CSE 4501 : Operating Systems **Quiz**
Islamic University of Technology (IUT)
Department of CSE **:3**
Time : 1 Hour
Date: Tuesday, 24 August 2021
Total Marks: 30

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With short term scheduling, there is no way to know the length of the next CPU burst. One way to solve this problem is to predict its value. We might expect that the next CPU burst will be similar in length to the previous ones. Generally, CPU bursts are predicted using the following formula,

$$\tau_n = \alpha \times t_n + (1 - \alpha) \times \tau_{n-1}$$

Where,

τ_n = Predicted value for the n^{th} CPU burst.
t_n = Length of the n^{th} CPU burst.
τ_{n-1} = The value of $(n-1)^{th}$ predicted CPU burst.
α = Controls the relative weight of the recent and past history. Consider $\alpha = 0.5$.

Now, consider 5 processes P_1, P_2, P_3, P_4, P_5 with the following CPU bursts

Table 1

Process	P_1	P_2	P_3	P_4	P_5
CPU burst (t_n)	6	4	5	3	3

Based on the above information answer the following questions.

1. Generate the list of predicted CPU bursts for the 5 processes using the formula mentioned above. For the first process, P_1, consider the value of τ_0 as the last 3 digits of your ID. For example, if the last 3 digits of your ID is 192, then, $\tau_0 = 192\ msec.$ (5)

   For floating point values, take their ceiling.

2. Based on the CPU bursts predictions obtained in **`Question 1`**, run the following scheduling algorithms and calculate their average waiting times.

   a. **Shortest Job First (SJF)** [Assume all processes arrive at time 0]. (5)
   b. **Shortest Remaining Time First (SRTF)** with the following arrival times, (5)

Table 2

Process	P_1	P_2	P_3	P_4	P_5
Arrival Time	0	1	4	6	7

c. **Preemptive Priority Scheduling** with the following priorities [Assume all processes arrive as **Table 2**], (10)

Table 3

Process	P_1	P_2	P_3	P_4	P_5
Priority	3	1	4	5	2

d. **Round Robin (RR)** with time quantum derived from the following formula, (5)

$$Q = .5 \times \tau_1 + .5 \times t_1$$