IN2311:Operating systems

Roshani Wijesuriya

Course logistics and details

Textbook:

- Operating System Concepts –Eighth Edition Silberschatzand Galvin, Addison-Wesley Inc.

Alternate Book

- Principles of Operating Systems, L.F. Bic and A.C. Shaw, PrenticeHall/Pearson Education, 2003. ISBN 0130266116.

Course logistics and details

Assignments (40%)

2

Tests (60%)

1

Course Outline

- Chapter 1: Introduction to Operating Systems
- Chapter 2: Operating-System Structures
- Chapter 3: Introduction to Processes
- Chapter 4: Threads
- Chapter 5: CPU Scheduling
- Chapter 6: Process Synchronization
- Chapter 7: Deadlocks
- Chapter 8: Memory Management
- Chapter 9: File Systems and Storage Management
- Chapter 10: Protection and Security

Chapter 01:Operating System Introduction

Content

- What is an operating System?
- Evolution of Operating Systems
- Functionalities of Operating Systems
- List of Common Operating Systems
- Conceptual View of Computer System
- Types of Operating Systems

What is an Operating System?

- A program that acts as an intermediary between a user of a computer and the computer hardware.

- Operating system goals:

➢ *Execute user programs and make solving user problems easier*

➢ *Make the computer system convenient to use*

➢ *Use the computer hardware in an efficient manner*

History of the Operating System

The operating system has been evolving through the years.

- When the first electronic computer was developed in 1940, it was created without any operating system.
- The first operating system (OS) was created in the early 1950s and was known as GMOS. General Motors has developed OS for the IBM computer.
- During the late 1960s, operating system designers were very capable of developing a new operating system that could simultaneously perform multiple tasks in a single computer program called multiprogramming.
- The fourth generation of operating systems is related to the development of the personal computer. (1980 - Present Day)

