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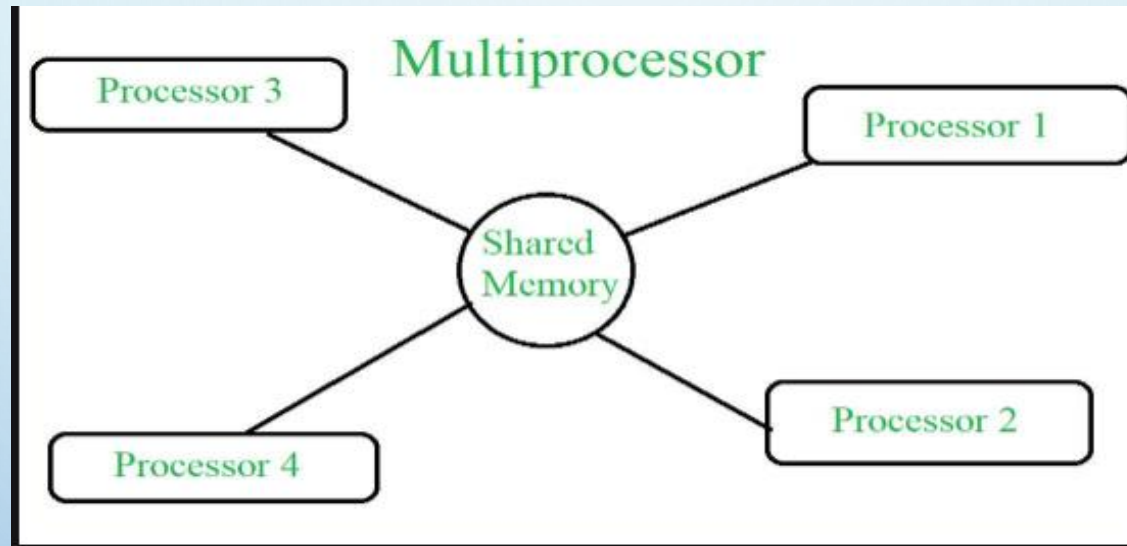
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Md. Shakil Rana  
Student, Department  
of CSE  
ID: 41230201235

## Today's Topic



**Multiprocessor System**

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# Introduction

A **Multiprocessor System** is a computer system with **two or more processors** that share physical memory and work together to perform tasks.





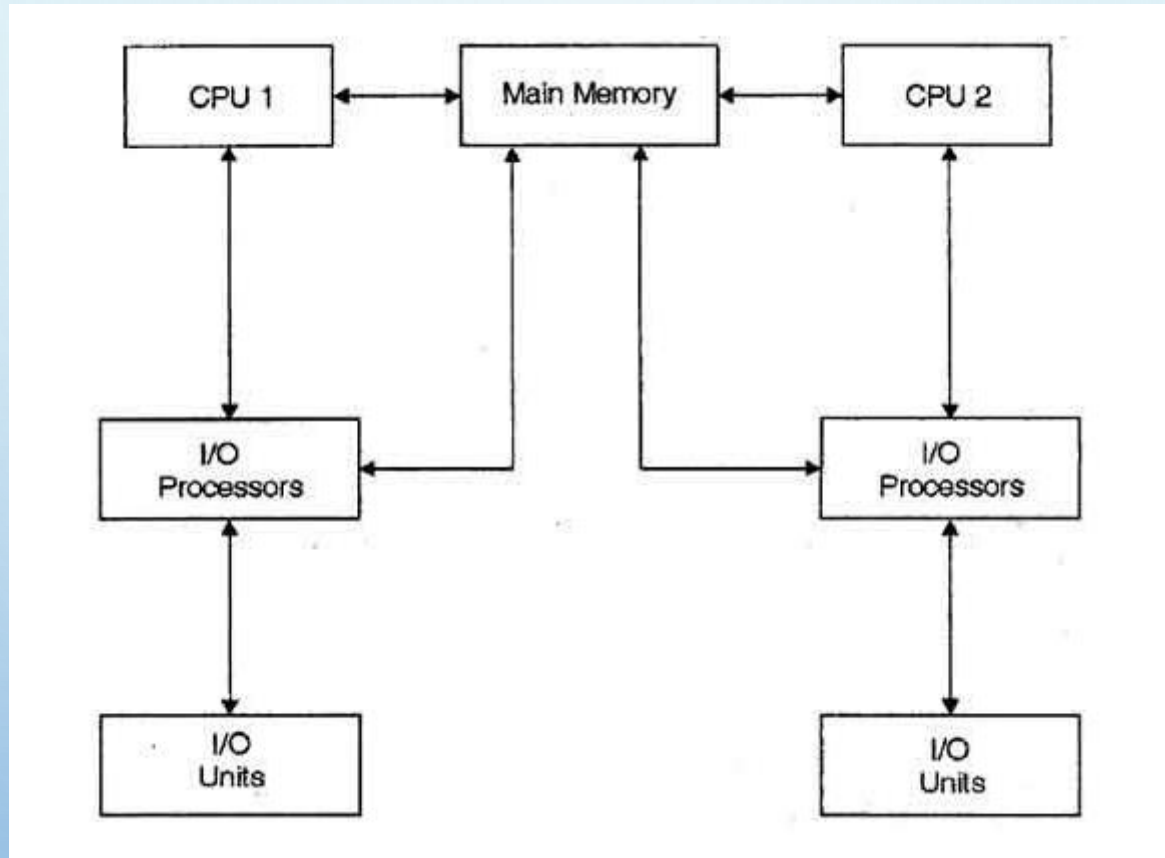
## Key Objectives

- ❖ Increase processing power
  - ❖ Increase system performance
  - ❖ Enhance reliability
  - ❖ Provide better throughput
  - ❖ Resource utilization
  - ❖ Fault tolerance.
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## Components of Multiprocessor System

