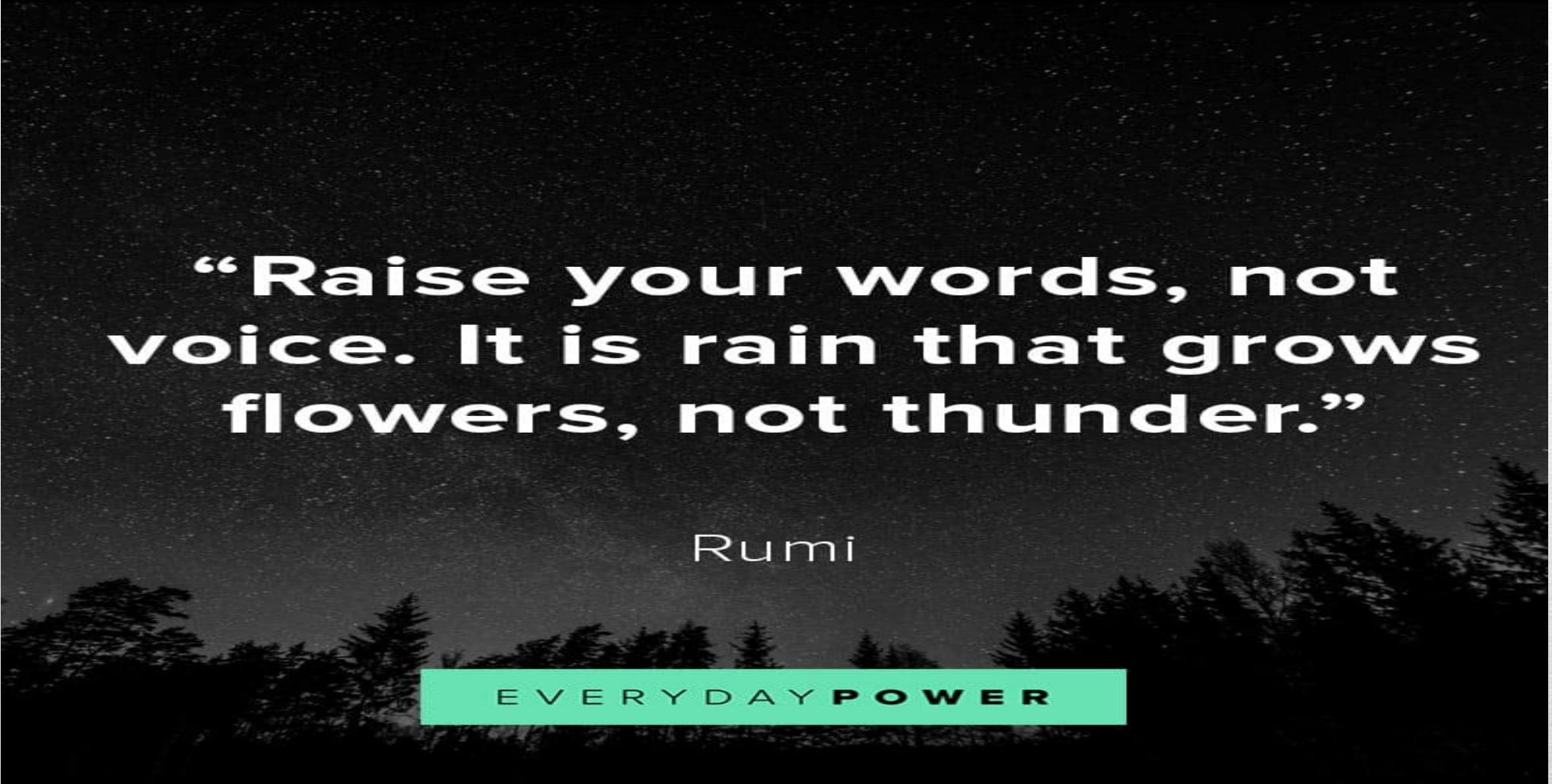


INTRODUCTION TO INFORMATION AND COMMUNICATION TECHNOLOGY



“Raise your words, not voice. It is rain that grows flowers, not thunder.”

