

PROJECT

Process Scheduling Algorithms

PROJECT DESCRIPTION

The purpose of this project is to compare the performance of several process scheduling algorithms.

A scheduling algorithm determines, for each time step, which process should be running. We will assume that there is only a single processor shared by all processes. The main objective of each algorithm is to minimize the average time a process spends in the system. This is referred to as the average turnaround time, and is computed as the average of all real times, r_i , each process (i) spends in the system. Each r_i is the sum of the total service time, t_i , plus the time the process i spent in the system waiting (no executing) since its arrival. (Refer to Section 5.2.3.)

Your assignment is to implement the following scheduling algorithms: FIFO, SJF, SRT, and MLF. (Refer to Section 5.2.2.)

Make the following assumptions:

- The smallest unit of time is 1
- All times (i.e., process arrivals, total service times, and waiting times) are given as integers (i.e., multiples of the basic time unit)
- A context switch between any two processes requires 0 time.
- For MLF, assume $n = 5$ and $T = 1$; at each priority level, the decision made is nonpreemptive, i.e., each process is allowed to complete its allocated time unless preempted by a higher-priority process
- In case of a priority tie between multiple processes, the arbitration rule picks the processes with the smallest process number i

You will be given a series of arrival times (ar_i) and total service times (t_i) for n processes in the form of a text file. Your program is to read this file and, for each of the above scheduling algorithm, determine the individual service times r_i of all n processes and the average turnaround time.