CS 2200 Homework 7

Spring 2019

Instructions:

- Please print a copy of the assignment and hand write your answers. No electronic submissions are allowed. **Please print as one double-sided page. Do NOT staple multiple sheets together. There will be a 50 point penalty if you do not.**
- This is an individual assignment. You may discuss concepts but not the answers.
- Due Date: **3/13/19 – 6:00 PM** in recitation. Bring your BuzzCard. Show up on time.

Name:_____ **GT Username:**_____ **Section:**_____

1. Assume the scheduler uses the *Shortest Remaining Time First (SRTF)* algorithm. Consider the following three processes vying for the CPU. The scheduler evaluates which process to run at the end of every time slot. The scheduling starts at time T_0.

Process	**Arrival Time**	**Execution Time**
P1	T_0	6 ms
P2	T_0 + 2 ms	3 ms
P3	T_0 + 4 ms	3 ms

a. Fill in the table below with the process that is executing on the processor during each time slot.

Interval T_0+	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Running													

b. Calculate the average wait time for this particular set of processes on this scheduler.

c. Calculate the throughput.

2. Briefly describe the role of the short term scheduler and the dispatcher.

3. Assume the scheduler uses the *Shortest Job First (SJF)* algorithm. Consider the following three processes vying for the CPU. Each process must complete 1 CPU burst, 1 I/O burst and then another 1 CPU burst. The scheduling starts at time T_0. Fill in the table below with which processes are executing a CPU or I/O burst during each time slot.

Process	**CPU**	**I/O**
P1	2	3
P2	3	2
P3	1	1

Interval T_0+	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CPU													
I/O													

4. True or False:

Claim	**T/F**
Processes and Jobs are synonymous.	
An intrinsic property that the scheduler uses is priority value.	
FCFS uses the intrinsic property of arrival time and doesn't starve any other processes.	
Quantitative measures of algorithm effectiveness include starvation and convoy effect.	
SRTF is the preemptive version of SJF.	
FCFS is fair because it stops respecting original arrival time of the processes after the first time it picks a process to run.	
The priority algorithm can be preemptive or non-preemptive.	

5. Which of the following values may be saved to a process control block (PCB)? Fill in the bubbles for all that apply.

◯ Program Counter (PC)
◯ Instruction Register (IR)
◯ General Purpose Registers ($t0, $s0, etc)
◯ Exception/Trap Register (ETR)
◯ Page Table Base Register (PTBR)