

CSC633 OPERATING SYSTEMS

Semester 1, 2020

ASSIGNMENT 1 (10%)

DUE DATE: 23rd March.2020 before 6 pm

Total: 40 marks

1. Discuss all the main purposes of an operating system? (3 marks)
2. Describe what are interrupts? How does an interrupt differ from a trap? Can traps be generated intentionally by a user program? If so, for what purpose? (3 mark)
3. Describe some of the challenges of designing operating systems for mobile devices compared with designing operating systems for traditional PCs. (3 marks)
4. Discuss how system calls function ? (3 marks)
5. Discuss three common ways of establishing relationship between the user and kernel thread? (3 marks)
6. Consider the FCFS, SJF, and RR (quantum = 10 milliseconds) scheduling algorithms for this set of processes. Which algorithm would give the minimum average waiting time? (6 marks)

Process	Burst Time
P1	10
P2	29
P3	3
P4	7
P5	12

- The processes are assumed to have arrived in the order *P1, P2, P3, P4, P5*, all at time 0.
- Draw Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, and RR

- What is the waiting time of each process for each of these scheduling algorithms?
- Which of the algorithms results in the minimum average waiting time (over all processes)?

For the following questions use Text book as well as you can browse Internet

7. What are the possible states that a thread can be in? (2 marks)
8. What are “zombie” threads? When does it finally get cleaned up? (3 marks)
9. Which function is used to put a thread to sleep? (2 mark)
10. As described in Section 4.7.2, Linux does not distinguish between processes and threads. Instead, Linux treats both in the same way, allowing a task to be more akin to a process or a thread depending on the set of flags passed to the `clone()` system call. However, other operating systems, such as Windows, treat processes and threads differently. Typically, such systems use a notation in which the data structure for a process contains pointers to the separate threads belonging to the process. Contrast these two approaches for modeling processes and threads within the kernel. (5 marks)
11. How does multiprogramming increase the utilization of resources? (3 mark)
12. Discuss the disadvantages of Linux systems (4 marks)

Submitting Instructions

Using **own words**, answer the above questions in detail. Well written text with proper referencing need to be submitted by the due date. Unreferenced material will receive low marks. This is individual work and students having identical submissions will have their marks equally divided among them. Take note of the University Plagiarism policy and all provisions of it apply.

This assignment will be received via moodle dropbox. Students are to upload their assignments before the due time. The normal similarity checks will take place and to be on the safe side students must ensure the similarity index is less than 20%.

Late Submission: The cutoff date and time specified will not allow for late moodle submissions. If for any assessed reason late submission is allowed, a penalty of 2 marks per day applies.