**Exercises on Scheduling**

**Exercise 1**

Consider the following set of processes, with the length of the CPU-burst

time given in milliseconds:

Process Arrival Time Burst Time

P1 0 3

P2 1 6

P3 4 4

P4 5 2

(a) Draw three Gantt charts illustrating the execution of these processes using the following scheduling algorithms:

* FCFS
* Nonpreemptive SJF
* RR (quantum = 3)

(b) What is the waiting time of each process for each of the scheduling

algorithms in (a)? What is the average waiting time?

(c) What is the turnaround time of each process for each of the scheduling

algorithms in (a)? What is the average turnaround time?

(d) Which of the scheduling algorithms in (a) results in the minimal average

waiting time ? Explain why.

(e) For the RR scheduling, how many context switches occurred? If the quantum were increased to 4, how many context switches would occur?

**Exercise 2**

Same as above but use the different tables with Arrival Time/Burst Time given in your notes.

**Exercise 3**

CPU efficiency = [time spent on processes/(time spent on processes + context switch time)] \* 100

i.e. the percentage of the overall time the processor is doing something useful i.e. not performing context switches

Consider a system running ten I/O-bound tasks and one CPU-bound

task. Assume that the I/O-bound tasks issue an I/O operation once for

every millisecond of CPU computing and that each I/O operation takes

10 milliseconds to complete. Also assume that the context switching

overhead is 0.1millisecond and that all processes are long-running tasks.

What is the CPU efficiency for a round-robin scheduler when the time

quantum is 10 milliseconds?