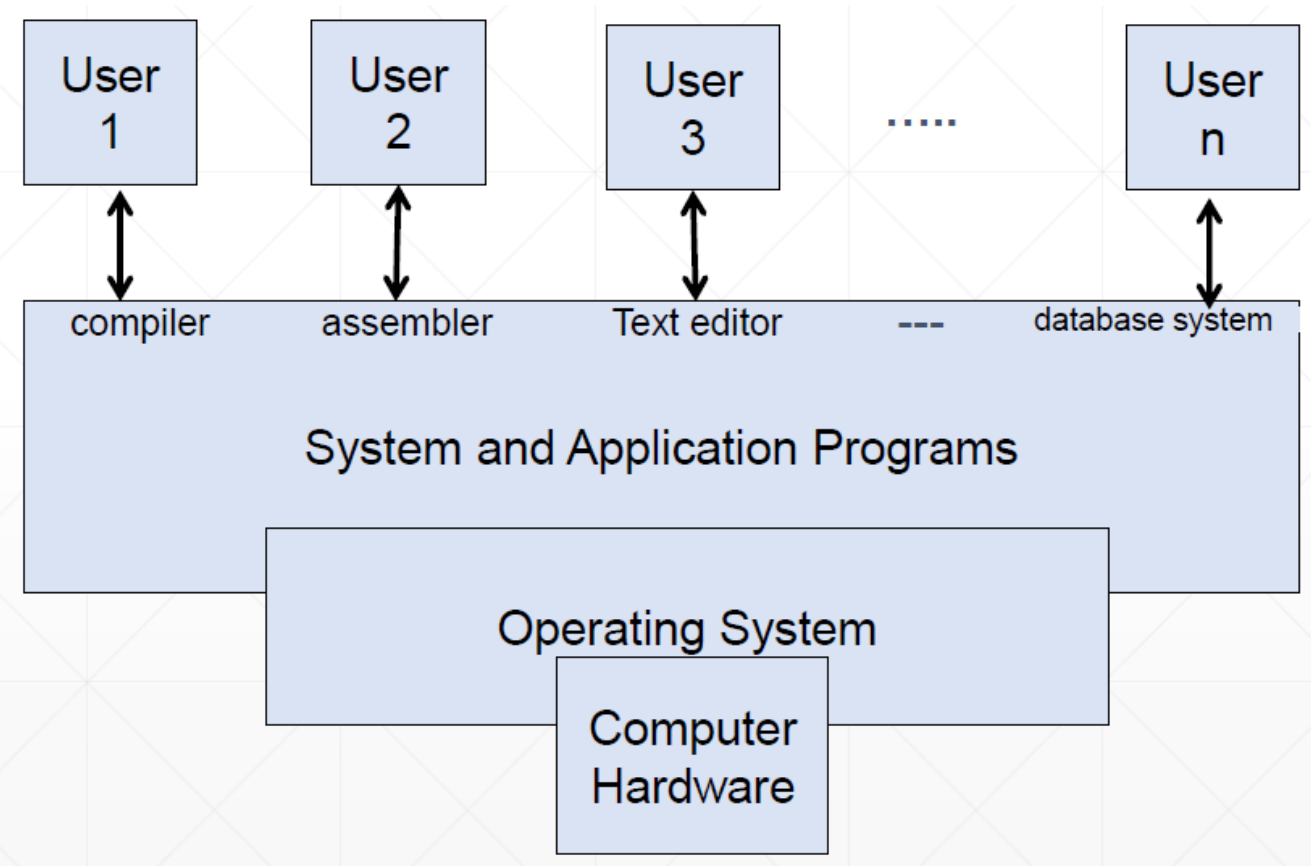
List of common Operating Systems

- Windows OS
- macOS
- Linux
- Unix
- Android
- iOS

Functionalities of Operating System

- **Memory Management:** Refers to the management of primary memory. The operating system has to keep track of how much memory has been used and by whom.
- **Processor Management:** In multiprogramming environment, the OS decides which process gets the processor when and for how much time.
- **Device Management:** An Operating System manages device communication via their respective drivers.
- **File Management:** A file system is normally organized into directories for easy navigation and usage.
- **Security:** By means of password and similar other techniques, it prevents unauthorized access to programs and data.
- **Control over system performance:** Recording delays between request for a service and response from the system.
- **Job accounting:** Keeping track of time and resources used by various jobs and users.
- **Error detecting aids:** Production of dumps, traces, error messages, and other debugging and error detecting aids.
- **Coordination between other softwares and users:** Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

