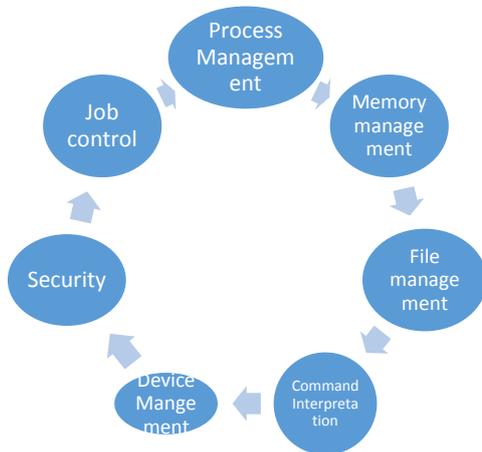# CH-1

OPERATING SYSTEM AND GUI-ROLE AND FUNCTION

Need of Operating Systems

The fundamental goal of a Computer System is to execute user programs and to make tasks easier. Various application programs along with hardware system are used to perform this work. Operating System is a software which manages and control the entire set of resources and effectively utilize every part of a computer.

The figure shows how OS acts as a medium between hardware unit and application programs.

Functions of Operating Systems

Process Management

This deals with management of the Central Processing Unit (CPU). The operating system takes care of the allotment of CPU time to different processes. When a process finishes its CPU processing after executing for the allotted time period, this is called scheduling.

Memory management

In a computer, both the CPU and the I/O devices interact with the memory. When a program needs to be executed it is loaded onto the main memory till the execution is completed. Thereafter that memory space is freed and is available for other programs. The common memory management techniques used by the operating system are Partitioning and Virtual Memory.

File Management

The operating System manages the files, folders and directory systems on a computer. Any data on a computer is stored in the form of files and the operating system keeps information about all of them using File Allocation Table (FAT).

Security

Security refers to providing a protection system to computer system resources such as CPU, memory, disk, software programs and most importantly data/information stored in the computer system. If a computer program is run by an unauthorized user, then he/she may cause severe damage to computer or data stored in it. So a computer system must be protected against unauthorized access, malicious access to system memory, viruses, worms etc.

Command Interpretation

A command interpreter is the part of a computer operating system that understands and executes commands that are entered interactively by a human being or from a program. In some operating systems, the command interpreter is called the shell.
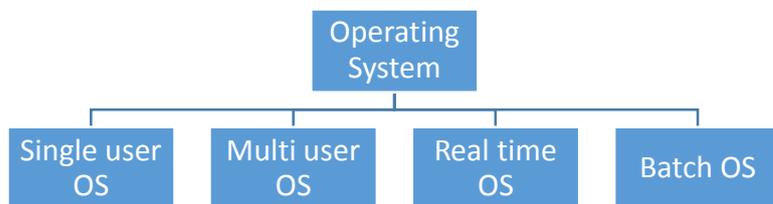
Device management

Device management in operating system implies the management of the I/O devices such as a keyboard, magnetic tape, disk, printer, microphone, USB ports, scanner and camcorder etc.as well as the supporting units like control channels.

Job Control

It is the process in which the user can communicate with the operating system for telling is what to do.

```
                    Operating
                     System
    ┌───────────┬────────────┬───────────┐
Single user   Multi user   Real time    Batch OS
   OS            OS            OS
```
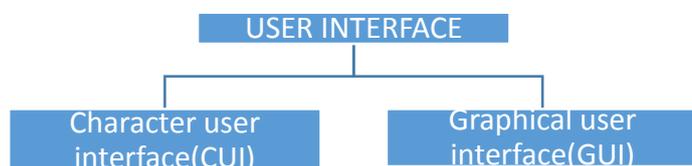
- **Single user OS**-- Single user operating system is also known as "Single Tasking Operating System", and single user operating system is designed specially for using on the home computers.

  Multi user OS-- A Multi-user operating system is a computer operating system which allows multiple users to access the single system with one operating system on it. It is generally used on large mainframe computers.
  Example: Linux, Unix, Windows 2000, Ubuntu, Mac OS etc.,

  Real time OS-- These types of OSs serves the real-time systems. The time interval required to process and respond to inputs is very small. This time interval is called **response time**.

  Batch OS-- This type of operating system does not interact with the computer directly. There is an operator which takes similar jobs having same requirement and group them into batches. It is the responsibility of operator to sort the jobs with similar needs.

USER INTERFACE-- A user interface (UI) is a conduit between human and computer interaction – the space where a user will interact with a computer or machine to complete tasks. The purpose of a UI is to enable a user to effectively control a computer or machine they are interacting with, and for feedback to be received in order to communicate effective completion of tasks.

```
                USER INTERFACE
        ┌───────────────┴───────────────┐
   Character user                  Graphical user
   interface(CUI)                  interface(GUI)
```

CUI—Character user interface or command line user interface, is a prompt used to interact with computer programs. It works by allowing the user to issue commands.e.q Ms-Dos, unix etc

GUI--A graphical user interface (GUI) is an interface through which a user interacts with electronic devices such as computers, hand-held devices and other appliances. This interface uses icons, menus and other visual indicator (graphics) representations to display information and related user controls, unlike text-based interfaces, where data and commands are in text. GUI representations are manipulated by a pointing device such as a mouse, trackball, stylus, or a finger on a touch screen.e.q Windows

MS WINDOWS 2010

It is the latest and most popularly used version of the windows operating system, introduced by Microsoft in 2015 for use on personal computer, laptop and notebook. Window is an operating system which enables the user to interact with the computer providing more ways to interact than typing .It is a set of programs that provides a user friendly platform (GUI) and helps to operate a computer.

Starting-up (Booting)

In computing, **booting** is the process of starting a computer. It can be initiated by hardware such as a button press, or by a software command. After it is switched on, a computer's central processing unit (CPU) has no software in its main memory, so some process must load software into memory before it can be executed. This may be done by hardware or firmware in the CPU, or by a separate processor in the computer system.

(i)In Windows 10 when we start the computer the loading wheel appear in the screen that means it preparing the start –up sequence.

(ii)Then you select your user account and type the password and press enter key.it will show your window screen.

All the icons are visible on the desktop and the window is ready to use.

The Start-Up List

It contains the list of programs, apps etc. Antivirus programs, Printer programs and Microsoft office are examples of this list.

Desktop and its components

The first screen appear on the computer screen is known as desktop and their components are icons, menus, taskbar quick launcher etc.