

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 $T = 1$. Any new process enters at the top priority level and moves down to the next lower level whenever it exhausts the maximum time allowed at that level. Within each priority level, processes are handled in FIFO order, i.e., each process stays at the head of the current queue and is allowed to complete its allocated time before all other processes at the same level.
- 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.