CHAPTER – 2

INTRODUCTION TO GUI BASED OPERATING SYSTEM

2 INTRODUCTION TO GUI BASED OPERATIONG SYSTEM

1.1 Introduction

An operating system manages the computer's memory, processes, and all of its software and hardware.

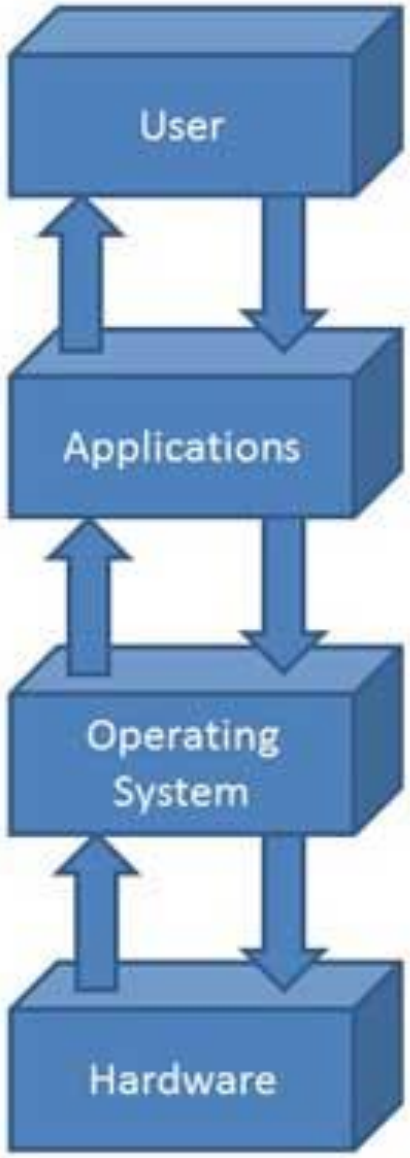
It also allows you to communicate with the computer without knowing how to speak the computer's "language".

Without an operating system, a computer is useless.

2.1 Objectives

The reader will able to understand the following

- ❑ Basics of Operating System
- ❑ User Interface of Operating System
- ❑ Operating System Settings
- ❑ File and Directory Management
- ❑ Types of file



2.2 Basics of Operating System

The Operating System is a program with the following features −

- An operating system is a program that acts as an interface between the software and the computer hardware.
- It is an integrated set of specialized programs used to manage overall resources and operations of the computer.

Characteristics of Operating System

Here is a list of some of the most prominent characteristic features of Operating Systems −

Memory Management − Keeps track of the primary memory, i.e. what part of it is in use by whom, what part is not in use, etc. and allocates the memory when a process or program requests it.

Processor Management − Allocates the processor (CPU) to a process and deallocates the processor when it is no longer required.

Device Management − Keeps track of all the devices. This is also called I/O controller that decides which process gets the device, when, and for how much time.

File Management − Allocates and de-allocates the resources and decides who gets the resources.

Security − Prevents unauthorized access to programs and data by means of passwords and other similar techniques.

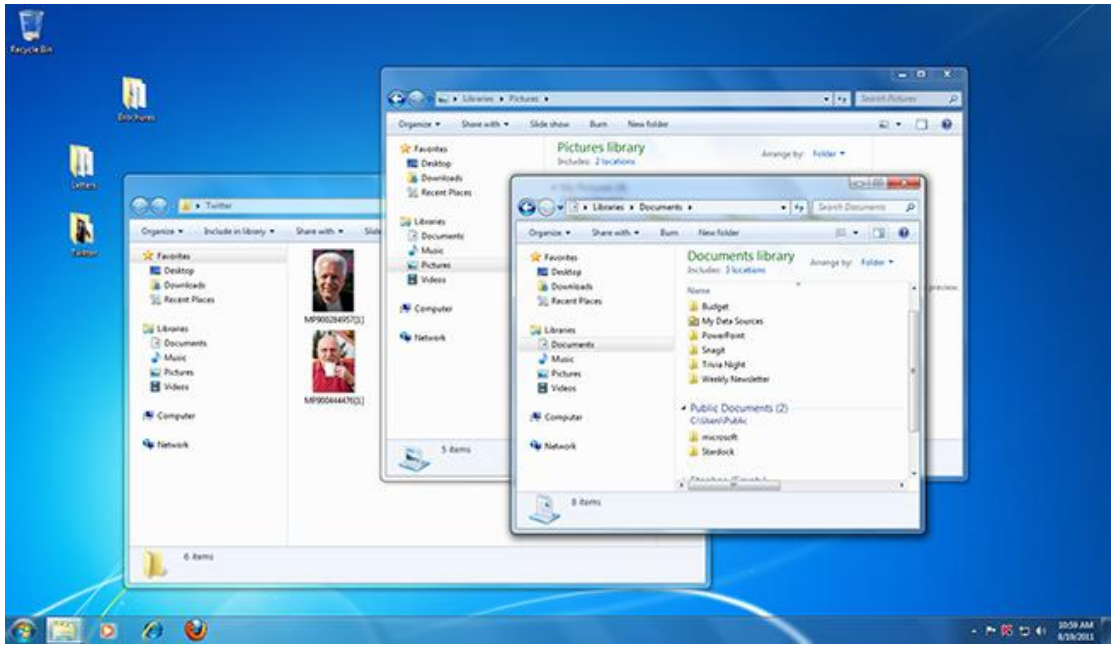
Job Accounting − Keeps track of time and resources used by various jobs and/or users.
Control Over System Performance − Records delays between the request for a service and from the system.

