before starting any work on computer, operating system has to be loaded in computer's memory. The process of loading the operating system in computer's memory is called booting.

Prime responsibilities of operating system are:

1. *Performing internal management functions.*

2. *Providing services.*

3. *Providing user interface.*

Following are internal management functions that are performed by the operating system:

1. *Process management functions*
2. *Memory management functions*
3. *Information management functions*
4. *Device management functions*

Services of operating system are basically the commands and applications, using which various types of tasks are performed on computer. They are part of operating system.

User interface is basically the style, in which user has to interact with computer. Generally it is of following two types:

1. *Command Line Interface (CLT).*
2. *Graphical User Interface (GUI).*

In command line interface user interacts with computer through textual commands while in graphical user interface he interacts through graphical objects like icons, menus, dialog boxes etc.

Easy to use, reliability, speed and efficiency, reusability, security, adaptability, compatibility, multi media support etc. are few most desirable characteristics of operating system.

Operating systems can be broadly classified into following categories:

1. ***Single user operating systems:*** *Single user operating systems are those operating systems, which allow only one user to work on the system at a time. MS-DOS, Windows etc. are examples of single user operating systems.*

2. ***Multi user operating systems****: Multi user operating systems allow multiple users to work on the system simultaneously. Linux, UNIX etc. are examples of multi-user user operating systems.*

3. ***Network operating system:*** *A network operating system is an operating system, which includes special functions, protocols and device drivers for connecting the computers of the network. Windows-NT, Windows-2000, Windows-3000 etc. are examples of network operating system.*

EXERCISES   CHAPTER 5

Short Type Questions

A. Select best possible options for following questions:

1. Which software activates the computer?

   (a) Commands   (b) User Interface

   (c) Operating System   (d) Utilities

2. What is booting?

   (a) Carrying out a self test   (b) Loading operating system in computers memory

   (c) Checking computers memory   (d) Executing a command

3. Which of the following management function is not performed by operating system?

   (a) Information management   (b) Software management

   (c) Device management   (d) Memory management

4. Which of the following is single user multitasking operating system?

   (a) MS-DOS   (b) Windows-XP

   (c) Windows-2000   (d) Unix

5. Which of the following is not a GUI component?

   (a) Radio button   (b) Menu

   (c) Command   (d) Text box

6. Which type of user interface does MS-DOS provide?

   (a) GUI   (b) CUI

   (c) ABI   (d) MGI

7. Which type of user interface is provided in Windows-XP?

   (a) GUI   (b) CUI

   (c) ABI   (d) MGI

8. What that feature is called, which permits a user to execute multiple programs simultaneously?

   (a) multi user   (b) multi tasking

   (c) multi programming   (d) multi process

9. Maximum how many options can be selected from a radio button list?

   (a) As many as required   (b) all the option present in list

   (c) 1   (d) 0

10. Maximum how many options can be selected from a check box list?

    (a) As many as required   (b) all the option present in list

    (c) 1   (d) 0

B. Fill in the blanks:

11. .... is the software, which enables the computer to perform read / write functions.

12. That user interface, in which user interacts with computer, using commands is called ....

13. That user interface, in which user interacts with computer, using graphical items is called ....

14. .... is an example of network operating system.

15. .... is an example of multi user operating system.

16. GUI is acronym for ....

17. .... command of MS-DOS will be used to view the names of all the files present in current directory.

18. Directory in MS-DOS serves same purpose, which .... does in Windows.

19. In Linux .... command is used for creating a new directory.

20. In MS-DOS .... command can be used for viewing the contents of a file.

C. State true or false:

21. The term, Windows-9x is used as common name for Windows-2000, Windows-3000 etc.

22. MS-DOS is single user, multi tasking operating system.

23. Windows is single user multi tasking operating system.

24. Unix provides CUI interface to interact with computer.

25. Process management function is one of the responsibilities of operating system.

26. Multi-user operating system and Network operating system, both, provide the facility that multiple users could use the same system.

27. Windows-2000 is an example of multi user operating system.

28. In GUI, user has to type command for interacting with computer.

29. Writing data and reading it are the activities, which fall into the category of memory management that operating system performs.

D. Answer the followings question in short:

30. In which type of user interface, user has to type the command to interact with computer?

31. In which type of user interface, user has to interact with computer through graphics and pictures?

32. Name at least four types of management functions that operating system performs.

33. Name any two operating systems, which are multi-user operating systems.

34. Name any three operating systems that are network operating systems.

35. Name that program of Windows, using which small text files are created.

36. What do you call that software, which activates computer?

37. What do you call that process, which loads the operating system into computer's memory?

38. Name any five GUI components that are generally provided in any GUI based operating systems.

39. What does the term Windows-9x signify?

40. What is Windows-NT?

Detailed Answer Type Questions

E. Answer the following questions in detail:

41. What is operating system and what is its purpose? Name any four popular operating systems?

42. What do you understand by following? Explain them in brief, giving a suitable example:

   (a) Process management function.   (b) Information management function

43. What is booting? Why it is required?

44. What is the function of following MS-DOD commands? What are their equivalent commands in Linux?

   (a) DIR   (b) CD   (c) TYPE   (d) COPY

45. How MS-DOS is different from Window? Give at least four arguments.

46. Describe multitasking feature? What is plug and play feature of Windows operating system?

47. What do you understand by multi user feature of operating system? Name any two operating systems that support this feature.

48. What is CUI interface? Explain it by giving a suitable example.

49. What is GUI interface? Explain it by giving a suitable example.

50. Describe at least three features of multi-user operating systems. How multi-user operating systems are different from network operating systems?

51. Describe object embedding features of Windows.

52. Describe object linking feature of Windows.

53. Differentiate between object embedding and object linking features of windows.

54. Describe cut, copy and past features of Windows.

55. Explain at least 5 new features of Windows-XP.

56. Describe at least 5 most desirable features of operating system.

57. What do you understand by reliability and adaptability of operating system.

58. Describe similarities and differences in file naming conventions of MS-DOS and Windows.

59. What is directory? What are its advantages? Name any three directory related commands of MS-DOS.

60. Describe at least three features of Windows. Name any three applications of Windows and their uses.

****