Conceptual View of Computer System

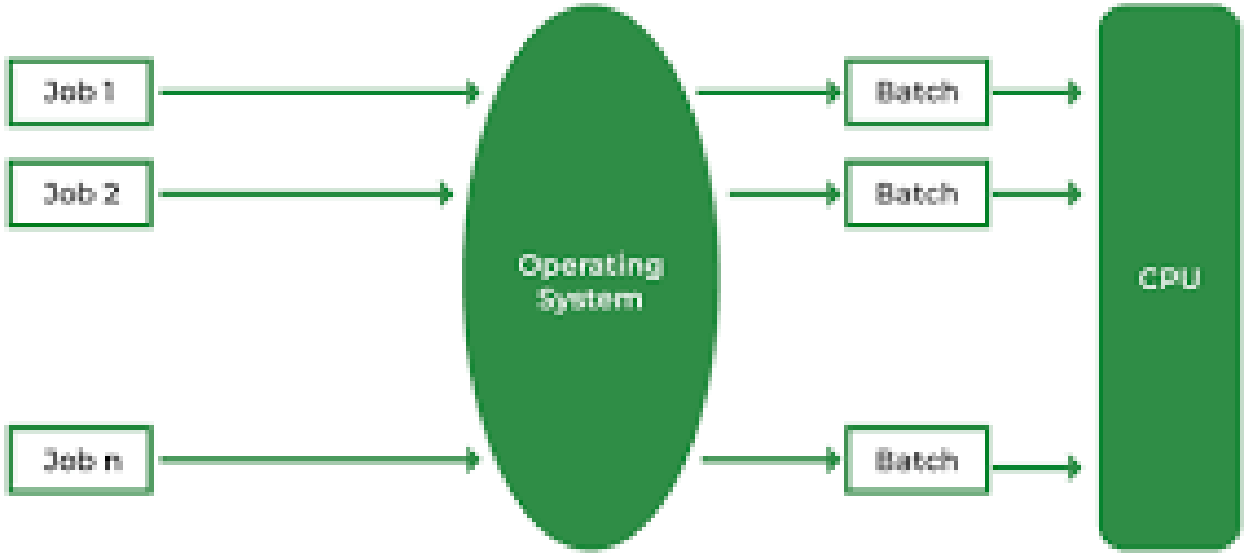


Program, job, and process

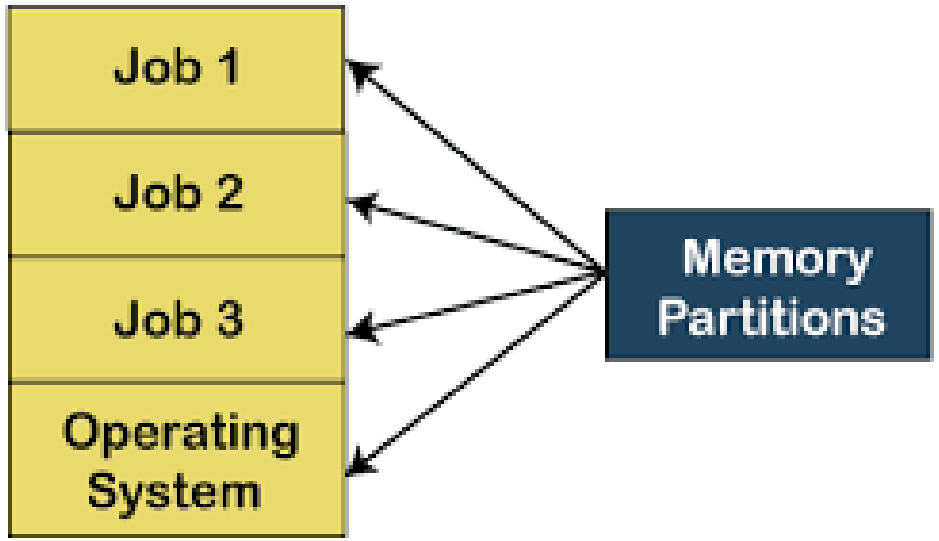
- A *program* is non-active set of instructions stored on disk.
- A program becomes a *job* from the moment it is selected for execution until it has finished running and becomes a program again.
- A *process* is a program in execution. It is a program that has started but has not finished.