Error-detecting Aids − Production of dumps, traces, error messages, and other debugging and error-detecting methods.

2.2.2 Types of Operating System

Type of Operating System	Example OS	Short Description
Time-Sharing OS (Multitasking)	UNIX, Linux , Windows , MacOS	**Allows multiple users/programs to share CPU time simultaneously.**
Distributed Operating System	LOCUS	**Manages multiple computers and makes them act like a single system.**
Network Operating System	Windows Server	**Provides services (file sharing, user access) across a computer network.**
Real-Time Operating System (RTOS)	VxWorks	**Processes data instantly with strict time constraints.**
Mobile Operating System	Android, iOS	**Designed specifically for smartphones and tablets.**
Embedded Operating System	Embedded Linux, QNX	**Built for embedded systems like smart TVs or appliances.**
Multi-user OS	UNIX, Linux	**Multiple users can access the system simultaneously.**
Single-user OS	MS-DOS	**Only one user can use the system at a time.**
Multiprocessing Operating System	Windows, Linux	**Supports running programs on multiple CPUs at the same time.**

Microsoft Windows



Microsoft created the Windows operating system in the mid-1980s. Over the years, there have been many different versions of Windows, but the most popular ones are Windows 7 (released in 2009), Windows Vista (2007), and Windows XP (2001). Windows comes preloaded on most new PCs, which helps to make it the most popular operating system in the world.

Linux

Linux (pronounce LINN-ux) is a family of open source operating systems, which means that they can be modified and distributed by anyone around the world. This is very different from proprietary software like Windows, which can only be modified by the company that owns it (Microsoft). The advantages of Linux are that it is free, and there are many different distributions (or versions) that you can choose from. Each distribution has a different look and feel, and the most popular ones include Ubuntu, Mint, and Fedora.

Advantages of Linux over Window

- Open Source Nature
- Secure
- Can revive older computers
- Perfect For Programmers
- Software Updates
- Customization
- Variety Of Distributions
- Free to Use
- Better Community Support
- Reliability
- Privacy

The Cons of Linux

- It isn't as user friendly as Windows or as 'straight out of the box.'
- There isn't a dedicated tech support, so getting 'fixes' for things is in your hands unless you want to subscribe to Enterprise Linux. However, you do get the software free so it's something to consider.
- If you are a gamer, you will prefer Windows as most of the games aren't available but that's not to say you can't. Just not as much and as easy.
- Drivers don't really exist, there will be work arounds but users have reported problems when trying to use certain hardwares or old hardwares.
- It's probably better used as a dual boot rather than a Windows replacement due to the fact you can't get propriety programs on it and although they offer cousins, it won't be the same. Photoshop is Photoshop, after all.

Kernel

The kernel is the central component of the system that communicates directly with the hardware. In fact, the name "Linux" properly refers to a particular kind of this piece of software. It allows programs to ignore the differences between various computers. The kernel allocates system resources like memory, processor time, hard disk space and external devices to the programs running on the computer. It separates each program from the others, so that when one of them encounters an error, others are not affected. Most users don't need to worry about the kernel in day-to-day use, but certain software or hardware will require or perform better with certain kernel versions.

Shell

The shell, sometimes also called "command line", implements a textual interface that allows you to run programs and control the system by entering commands from the keyboard. Without a shell (or something that can replace it, like a desktop environment) making your system actually do something would be difficult. The shell is just a program; there are several different shells for Linux, each of which offering somewhat different features. Most Linux systems use the Bourne Again Shell (Bash). Linux shells support multitasking (running several programs at once).

