SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)
COIMBATORE-35
Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

19EEE305 / EMBEDDED SYSTEMS
III YEAR / VI SEMESTER

UNIT-IV: RTOS BASED EMBEDDED SYSTEM DESIGN

KERNAL ARCHITECTURE

KERNAL ARCHITECTURE / TASK

- **Kernel Functions:** File management, data transfer between the file system , hardware management , memory management and also the control of CPU time.
- **Kernel Objects :** The various kernel objects are Tasks, Task Scheduler, Interrupt Service Routines, Semaphores, Mutexes, Mailboxes, Message Queues, Pipes, Event Registers, Signals and Timers.

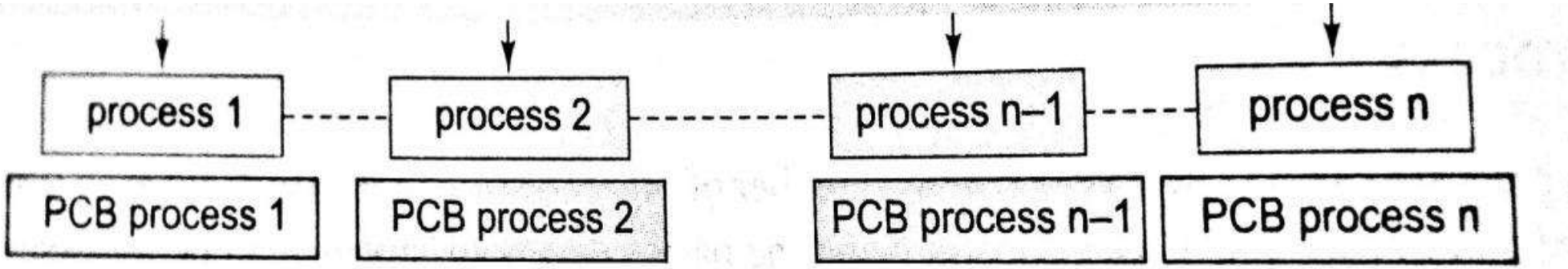
TASK: A task is a basic unit or atomic unit of execution that can be scheduled by an RTOS to use the system resources.

- **Simple Task (S-task):** A simple task is one which has no synchronization point
- **Complex Task (C-Task):** A task is called a complex task (C-Task) if it contains a blocking synchronization statement

PROCESS /THREAD/ TASK

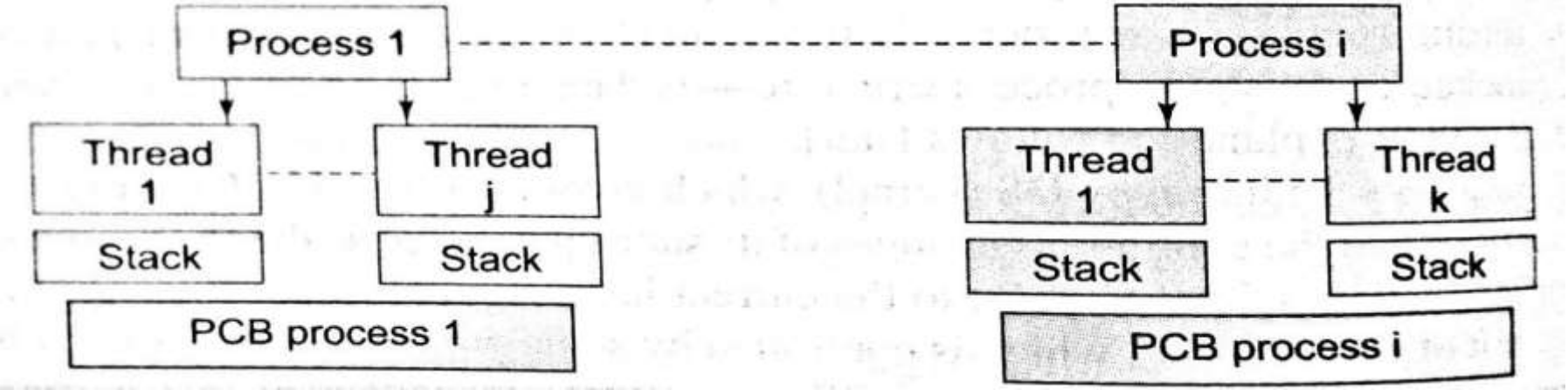
Process is defined as a computational unit that processes on a CPU and whose state changes under the control of kernel of an OS.

It has a state ,which at an instance defines by the process status(running, blocked or finished),process structure –its data, objects and resources and process control block.



PROCESS /THREAD/ TASK

A thread is a process or sub process within a process that has its own PC, its own SP and stack ,its own priority and its own variables that load into the processor registers on context switching and is processed concurrently along with other threads.



PROCESS /THREAD/ TASK

Task is defined as an embedded program computational unit that runs on a CPU under the state-control of kernel of an OS. It has a state, which at an instance defines by status (running, blocked or finished),structure – its data, objects and resources and control block.

TASK STATES

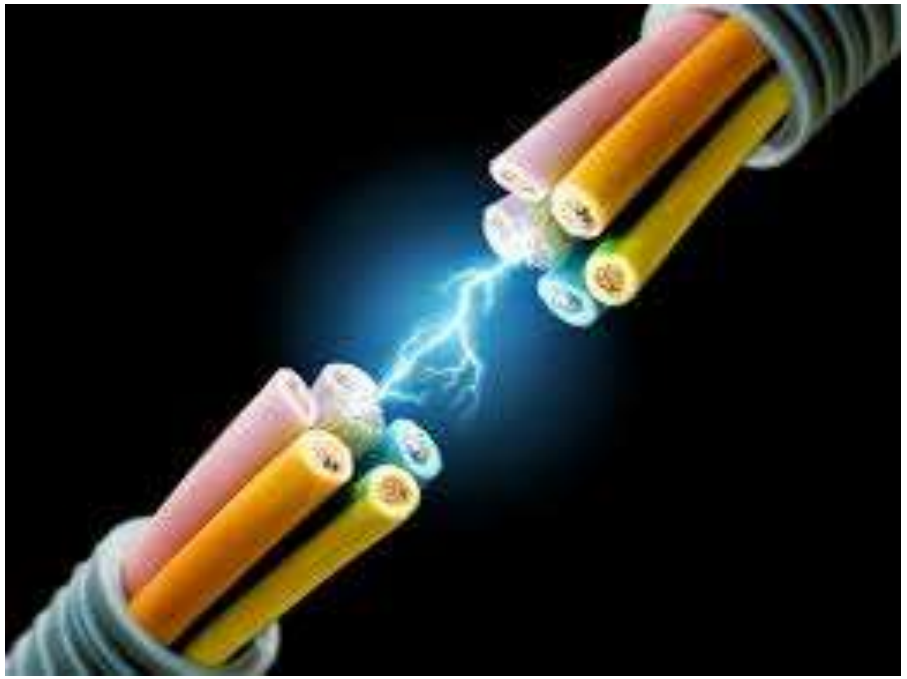
Creation of a Task:

A task is characterized by the parameters like task name , its priority , stack size and operating system options .To create a task these parameters must be specified.

Task States:

- At any instant of time a task can be in one of the following states :
- (i) Dormant
- (ii).Ready
- (iii).Running
- (iv).Blocked.
- When a task is first created , it is in the dormant task .When it is added to RTOS for scheduling ,it is a ready task. If the input or a resource is not available ,the task gets blocked. If no task is ready to run , RTOS is Idle.

RECAP….



…THANK YOU