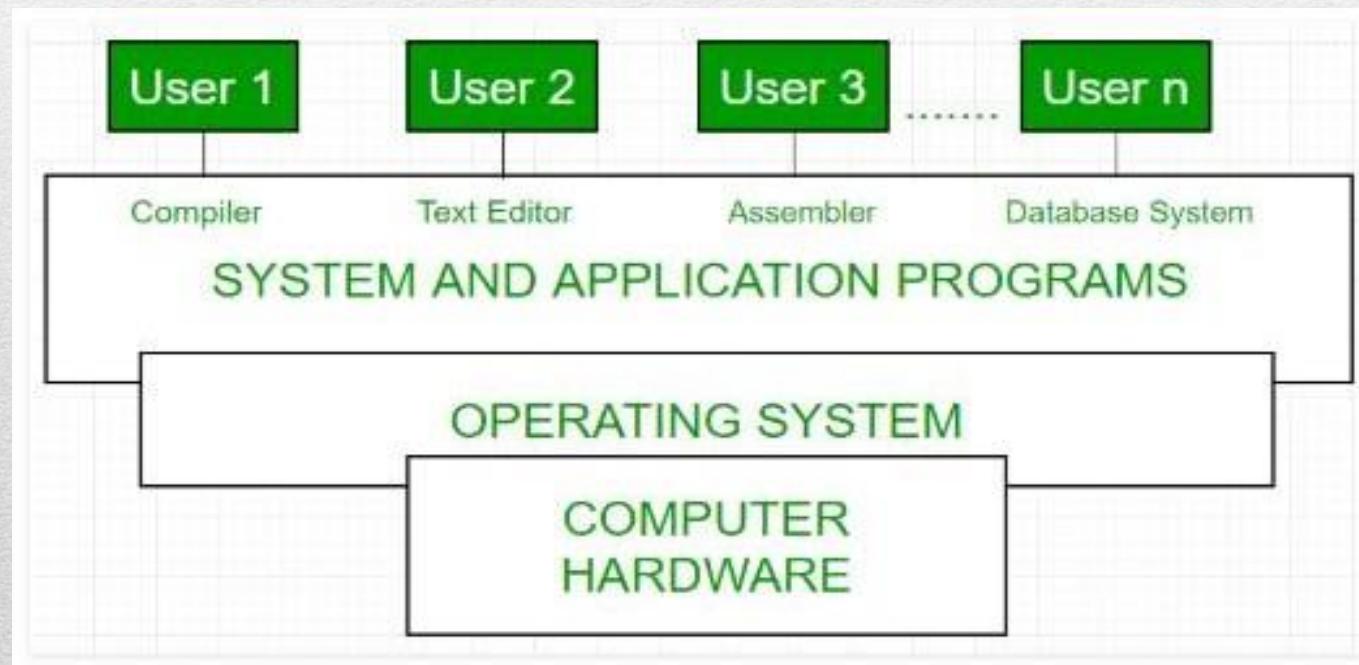
Rumi

EVERYDAY POWER

Starting Note...

Operating Systems

- It's a system software that allows a user to run other applications on a computing device and acts as an intermediary between a user of a computer and the computer hardware.



What do operating systems do?

- Allocation of resources
 - Memory management.
 - User View
 - Extended machine that hides the lower level details
 - System View
 - Resource allocator
 - Resource
 - Component of limited availability necessary for effective operation.
 - A resource is whatever any process needs to use to complete its task.
 - Memory , CPU, files, printer, data or any I/O devices , anything that is needed to complete tasks.
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Examples of Operating Systems

