

# UNIT-7

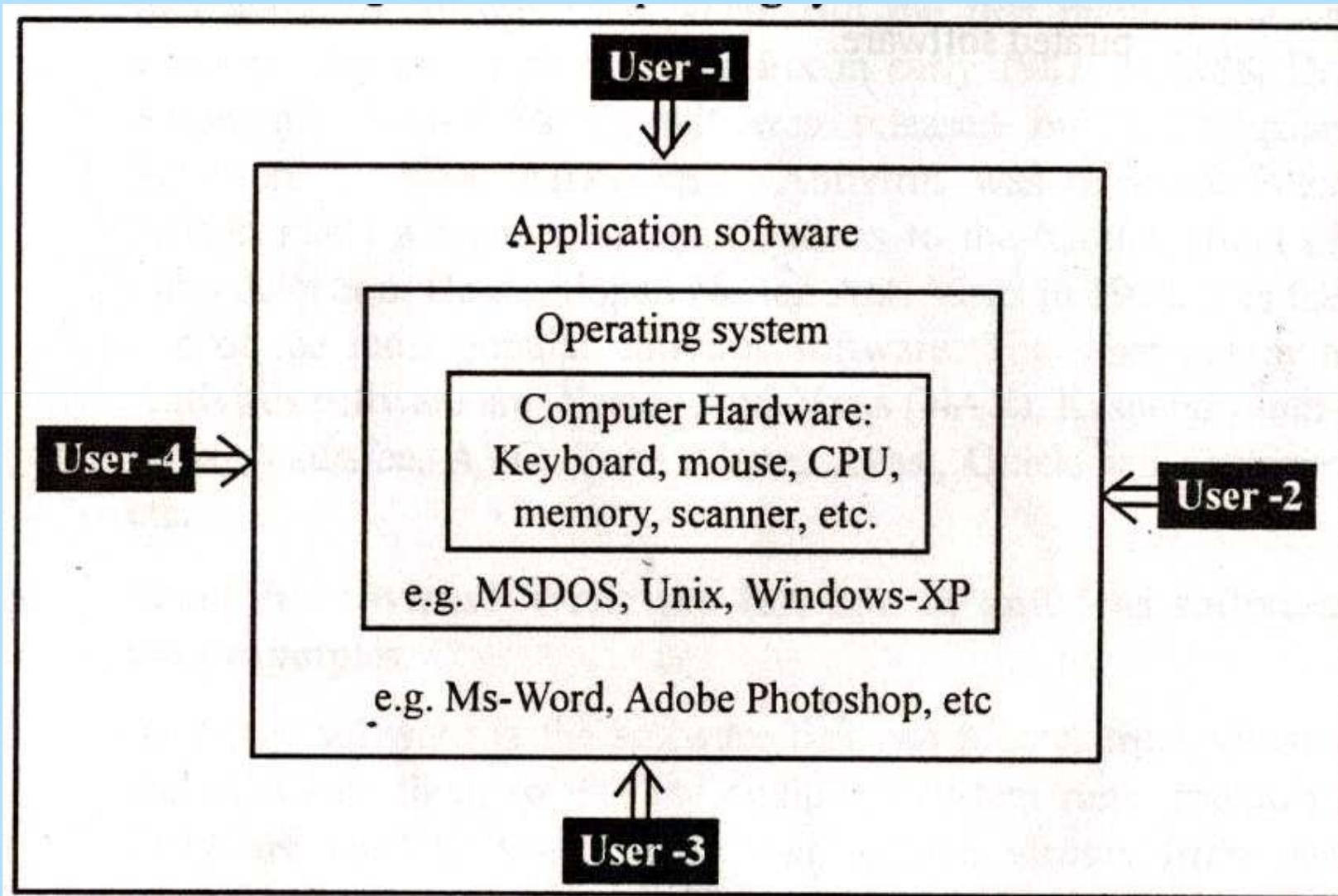
## OPERATING SYSTEM



# 1. What is an operating system? Draw the basic organization of operating system.

An operating system is an integrated set of programs that controls the resources of a computer system and provides its users well defined environment for the overall operation in the computer. It is one of the most important types of system software that is responsible for the overall management of various activities of the computer and the sharing of computer resources. Some of the common and popular operating system software are: 4S-DOS, LINUX, UNIX, Windows Operating System, Mac Operating System etc.

