Fall 2021 CSC 332 HW3 (ch4- Process Management)

**Due Nov 9, 11 PM.**

**Q1 to be done by people in Section K.**

**Q2 to be done by those in section M.**

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Consider process management with RR as discussed in ch 4.

Suppose we did the same shell command that created the 4 processes for ./cpu

Make these assumptions:

1. There is only one cpu.
2. There are only 5 processes in the system—A, B, C, D, and the shell.
3. Initially all the 4 user processes and the shell are in ready list in the order A, B, C,D, shell.
4. Some parts of a process may be on disk.
5. The only interrupts in the system are the Hardware Timer and interrupts caused by execution of these processes.
6. **The cpu scheduler:**

The cpu scheduler strictly follows the RR algorithm, with time slice = 5 seconds.

When a ready proc gets cpu, it gets a fresh time slice of 5 seconds. This slice has nothing to do with how much time it has already executed before becoming ready.

1. When a proc terminates (normal termination or runtime abortion), an interrupt is generated and a service routine is called. The service routine will do some work such as updating state of the process etc. and the cpu scheduler gives cpu to another process. Any unused time of the process that just terminated, is gone and is irrelevant.
2. The spin(1) in the code will take roughly 1 second of computation time. Any other computation will take nearly zero time, ex. the initial if statement, checking the loop condition, executing a service routine, etc.
3. Once a process executes the printf statement in cpu.c, it gets blocked until that output text line has been printed. One print operation of a text line takes 1 second. The output device prints things in strictly First-come-first-served order.
4. When an i/o is finished, the corresponding process gets to ready state.

Q1. Is it possible to get a printout like:

A

C

….(some unknown stuff)

Give a detailed scenario to explain this, i.e., sequence of events like which process started executing, what did it do, how did its state change, an interrupt generated, etc.

Explain why in this scenario we are not getting the output A,B,… In other words, we would normally expect a ‘B’ after the ‘A’. What might have happened?

**Q2**. Is it possible to get a printout like:

A

A

….(some unknown stuff)

Give a detailed scenario to explain this, i.e., sequence of events like which process started executing, what did it do, how did its state change, an interrupt generated, etc.