- Windows
- Linux
- Mac OS
- Ubuntu
- Android
- iOS



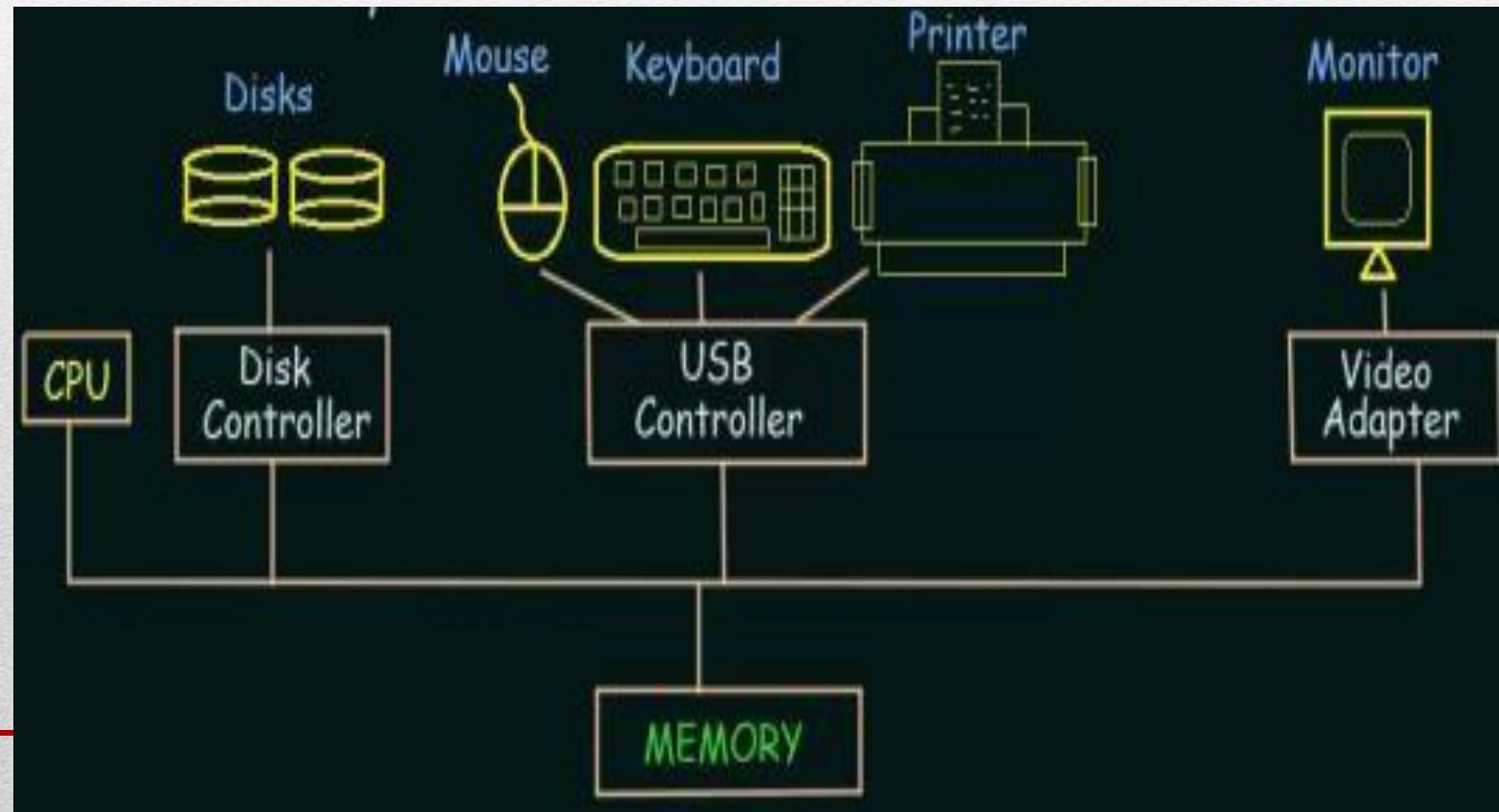
Goals of Operating System

- Operating System Goals
 - Execute user programs.
 - Make solving user problems easier.
 - Make the computer system convenient to use.
 - Use the computer hardware and resources in an efficient manner.



