Name: Solutions Quiz 2 Email:

Operating Systems CS 1217 Spring 2023

Quiz 2 - March 14th 2023

Instructions

1. Total time allocated for this quiz is **15 minutes.** Quiz is worth **25** points
2. This quiz accounts for **3%** of your final grade.
3. Be precise in your answers; unnecessarily verbose answers will fetch negative marks

Q1 Answer yes/no, and provide a brief explanation.
(a) Is it necessary for threads in a process to have separate stacks? (**2.5 points**)
Yes. So that they can maintain their own state, and run independently.

(b) Is it necessary for threads in a process to have separate copies of the program executable? (**2.5 points**)
No. They share the same executable. More precisely, different threads share the regions in the processes' address space that contains code.

Q2. We have talked about oracular schedulers in class. Why can't oracular schedulers be implemented in real systems? Also, if these schedulers cannot actually be implemented, what is the purpose of studying them in the first place? (**5 points**)

They need the knowledge of the future to make decisions, not possible. Purpose : they provide a good upper limit on performance of any real world scheduler

Q3 What is the purpose of the timer interrupt on modern computer systems? Assume that I have a computer system, which on getting a hardware interrupt takes 2 μs to save the state of the currently running process. Also assume that the kernel runs the scheduler code every time the timer interrupt happens, which takes another 3 μs. Finally, context switching another process takes another 2 μs. If the kernel provides a scheduling quantum of 6 μs for any process to run, is this a sound design choice? Why or why not? (**10 points**)

Bad choice, overheads are too high. You are taking more time to make an overall scheduling decision (3+2+2=7μs), and the time quantum that a process gets to run on the CPU is smaller (6μs). This is more than 100% overhead. Ideally, you'd want the overhead of making a scheduling decision to be as low as possible, as compared to the scheduling quantum.

Q4: Which of the following three schedulers take into account the characteristics of every process while making a scheduling decision? Briefly explain: Round Robin, First Come First Serve, First in First Out. (**5 points**)
Ans: None