Types of Operating Systems

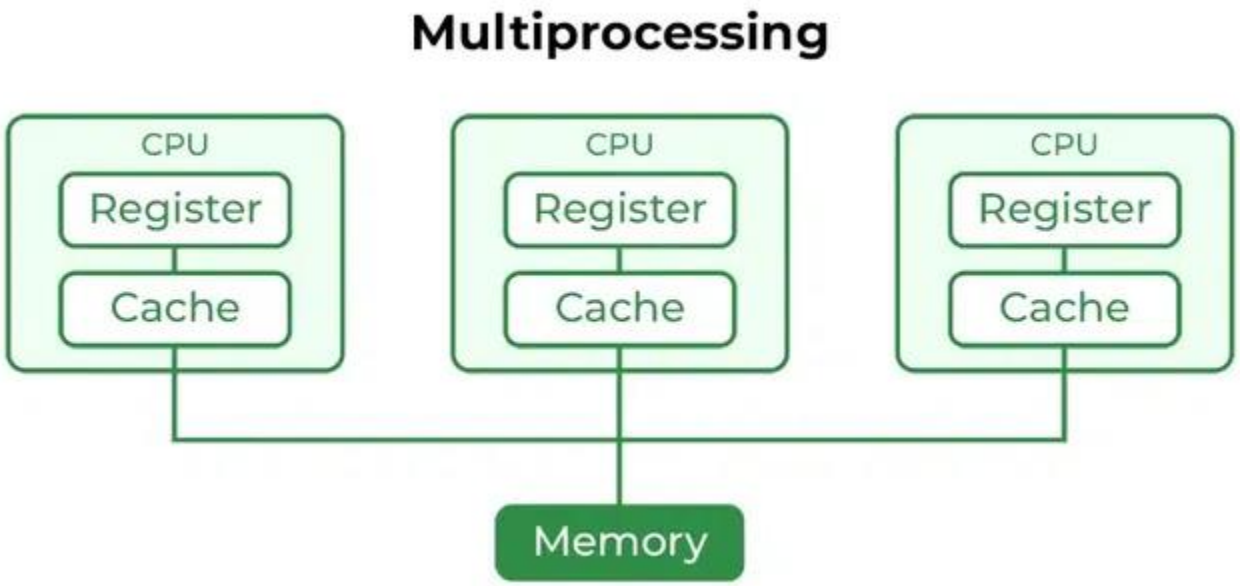
1. Batch Operating System



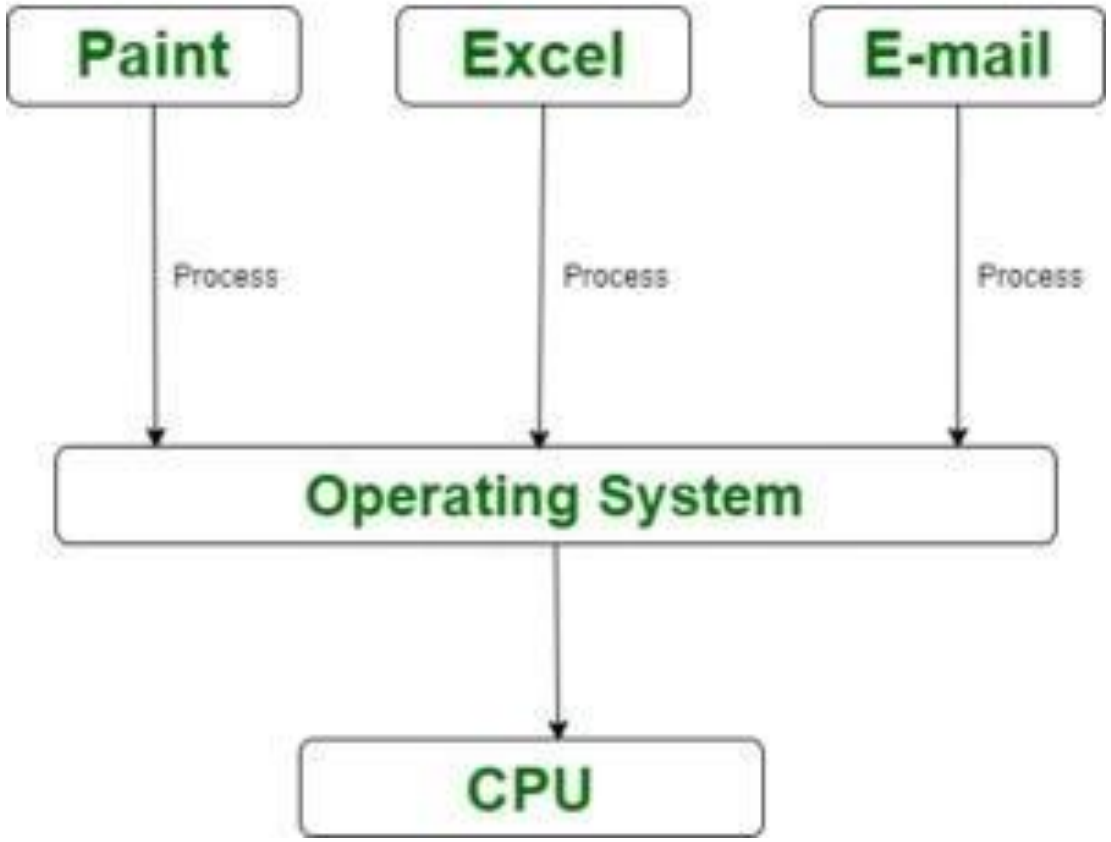
2. Multi-Programming Operating System



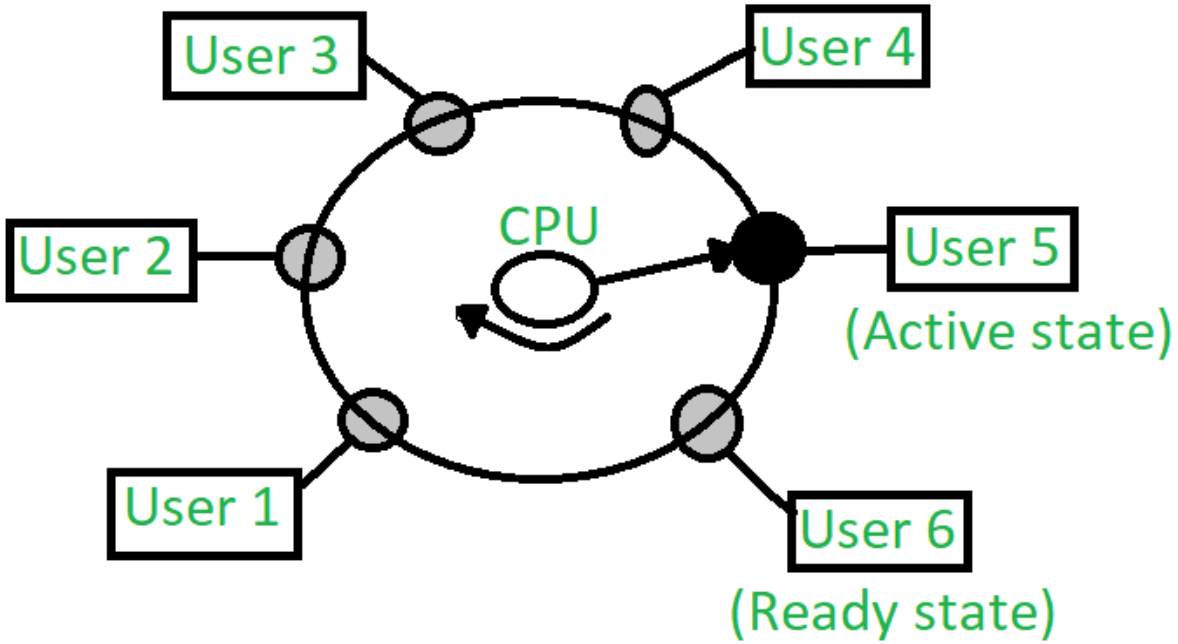
3. Multi-Processing Operating System



4. Multi-Tasking Operating System



5. Time-Sharing Operating Systems



Conclusion

Thank you