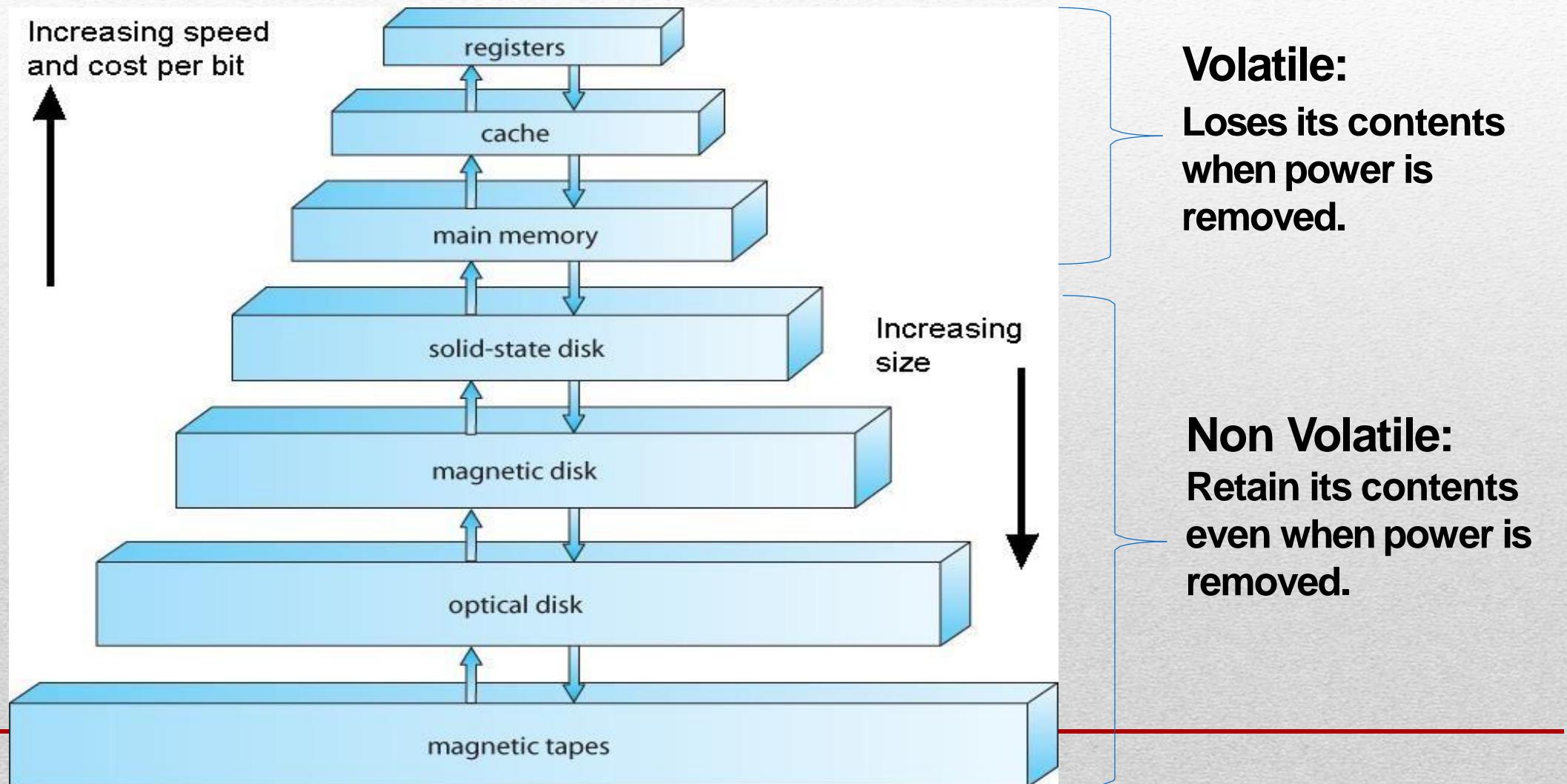
Computer System Operation

- A modern general purpose computer consists of one or more CPUs and a number of device controllers connected through a common bus that provides access to a shared memory.