**The basic organization of operating system is shown below.**



- Therefore an operating system is an interface between computer hardware, application software so that users can use them properly.
- Since, the operating system controls and manage all the resources such as the CPU, I/O device, memory, etc. and schedules its operation fairly and efficiently, it is also considered as resource manager.

## 2. Explain the main function of operating system.

The main functions of operating system are:

- a. **Input / Output management:** This is the function of operating system which allows computer to recognize and interact with input and output devices such as mouse, keyboard, printer, NIC card, modem, etc.
- b. **Command Interpretation:** This function of operating system takes care of interpreting user commands, and directs the system resources to handle the request. It also translates such commands, into a detailed set of instructions.

**c. Memory management:** The memory management function of operating system allows of the allocation and reallocation of memory spaces to the various programs in need of these resources. Thus, Operating System allocates required memory to load the program and into the RAM and frees the memory and allocates to other program when the current program terminates.

**d. Security:** This is another important function of operating system which protects the resources and information of computer system against destruction and unauthorized access. This helps to keep data, file, program etc safe for the authorized users.

**e. File management:** This is another function of Operating System which allows managing the overall activities related to the files such as organization, storage, retrieval, naming, sharing, opening, closing, protecting files, etc.

**f. Virtual memory management:** This is a special type of function of Operating System in which the free space of secondary memory such as hard disk is used as primary memory when the user is running larger program than the capacity of primary memory.

**g. Deadlock prevention:** Deadlock is the situation which can arise when a resource is shared by two or more process. In such situation the Operating System carefully handles and allows the resources properly to avoid the problems.

### **3. Explain the type of operating system based on processing.**

On the basis of processing, the operating systems are classified as:

#### **a. Batch processing OS:**

In batch processing operating system , the job (data + program) is not processed until all the data are fully input. The Jobs are stored in a disk in a batch queue and run one or more at one time under the control of operating system. A job may wait in a batch queue for a minute or even for hours depending upon the load of system. Example of batch Operating System are: MS-DOS, Apple-DOS, etc.

## **b. Multitasking OS:**

A multitasking Operating System provides the ability to run more than one program at once. For example a user could be running MS word package, copying files, printing documents, formatting pages, etc at once. So, such Operating System lets user to perform more than one task at a time.

## **c. Multi-processing OS:**

This is a type of operating system, in which more than one processor operate in a co-ordinate way. They share the main memory, input or output devices and other resources. The processor can execute different programs independently and simultaneously. They can also execute the portion of the same program.

#### **d. Time-Sharing OS:**

This is the type of operating system in which several users work on the computer through the terminals which are connected to a single CPU and operate such as a time shared basis. The CPU allows the fixed time period to each of the user in round robin basis.

#### **e. Real-Time OS:**

This is a type of online operating system that response to input immediately. This operating system is designed for the propose of controlling and monitoring external activities with timing constraints. These types of operating system are mainly used to handle machine tools, controlling and monitoring the nuclear power station and missile-launching system, etc.

## 4. Differentiate between CUI and GUI operating system or MS DOS and Windows Operating Systems.

CUI OS (MS-DOS)	GUI OS (Windows)
1. It stands for Command Line User Interface or Character User Interface.	1. It stands for Graphics User interface.
2. These operating system are difficult to use and understand because user has to remember each command.	2. These operating system are easy to use and understand because Commands/programs are graphically presented.
3. These operating system do not support additional peripheral devices and multimedia.	3. These operating system support additional peripheral devices and multimedia system.
4. These operating system do not support Networking and internet services.	4. These operating system fully support the networking and internet services.
5. They are single user, single tasking operating system.	5. They are multiuser, multitasking operating system.
6. These operating system are much faster than GUI operating system.	6. These operating system are much slower than CUI operating system.
7. These operating system can be run with low configured computers.	7. These operating system need high configured computer to run.
8. Example: MS-DOS	8. Example: Window XP

## 5. What is booting of computer? Explain the types of booting.

**Booting** is the process of loading system files into the computer's memory from disk is called booting. It starts when the computer is turned on. It is the process of making computers ready to work. In the booting process the command interpreter files and system are loaded in to the computer's memory. This process is done by a program (called the bootstrap loader) that is stored permanently in the computer's electronic circuitry (usually on a ROM chip).

