



Operating System Basics

- Introduction to Operating system
- Functions of an Operating Systems
- Classification of Operating Systems
- Basic introduction to DOS, UNIX/LINUX OS, Windows XP.



What is an Operating System?

- A system software that acts as an intermediary between a user of a computer and the computer hardware.
- An **abstraction** of the hardware for all the (user) processes
 - Hide the complexity of the underlying hardware and give the user a better view of the computer



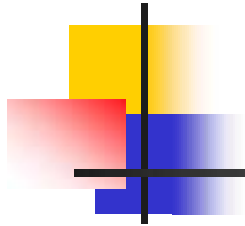
Why should I study Operating Systems?

- Need to understand interaction between the hardware and applications
 - New applications, new hardware..
 - Inherent aspect of society today
- Need to understand basic principles in the design of computer systems
 - efficient resource management, security, flexibility
- Increasing need for specialized operating systems
 - e.g. embedded operating systems for devices - cell phones, sensors and controllers
 - real-time operating systems - aircraft control, multimedia services



Goals of an Operating System

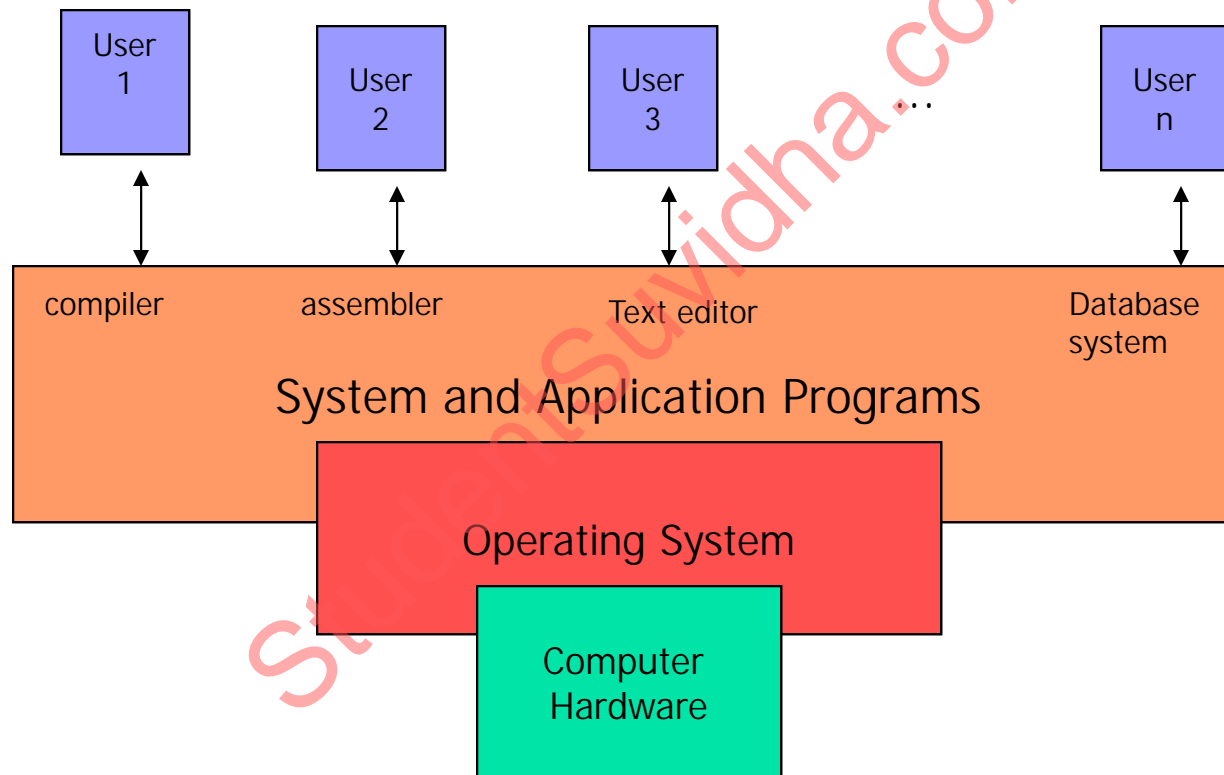
- Simplify the execution of user programs and make solving user problems easier.
- Use computer hardware efficiently.
 - Allow sharing of hardware and software resources.
- Make application software portable and versatile.
- Provide isolation, security and protection among user programs.
- Manage the resources of a computer system.
- Improve overall system reliability
 - error confinement, fault tolerance, reconfiguration.
 - Make the computer system convenient to use.



Computer System Components

1. Hardware – provides basic computing resources (CPU, memory, I/O devices).
2. Operating system – controls and coordinates the use of the hardware among the various application programs for the various users.
3. Applications programs – define the ways in which the system resources are used to solve the computing problems of the users (compilers, database systems, video games, business programs).
4. Users (people, machines, other computers).

Abstract View of System





Operating System Definitions

- Resource allocator – manages and allocates resources.
- Control program – controls the execution of user programs and operations of I/O devices .
- Kernel – the one program running at all times (all else being application programs).



Basic functions of the operating system

- **Device management/Resource control**
Controls peripheral devices connected to the computer
- **File management**
Transfers files between main memory and secondary storage, file folders, allocates the secondary storage space, and provides file protection and recovery.
- **Memory management**
Allocates the use of random access memory (RAM) to requesting processes.
- **Interface platform**
Allows the computer to run other applications.



Basic functions of the operating system (Contd....)

- **Process Management**

A program in execution is called a process. Process management manages the processes submitted to a system in a such a way so as to minimize idle time of processor.

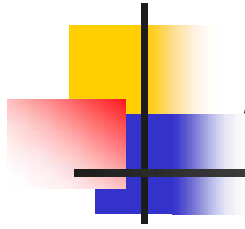
- **Error Detection**

CPU and memory hardware: such as a memory error or power failure.

I/O devices: such as tape connection failure or lack of paper in printer.

- **Security**

- User authentication
- Access control
- cryptography



Assignment 1

What do you mean by operating system?
What are the basic responsibilities of OS?