

Homework – Chapter 5

Name: _____

1. Multiprogrammed computers depend on the cpu burst – io burst cycle. Explain why. Write a C function, no matter how trivial, that does not behave this way:
2. The job of the CPU scheduler is to pick the next process to run. Truly, it is not possible to make a perfect scheduler. Explain why.
3. Preemptive scheduler depend on _____ to get control back from the currently running user program. Why can't the OS just take control back on its own?

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4. The text described two types of context switches – voluntary and involuntary. What triggers these different types?

5. Consider the following processes and then answer the following questions using *First-Come, First Served* scheduling:

<i>Process</i>	<i>Arrival Time</i>	<i>Burst Time</i>
<i>P1</i>	<i>0</i>	<i>1.5</i>
<i>P2</i>	<i>1</i>	<i>0.5</i>
<i>P3</i>	<i>3</i>	<i>2.5</i>
<i>P4</i>	<i>4</i>	<i>1.5</i>

- a. Show the Gantt chart for these four processes (see text for example):

- b. Compute the average *CPU utilization*:

- c. Compute the average *turn-around time*:

- d. Compute the average *wait-time*:

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6. Consider the following processes and then answer the following questions using *Shortest-Job First* scheduling:

<i>Process</i>	<i>Burst Time</i>
<i>P1</i>	<i>1.5</i>
<i>P2</i>	<i>0.5</i>
<i>P3</i>	<i>3.5</i>
<i>P4</i>	<i>4.5</i>

- a. Show the Gantt chart for these four processes (see text for example):

- b. Compute the average *CPU utilization*:

- c. Compute the average *turn-around time*:

- d. Compute the average *wait-time*:

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7. Considering your answer in question 2, suppose we have a job that has the following *actual* bursts. Using the *exponential average*, find an *alpha* value that minimizes the RMSQE between *predicted* and the *actual* burst:

$T_1 = 0.5, 1.5, 2.0, 1.5, 4, 2.5, 4, 2.5, 3.5$

- a. Show your results for computing alpha:

- b. Next, using your alpha value from part a, make predictions and compute the RMSQE for a job with following burst-times. Clearly state whether your accuracy was better or worse.

$T_2 = 1.5, 2.5, 3.5, 4.5, 5.5, 3.5, 1.5, 2.5, 3.5$

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8. Why do most OSes today use multi-level scheduling?