Operating Systems Laboratory
Spring Semester 2017-18

Assignment 3a

Simulation of CPU Scheduling Algorithms

Assignment given on: January 29, 2018
Assignment deadline: February 05, 2018

The objective of this assignment is to generate random arrival times and CPU bursts for a set of processes following some probability distribution, and study the performances of various CPU scheduling algorithms through simulation. The specifications for the problem are as follows.

a) Read the number of processes N, and generate the arrival times and CPU bursts of the processes using some probability distribution. The first process is assumed to arrive at time 0; for all subsequent processes the *inter-arrival time* is generated as a random variable (between 0 and 10) following exponential distribution with some given mean. Also the CPU bursts of the processes are generated as uniform random variables (between 1 and 20). Save the generated table in a file.

Hint*: If R is a uniform random number in the range (0, 1), a random variable from an exponential distribution with mean λ can be generated as:*

$(-1.0 / \lambda) * \log_e R$.

b) Simulate the following CPU scheduling algorithms on the process arrival trace as generated in (a) above, and compute the average turnaround times (ATN) for the processes:

(i) First Come First Serve (FCFS)

(ii) Pre-emptive Shortest Job First

(iii) Round Robin with time quantum δ = 1, 2 and 5 time units.

c) Run the simulation for N = 10, 50 and 100, ten times for each value of N, and generate the plot comparing the average values of ATN obtained for various scheduling techniques for different values of N.

Submission Guideline:

- Create the program as a single file as **`Ass3a_<groupno>.c`** or **`.cpp`**. Create the plot file as **`Ass3a_plot_<groupno>.pdf`** . Upload the two files.
- You must show the running version of the program to your assigned TA during lab hours.