- Each device controller is in charge of specific type of device.
 - The CPU and controllers can execute concurrently (at the same time)competing for memory cycles.
 - Memory controller synchronize access to the memory.
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Storage Structure



Types of Operating System

- Batch Operating System
 - Multitasking OS
 - Multiprogramming OS
 - Multiprocessing OS
 - Distributed OS
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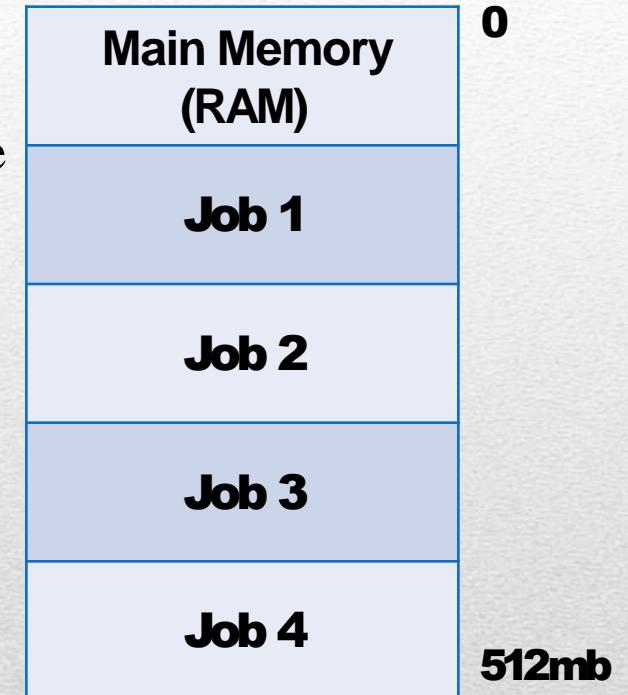
Batch Operating System

- The users of a batch operating system do not interact with the computer directly.
- Each user prepares his job on an off-line device like punch cards and submits it to the computer operator.
- System will execute the jobs one by one.



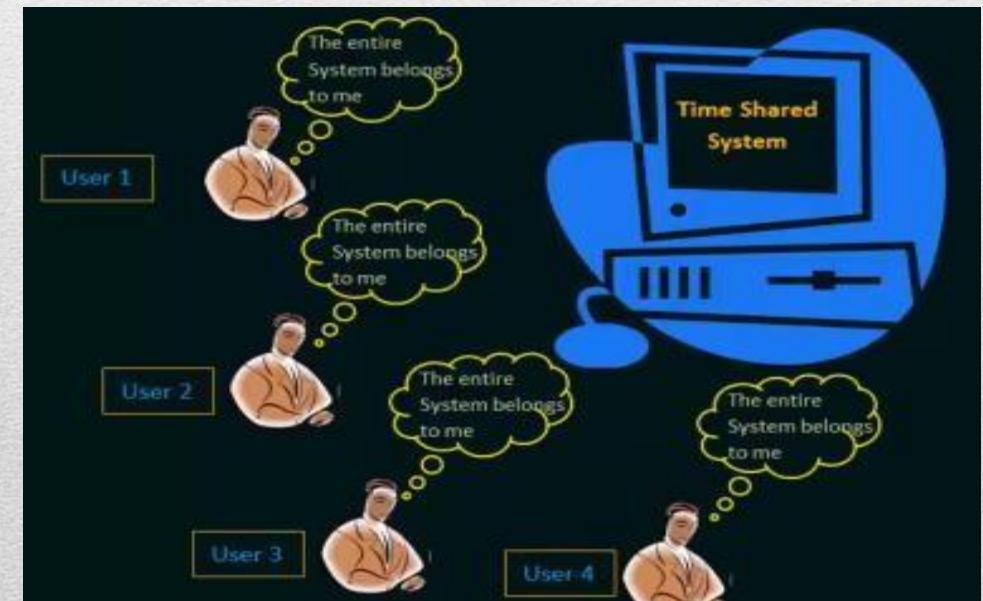
Multiprogramming

- The capability of running multiple programs by the CPU.
- Multiprogramming increases the CPU utilization by organizing jobs (code and data) so that the CPU always has one to execute.



