Link: <http://www.studytonight.com/operating-system/cpu-scheduling>

**Topic: CPU Scheduler**

Under existing content **add** the following contents:

Whenever the CPU becomes idle, the operating system must select one of the processes in the ready queue to be executed. The selection process is carried out by the **short-term scheduler** (or CPU scheduler). The scheduler selects from among the processes in memory that are ready to execute, and allocates the CPU to one of them.

New sub topic after CPU scheduling:

**Types of CPU Scheduling:**

CPU scheduling decisions may take place under the following **four** circumstances:

1. When a process switches from the **running** state to the **waiting** state (for I/O request or invocation of wait for the termination of one of the child processes).
2. When a process switches from the **running** state to the **ready** state (for example, when an interrupt occurs).
3. When a process switches from the **waiting** state to the **ready** state (for example, completion of I/O).
4. When a process **terminates**.

In circumstances 1 and 4, there is no choice in terms of scheduling. A new process (if one exists in the ready queue) must be selected for execution. There is a choice, however in circumstances 2 and 3.

When Scheduling takes place only under circumstances 1 and 4, we say the scheduling scheme is **non-preemptive**; otherwise the scheduling scheme is **preemptive.**

**Non-preemptive Scheduling:**

Under non-preemptive scheduling, once the CPU has been allocated to a process, the process keeps the CPU until it releases the CPU either by terminating or by switching to the waiting state.

This scheduling method is used by the Microsoft Windows 3.1 and by the Apple Macintosh operating systems.

It is the only method that can be used on certain hardware platforms, because It does not require the special hardware (for example: a timer) needed for preemptive scheduling.

**Preemptive Scheduling:**

In this type of Scheduling, the tasks are usually assigned with priorities. At times it is necessary to run a certain task that has a higher priority before another task although it is running. Therefore, the running task is interrupted for some time and resumed later when the priority task has finished its execution.