

COMP3520 Operating Systems Internals

Assignment 2 – Discussion Document

General Instructions

For the discussion document, all questions are compulsory. You **must** make a genuine attempt at questions. An attempt at a question is considered genuine **if and only if** it is honest **and** serious.

You must attempt this part of the assignment individually. You will be required to submit your work to *Turnitin* for similarity checking as part of assignment submission.

You must cite and reference all copied or paraphrased material that are not your own. Any suitable referencing scheme may be used. Where practical, you should use your own words.

You may use diagrams to support your written answers.

Please label your answers with the correct question numbers. Please include your University student identification number (but **not** your name) in your discussion document.

Submit your discussion document to the appropriate submission inbox in the COMP3520 Canvas website.

The discussion document is worth **40 %** of full marks for Assignment 2. Marking criteria are included in a separate document.

You may use a total number of 2-3 pages, but no more than 5 pages for all your answers to these questions.

Questions

In your answers, you will be assessed on how well you:

- Demonstrate understanding of relevant operating systems concepts;
 - Apply critical thinking and analytical skills; and
 - Present logical responses using appropriate information and ideas;
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Question 1 (3 points)

In the Stallings textbook, a “Fair-Share Scheduling” scheme is discussed (on pages 450 – 452). Carefully read this section and then:

- a. Explain how it works; and
- b. Discuss its potential advantages and disadvantages.

Question 2 (2 points)

In pseudo code for Round Robin dispatcher, the value of **quantum** may, or may not be equal to **time_quantum**. Discuss how do you calculate the value of **quantum** under different situations.

Question 3 (5 points)

You have a dispatcher list of 10 jobs as follows:

0, 1
0, 2
0, 3
0, 4
0, 5
0, 6
0, 7
0, 8
0, 9
0, 10

- a. Run your Round Robin dispatcher program under the following time quanta:
 - i. `time_quantum = 1;`
 - ii. `time_quantum = 5;`
 - iii. `time_quantum = 10.`

Give the average turnaround time and average waiting time for different time quanta.

- b. What are the implications by comparing these performance results? (You need to justify your answers.)

Question 4 (5 points)

You have a dispatcher list of 10 jobs as follows:

2, 19
7, 5
10, 3
22, 7
28, 3
51, 4
52, 24
67, 5
70, 2
75, 3

- a. your Round Robin dispatcher program under the following time quanta:
- time_quantum = 1;
 - time_quantum = 5;
 - time_quantum = 25.

Give the average turnaround time and average waiting time for different time quanta.

- c. What are the implications by comparing these performance results? (You need to justify your answers.)

Question 5 (5 points)

You have a dispatcher list of 10 jobs as follows:

0, 10
0, 10
0, 10
0, 10
0, 10
0, 10
0, 10
0, 10
0, 10
0, 10
0, 10

- a. Run your Round Robin dispatcher program under the following time quanta:
- time_quantum = 1;
 - time_quantum = 5;
 - time_quantum = 10.

Give the average turnaround time and average waiting time for different time quanta.

- d. What are the implications by comparing these performance results? (You need to justify your answers.)

Question 6 (5 points)

Compare First Come First Served Scheduling, and Round Robin Scheduling. In your comparison, include discussions of their potential advantages and disadvantages, and

which scheduling scheme performs better under what job load conditions. (You need to justify your answers.)