There are two types of Booting:

1. Cold booting
2. warm booting

## 1. Cold booting:

This is a type of booting in which the computer is started by pressing power button on when it is at off stage. During the cold booting process, the main power supply or UPS is turned on then the computer gets started. A cold boot is better than warm boot because it completes the boot-up sequence.

## 2. Warm booting:

This is a type of booting in which the computer is restarted by pressing Ctrl-Alt-Delete key at once or using re-set button or using shutdown command like Shutdown.exe -r when the computer is already at on stage. During the process, the system restarts with warm booting as the power supply of the computer does not shut down for a simple moment.

## 6. Write short notes on the following terms related to operating system.

### a. Wild Cards:

The wild card characters are the special symbols that can be used to represent any character or group of characters in command statement. They provide quick functioning and flexibility to write commands especially in CUI systems. Some of the common wild card characters are:

Wild cards	Functions/meanings
*	indicates set or group of characters
?	Represents single characters
*	indicates any file name and extension
:	Indicates drive specification
/	Indicates an option
>	Indicates redirection
A	Indicates control sign

## **b. Autoexec. Bat File:**

This is an automatically executable special batch file of MSD OS which contains a series of commands that are to be executed one after another when the PC is booted. It is also known as start up file kept in root directory of startup drive which is used to control the setting of the system date, time, path, etc.

## **c. Configuration system (config.sys file)**

This is a special file which is kept at start up disk of root directory of DOS which controls maximum number of files, buffer area, hardware devices, etc. This file also contains two types of commands. The first type of configuration commands which determine the capability that is to be made available for use. The second types of commands are related to the device drivers that are assisting to control the peripheral and memory devices.

#### **d. My computer:**

My computer is a special folder of windows operating system that stores and displays all the contents of computer such as hard disk drives, removable storage devices and their related programs. We can display and open the contents from my computer folder by double clicking over it.

#### **e. Recycle bin:**

The recycle bin is a special folder of windows operating system on the hard disk. This folder is available on desktop of windows operating system which contains files and folders that are deleted from the hard disk. Any files or folder we delete knowingly or by mistake from the hard disk are first transferred to the recycle bin. The use and advantage of recycle bin is to recall and restore such deleted files in their original location.

## **Q.7 “The “WIMP” environment is much easier and user friendly”. Explain this statement.**

WIMP (Windows, Icon, Menu, and Pointer) is also known as GUI (Graphical User Interface) environment. In human—computer interaction, the WIMP denotes a style of interaction using these elements of the interface. The term WIMP was coined by Merzouga Wilberts in 1980. Other expansions of WIMP are sometimes used, substituting “mouse” and “mice” or “pull-down menu” and “pointing”, for menus and pointer, respectively.

It is because, in this environment, users are provided and displayed the commands and programs with icons, pointer, menus and windows as well many other additional elements on the screen with some explanatory texts. As a result, every element on the screen clarifies itself to the users so that users do not need to remember complex syntax and commands but just clicking by the pointer on icon can perform the related job. Ultimately, the user finds it comparatively easier and comfortable to use.

Therefore in a WIMP system:

A window runs a self-contained program, isolated from other programs that run at the same time in other windows.

- An icon acts as a shortcut to an action the computer performs (e.g., execute a program or task).
- A menu is a text or icon-based selection system that selects and executes programs or tasks.
- The pointer is an onscreen symbol that represents movement of a physical device that the user controls to select icons, data elements, etc.

Thus, in the WIMP environment, the windows menu can be pointed on the screen and controlled by a device called mouse in order to select any command or program as per choice. It provides interactive environment to the user which becomes very easy and interesting to learn and use. Moreover, it also supports multi tasking (i.e. run multiple programs) and multimedia system too. Hence, the computer users now-a-days are fully oriented towards “WIMP” instead of earlier CUI environment. Thus, the WIMP environment is much easier and user friendly.

