SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

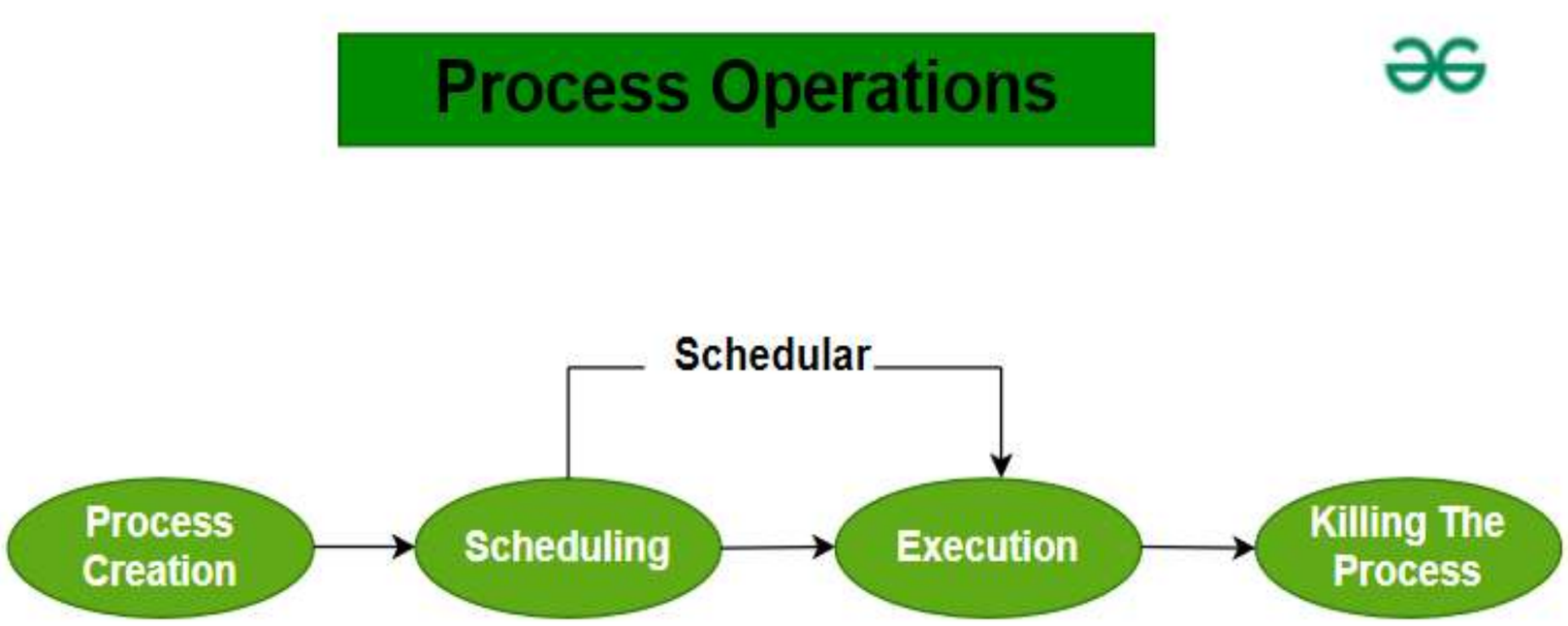
UNIT 4 : EMBEDDED OPERATING SYSTEM AND MODELING

TOPIC 4.1: EMBEDDED OPERATING SYSTEM PROCESS MANAGEMENT

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

Process Management

- Program under execution is said to be a process
- Operating System managing the process is said to be as process management



EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

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

Process Management in OS

- A Program does nothing unless its instructions are executed by a CPU
- A program in execution is called a process
- In order to accomplish its task, process needs the computer resources
- There may exist more than one process in the system which may require the same resource at the same time.

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

Why do we need process management in operating system?