- Shared Memory
- Multiple Processor
- Interconnection network

## Working Process

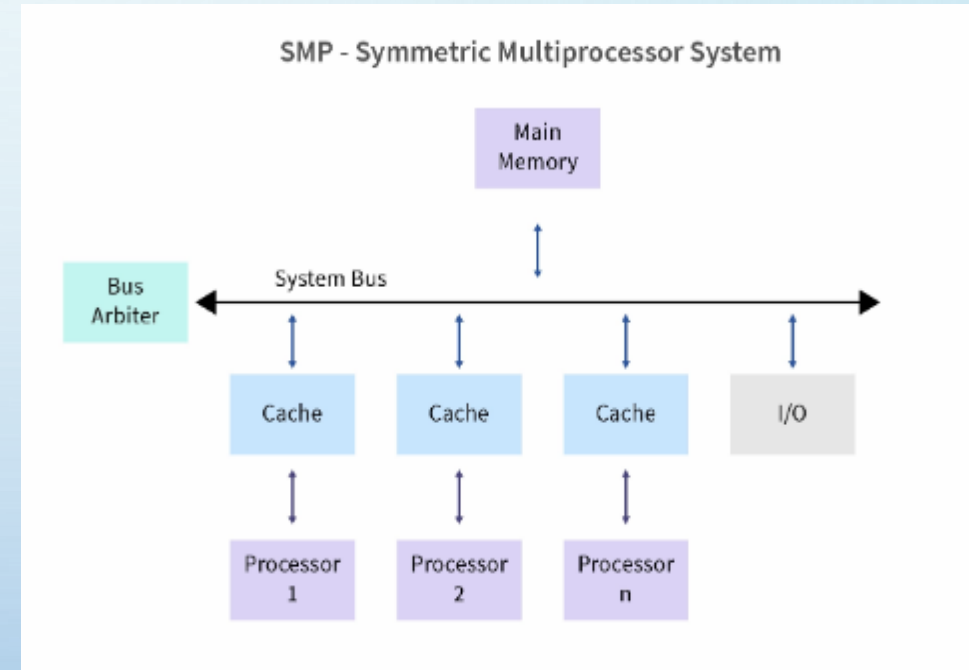




## Types of Multiprocessor Systems

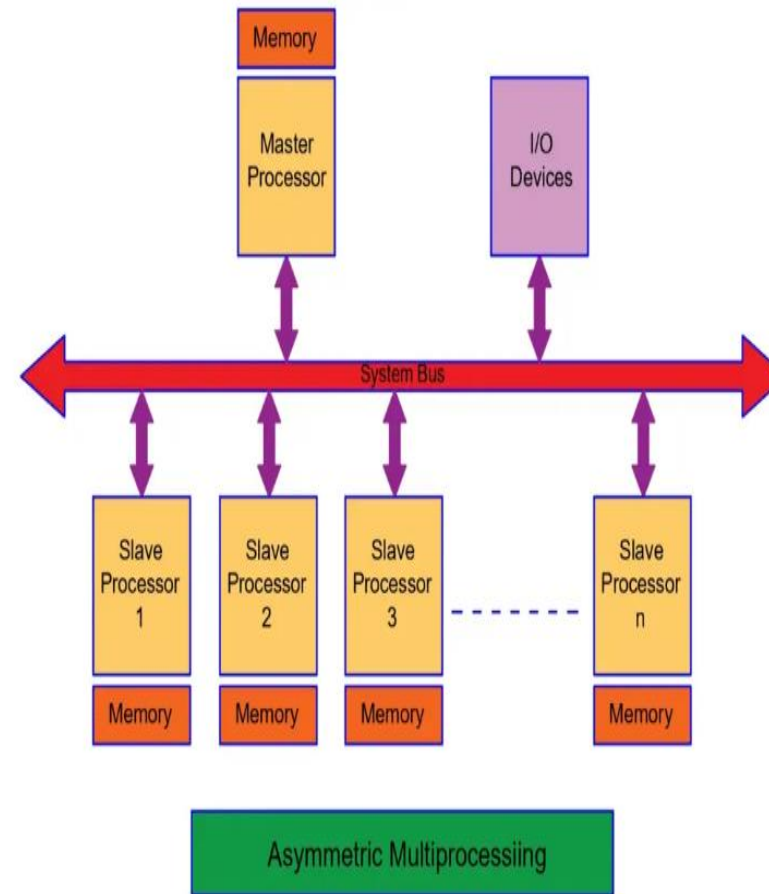
### ❑ Symmetric Multiprocessing (SMP)

- All processors share a common memory and are controlled by a single OS.
- Each processor performs all tasks (including OS functions and user processes).



## ❑ Asymmetric Multiprocessing (AMP)



1. Each processor is assigned a specific task.
2. One processor controls the system while others follow instructions.





## Advantages

- **High Performance:** Tasks are divided among multiple CPUs, speeding up execution.
- **Reliability:** If one processor fails, others can take over.
- **Scalability:** Easy to add more processors to boost power.




## Disadvantages

**Cost:** More expensive due to additional hardware.

**Complexity:** Requires sophisticated software for coordination and synchronization.

**Power Consumption:** Higher energy usage compared to single-processor systems.



## Applications

- Servers and data centers
- High-performance computing (HPC)
- Real-time systems (e.g., automotive and aerospace)
- Cloud computing and AI workloads



## Conclusion

- Multiprocessor systems play a crucial role in modern computing by providing speed, efficiency, and reliability.
- As demands for computing power grow, multiprocessor architectures continue to evolve in both hardware and software.



**Thank you all**