Multitasking (Time Sharing)

- CPU executes multiple jobs by switching among them.
- Very fast switching.
- A time sharing operating system allows many users to share the computer simultaneously.



- Just to make it easy to remember, both multiprogramming and multitasking operating systems are **(CPU) time sharing** systems. However, while in multiprogramming **(older OSs)** one program as a whole keeps running until it blocks, in multitasking **(modern OSs)** time sharing is best manifested because each running process takes only a fair quantum of the CPU time.

Things to remember!

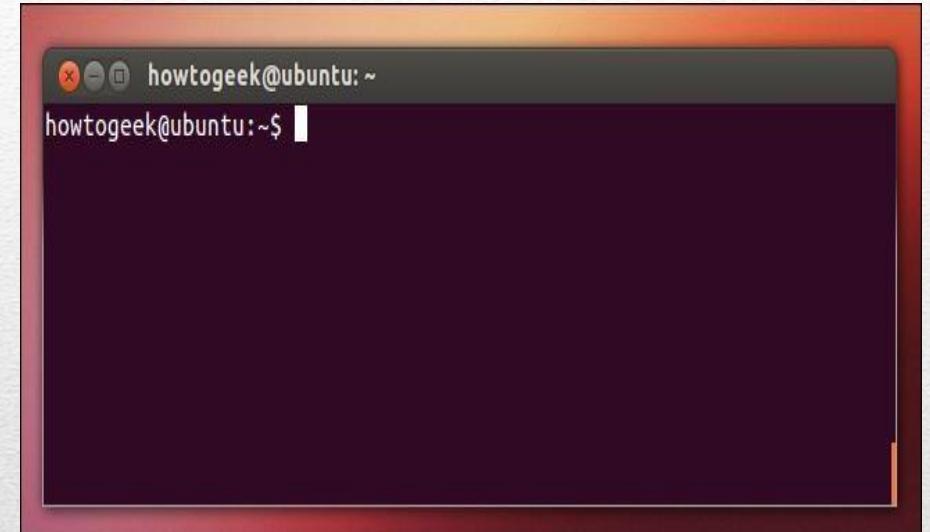
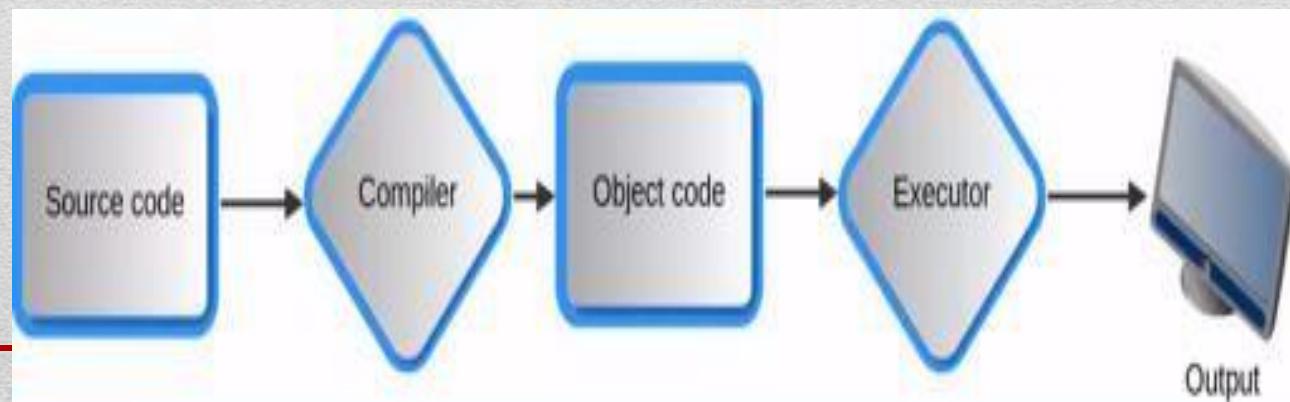
Multiprocessing

- **Multiprocessing** is the use of two or more central processing units (CPUs) within a single computer system.
- The term also refers to the ability of a system to support more than one processor or the ability to allocate tasks between them.

