

ASSIGNMENT-2

REAL TIME SCHEDULING

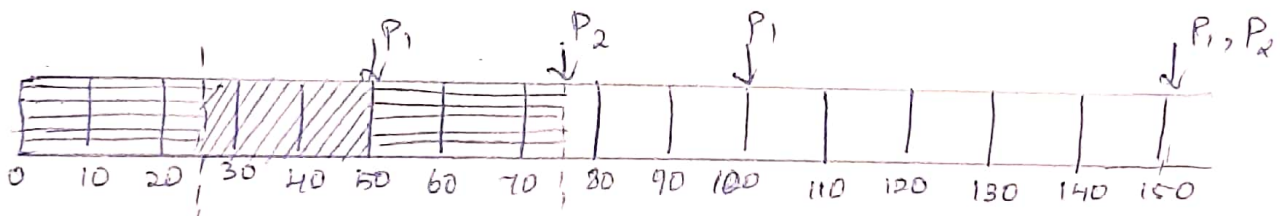
15-03-2021

Consider two processes P_1 & P_2 where $P_1 = 50, t_1 = 25$,
 $P_2 = 75$ & $t_2 = 30$

- a) Can these two processes be scheduled using rate-monotonic scheduling? Illustrate your answer with a Gantt chart?
- b) Illustrate the scheduling of these two processes using Earliest-Deadline-First (EDF) scheduling

P_1  P_2 

- a) RATE-MONOTONIC SCHEDULING:



Given, P_1, P_2 $P_1 = 50, t_1 = 25$ $P_2 = 75, t_2 = 30$

As, P_1 has time period 25ms, Rate-monotonic scheduling would assign process P_1 a higher priority (as it has shorter period).

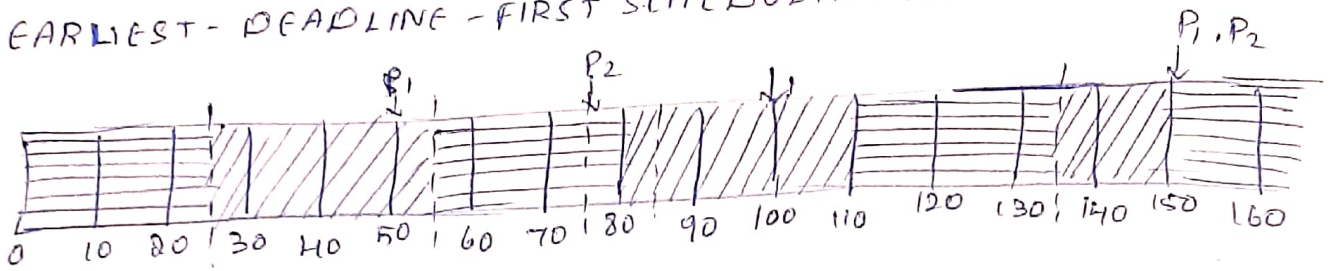
Initially, P_1 runs until it completes its CPU burst time at 25 ms.

Process P_2 then begins running & runs until time runs, when it is preempted by P_1 .

* At this time P_2 still has 10 ms remaining in its CPU burst time.

* Process P_1 runs until time 75 ms consequently P_2 misses the deadline for completion of its CPU burst at time 75. Hence, it results unsuccessfully

b) EARLIEST-DEADLINE-FIRST SCHEDULING (EDF)



Given P_1, P_2 $p_1=50, t_1=25$ $P_2=75, t_2=35$

Here, the priority is dynamic. Priorities are assigned according to deadlines.

1) earlier the deadline \Rightarrow higher priority

2) later the deadline \Rightarrow lower priority.

\therefore These two processes run successfully

$$\text{CPU utilization} = \sum \frac{t_i}{p_i}$$

$$= \frac{25}{50} + \frac{35}{75}$$

$$= \frac{1}{2} + \frac{7}{15}$$

$$= \frac{15+14}{30} = \frac{29}{30}$$

$$= 0.966 \times 100$$

$$\text{CPU utilization} = 96.6\%$$