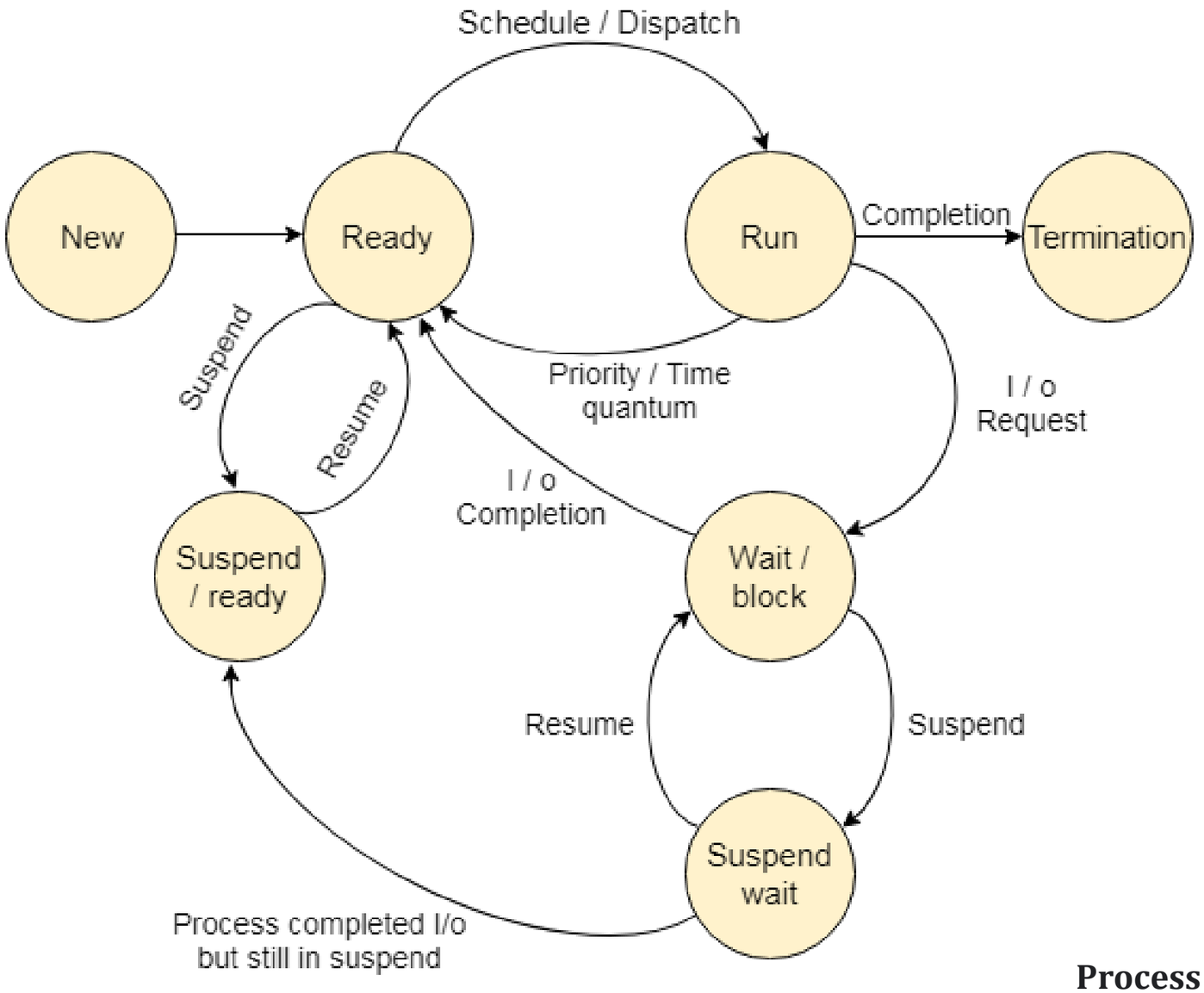
Process Management

- The operating systems **allocate resources that allow the process to exchange information**
- It synchronizes among processes and safeguards the resources of other processes
- The operating system manages the running processes in the system and performs tasks like scheduling and resource allocation.

Basically there are two types of process:

1. Independent process.
2. Cooperating process.

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT



Process States

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

New State

- When a program in secondary memory is started for execution, the process is said to be in a new state

Ready State

- After being loaded into the main memory and ready for execution, a process transitions from a new to a ready state
- The process will now be in the ready state, waiting for the processor to execute it
- Many processes may be in the ready stage in a multiprogramming environment

Run State

- After being allotted the CPU for execution, a process passes from the ready state to the run state

Terminate State

- When a process's execution is finished, it goes from the run state to the terminate state
- The operating system deletes the process control box (or PCB) after it enters the terminate state.

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

Block or Wait State

- If a process requires an Input/Output operation or a blocked resource during execution, it changes from run to block or the wait state
- The process advances to the ready state after the I/O operation is completed or the resource becomes available

Suspend Ready State

- If a process with a higher priority needs to be executed while the main memory is full, the process goes from ready to suspend ready state
- Moving a lower-priority process from the ready state to the suspend ready state frees up space in the ready state for a higher-priority process.
- Until the main memory becomes available, the process stays in the suspend-ready state
- The process is brought to its ready state when the main memory becomes accessible.

EMBEDDED OPERATING SYSTEM
PROCESS MANAGEMENT

Suspend Wait State

- If a process with a higher priority needs to be executed while the main memory is full, the process goes from the wait state to the suspend wait state
- Moving a lower-priority process from the wait state to the suspend wait state frees up space in the ready state for a higher-priority process.
- The process gets moved to the suspend-ready state once the resource becomes accessible
- The process is shifted to the ready state once the main memory is available.

THANK YOU