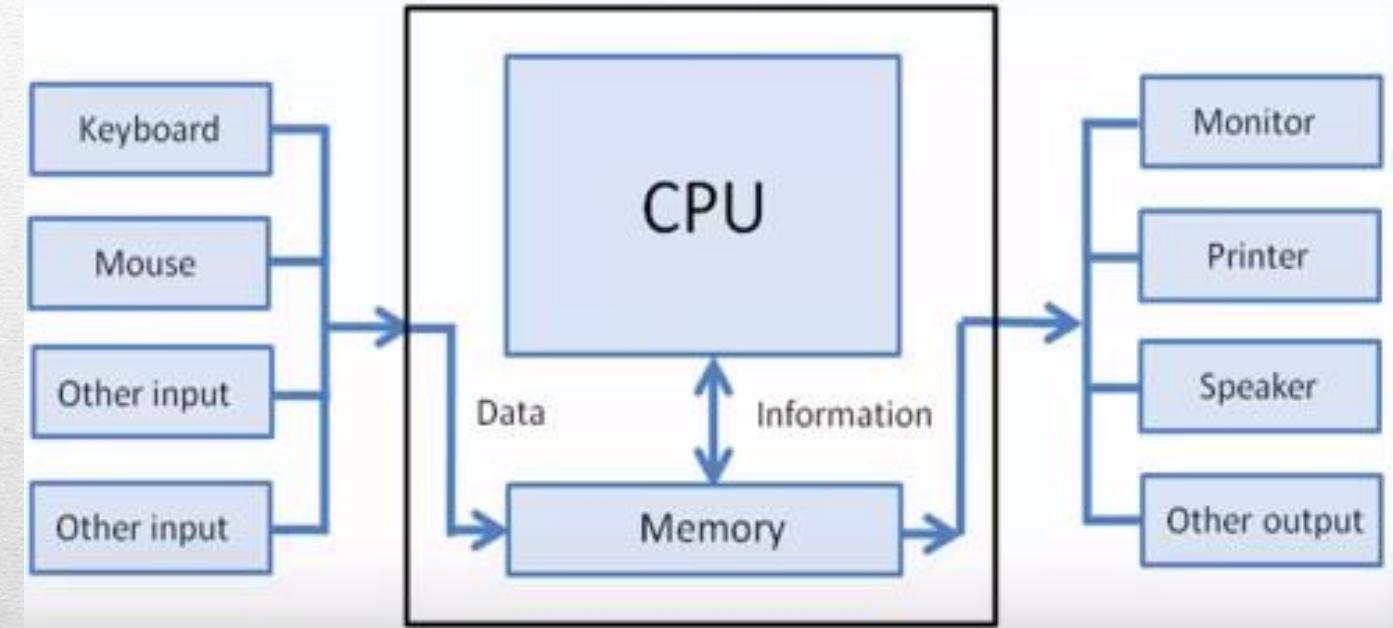


Operating System Services

- User Interface
 - Allows the user to interact with the computer.
 - Command line interface (Terminal)
 - Graphical user interface
- Program Execution
 - Load the program into memory
 - Execute the program.



- I/O Operations
- File system manipulation
 - Creation, deletion, search
- Resource Allocation



BIOS(Basic Input Output System)

- A firmware designed to be executed first when computer is turned on
- Function Is to identify , test and initialize system devices like hard disk .
- BIOS sets the machine in a state so that the operating system can be loaded , executed and given control of a PC.



Important Terms and Definitions

- Bootloader
 - Called by BIOS
 - Initializes the OS during start up.
 - It is stored in the ROM.
 - It must know how to load the OS and start executing that system.
 - It must locate and load OS kernel into memory.
 - Process
 - In computing, a **process** is an instance of a computer program that is being executed.
It contains the program code and its activity.
 - Kernel
 - A **kernel** is the central part of an operating system.
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