## 8. What is dialog box? Mention the elements of dialog box.

A dialog box in GUI programs is a communication box, which appears temporally on the screen informing the user about some message or commands and allows the user to carry out the command actions. It provides some of the common options such as ok, cancel, next, previous, finish, save, open, etc. which can be chosen by the user according to requirement.

The dialog box may contain one or more of the following elements.

- List boxes (drop down and pull down)
- Radio buttons
- Check boxes
- Slider and spinner etc.

## **9. What is MS-DOS? Write its common features.**

Micro Soft Disk Operating System is a single user single tasking CU! based operating system developed by Microsoft corporation USA for the original IBM PC.

The features of MS-DOS are:

- a. it is character user interface based operating system.
- b. It is single user and single tasking Operating System.
- c. It supports both hard disk and floppy disk.
- d. It can co-exist with other operating system in the same drive.
- e. It is machine independent so supports different languages.
- f. It manages files and folders in hierarchical order.
- g. It supports print spooler.

## 10. What is Window Operating System? Write its features.

Microsoft windows or popularly known as windows is most popular and user friendly GUI based operating system developed by Microsoft corporation USA. Windows is easy to operate since it supports pointing device (mouse) and simply clicking over the icons commands can be accessed. Windows is available in different versions. Such as windows 98, windows 2000, Windows XP, Windows 7, Windows 8 etc. In every new version of windows additional features and facilities are added than the earlier older versions.

### Features of Windows OS

- a. It is GUI based Operating System so easy to use and operate.
- b. It supports the pointing devices like mouse, touch pad etc.
- c. It is multiuser, multitasking operating system.
- d. It supports additional devices and multimedia system.
- e. It supports Internet and Networking system.
- f. It provides high level security to the data and programs.
- g. It can be used with server in networking system.
- h. It supports various programming languages.

## 11. Write short notes on UNIX and LINUX operating system.

UNIX: UNIX is one of the popular operating system written in C programming language. It is a multiuser time sharing operating system which is supported by wide range of computers, manufactured by different companies including Hewlett-Packard, Sun Microsystems, IBMs, Silicon Graphics etc. The UNIX was developed by Ken Thompson and Dennis Ritchie at Bell Laboratory USA in 1970s.

LINUX: LINUX is one of the most popular open source operating system. It is multi user operating system which was originally 'designed for personal computers. The LINUX operating system is named after the inventor "Linus Torvalds" who invented this operating system at the University of Helsinki, Finland in 1990s. 'r inventing the LINUX operating system, Linus Torvalds

posted the code on internet and asked feedback from thousands of programmers across the world.

## **12. What are system tools? Explain the common tools of windows which make maintenance process easier.**

System tools in windows operating system allows to perform some basic system maintenance task from time to time to keep windows running smoothly. Windows operating system provides some of the basic tools. They are:

### **a. Disk defragmenter:**

It is a system tool which allows to defragment (make together) the fragmented (scattered) data, files and restore into the whole file or full document which increase the system performance and access speed of data.

To use this tool click on

Start — All programs — Accessories — System tools — Disk defragmenter.

## **b. Disk clean up:**

This is another important system tool that helps to keep window operating system smooth as it should be. It inspects the hard disk of PC and looks for unnecessary files that can be safely deleted allowing freeing up the valuable disk space. To use this tools click on Start -> All programs —> Accessories —> System tools —\* Disk clean up

## **c. Scan disk:**

It is another important tool that allows making the disk up to date for data storage and retrieval system. Scandisk is one of the software security measures which works as a utility tool in order to scan, detect and repair the errors in the disk. The scandisk checks the specified disk for bad sectors and other related problems and makes possible repairing.

**d. Backup:** This is one of the important tools that allow making the reserve or extra copy of data, file, programs, documents etc. which can be restored later in its original location when they are deleted or not available. The backup system is very important and necessary to prevent data, software and programs from loss, damage and virus attack.

**THANK YOU!**