Stamatios Morellas
COM S 352 - Homework 4
Due 2/24/20 @ 11:59pm

5.11

I/O-bound programs are more likely to have **voluntary** context switches, while ***CPU-bound*** programs are more likely to have ***non-voluntary*** context switches. This is because voluntary context switches occur when processes require resources that are unavailable, so it gives up control of the CPU. A non-voluntary context switch happens when a process gets stripped of its control of the CPU because of an expired time slice or because it has been preempted by a higher-priority process.

5.15

$$Equation:\ \tau_{n+1} = \alpha t_n + (1-\alpha)\tau_n$$

a. $\tau_1 = 0 + (1 * 100) = \mathbf{100}$
b. $\tau_1 = (1 * t_0) + (1-1) * 10 = \mathbf{t_0}$

5.16

The regressive round-robin scheduler favors **CPU-bound** processes because if they can consume an entire time quantum, they get rewarded with higher priority and/or longer time quantum. I/O-bound processes will not change their priority and they will block before using their entire time quantum.

5.17

Part a:

FCFS:

P1	P2	P3	P4	P5

SJF:

P3	P2	P5	P1	P4

Non-preemptive priority:

P1	P5	P3	P4	P2

RR:

P1	P2	P3	P4	P5	P1	P2	P4	P5	P1	P4	P4

Part b:

FCFS:
P1 = 5, P2 = 8, P3 = 9, P4 = 16, P5 = 20

SJF:
P1 = 13, P2 = 4, P3 = 1, P4 = 20, P5 = 8

Non-preemptive priority:
P1 = 5, P2 = 20, P3 = 10, P4 = 17, P5 = 9

RR:
P1 = 16, P2 = 12, P3 = 5, P4 = 20, P5 = 16

Part c:

FCFS:
P1 = 0, P2 = 5, P3 = 9, P4 = 13, P5 = 12

SJF:
P1 = 8, P2 = 1, P3 = 0, P4 = 13, P5 = 4

Non-preemptive priority:
P1 = 0, P2 = 17, P3 = 9, P4 = 10, P5 = 5

RR:
P1 = 11, P2 = 9, P3 = 4, P4 = 13, P5 = 12

5.20

The correct answer is that **priority scheduling** can result in starvation.