File System

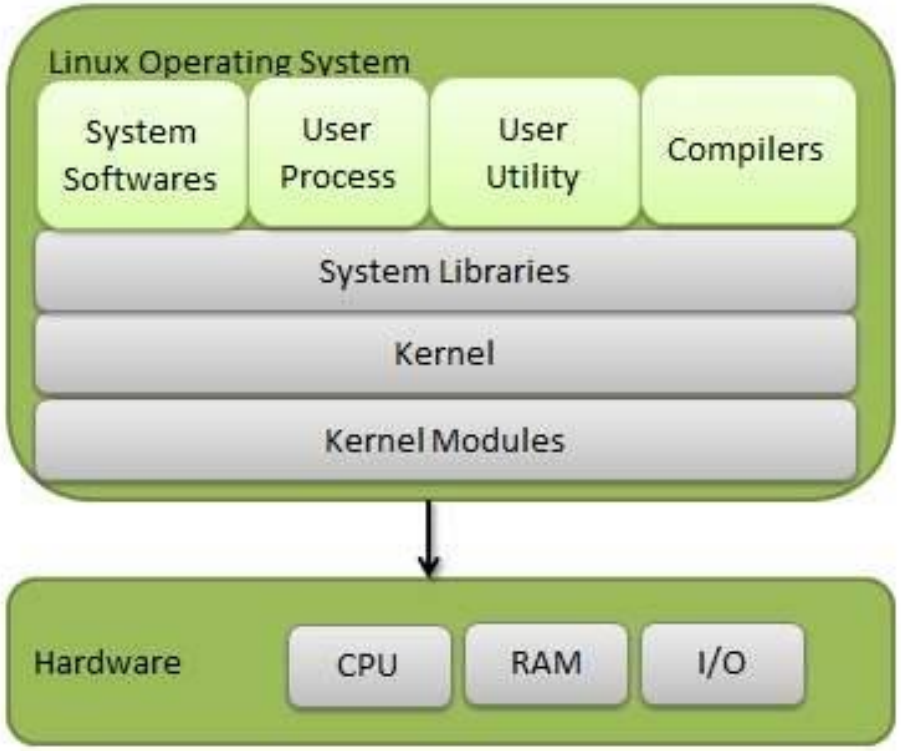
- There are several file systems that Linux-based distributions use. They are BTRFS, EXT3/4, VFS, NILFS, and SquashFS.
- In Linux, the top-level directory is called the root directory. Every file and directory in the system must be a descendant of the root directory. (It is common to talk about directories using the terminology of family relations, like "parent," "child," "descendant," "ancestor," "sibling," and so forth.) Names of files and directories can contain all characters except the null character (which is impossible to enter from the keyboard) and the "/" character. An example path would be:

- This path refers to a file called "error.log" which is found in a directory called "apache," which is a subdirectory of a directory called "logs," which is subdirectory of a directory called "var," which is a subdirectory of the root directory. The root directory doesn't have a name like the other; it is just denoted with a "/" character at the beginning of the path.

- The root directory usually contains only a small number of subdirectories. The most important are:
- bin - programs needed to perform basic tasks, i.e. change a directory or copy a file
- dev - special files that represent hardware devices
- etc - configuration files
- home - contains private directories of users
- media or mnt - Mount point for external drives connected to this computer, i.e. CDs or USB keys
- tmp - temporary files
- usr - programs installed on the computer
- var - variable data produced by programs, like error logs

Components of Linux System

- Linux Operating System has primarily three components
- Kernel − Kernel is the core part of Linux. It is responsible for all major activities of this operating system. It consists of various modules and it interacts directly with the underlying hardware. Kernel provides the required abstraction to hide low level hardware details to system or application programs.
- System Library − System libraries are special functions or programs using which application programs or system utilities accesses Kernel's features. These libraries implement most of the functionalities of the operating system and do not requires kernel module's code access rights.
- System Utility − System Utility programs are responsible to do specialized, individual level tasks.



Basic Features

Portable − Portability means software can works on different types of hardware in same way. Linux kernel and application programs supports their installation on any kind of hardware platform.

Open Source − Linux source code is freely available and it is community based development project. Multiple teams work in collaboration to enhance the capability of Linux operating system and it is continuously evolving.

Multi-User − Linux is a multiuser system means multiple users can access system resources like memory/ ram/ application programs at same time.

Multiprogramming − Linux is a multiprogramming system means multiple applications can run at same time.

Hierarchical File System − Linux provides a standard file structure in which system files/ user files are arranged.

Shell − Linux provides a special interpreter program which can be used to execute commands of the operating system. Security − Linux provides user security using authentication features like password protection/ controlled access to specific files/ encryption of data.

SUMMARY

In this Chapter you learned

- What is OS?
- Types of OS
- Advantages and Disadvantages of OS

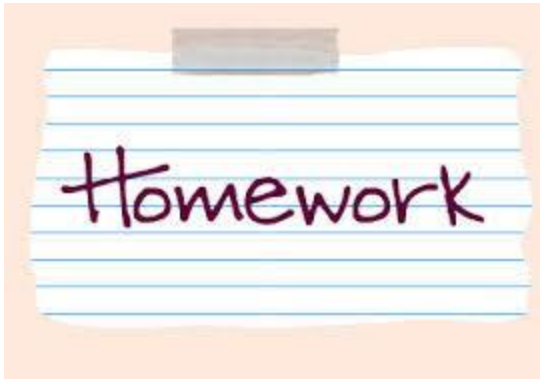
Q 1.What is primary OS?

Q 2. What is GUI ?

Q 3. What is MAC?

Q 4. Which is better OS?

Q 5. OS is software or Hardware?



Q 1. Write OS definition?

Q 2. Explain OS types?

Q 3. Explain shell?

Q 4. Explain kernel?

Q 5. Explain file system?

Q 6. what is windows ?

Q 7. Define GUI?