COMP SCI 3004/7064 Operating Systems

Tutorial II-b

1. Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use nonpreemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P_1	0.0	8
P_2	0.4	4
P_3	1.0	1

(1) What is the average turnaround time for these processes with the FCFS scheduling algorithm?

(2) What is the average turnaround time for these processes with the SJF scheduling algorithm?

(3) The SJF algorithm is supposed to improve performance, but notice that we chose to run process P_1 at time 0 because we did not know that two shorter processes would arrive soon. Computer what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used. Remember that processes P_1 and P_2 are waiting during this idle time, so their waiting time may increase. This algorithm could be known as future-knowledge scheduling.

2. Consider a variant of the RR scheduling algorithm where the entries in the ready queue are pointers to the PCBs.

(1) What would be the effect of putting two pointers to the same process in the ready queue?

(2) What would be the major advantages and disadvantages of this scheme?

(1) What would you modify the basic RR algorithm to achieve the same effect without the duplicate pointers?

3. What advantage is there in having different time-quantum sizes on different levels of a multilevel queuing system?

4. Many CPU scheduling algorithms are parameterized. For example, the RR requires a parameter to indicate the time slice. Multilevel feedback queues require parameters to define the number of queues, the scheduling algorithms for each queue, the criteria used to move processes between queues, and so on.

These algorithms are thus really sets of algorithms (for example, the FCFS algorithm is the RR algorithm with an infinite time quantum). What (if any) relation holds between the following pairs of sets of algorithms?

(1) Priority and SJF

(2) Multilevel feedback queues and FCFS

(3) Priority and FCFS

(4) RR and SJF