William Bermel 4/29/2023

Professor Gass CSCI 330 M01

Operating Systems CPU Scheduling Simulator

Data:

Time Quantum (s)	CPU Running Time (s)	CPU Idle Time (s)	CPU Utilization (%)	Throughput (# of processes)	Average Turnaround Time (s)
2	27	85	25.43	6	19
3	27	61	32.22	6	14
4	27	50	36.70	6	12
5	27	41	41.42	6	10
6	27	38	43.28	6	8

Analysis:

Over the five different time quantums, the results varied but overall followed a specific pattern. As the time quantums increased, so did the CPU utilization, and this is due to the CPU being idle for a shorter total period of time. The average CPU running time was 27s, while the average CPU idle time was 55s to complete all of the processes. The average CPU utilization was 35.81%, while the average process turnaround time was 12.6s and the average throughput was 6 processes. Now, the CPU utilization definitely seems low for only 6 processes, but this is mainly caused by the long arrival times for each process. It is also worth noting that the CPU running time never changes, because the processes all have set times to completion. Similarly,

the throughput remains constant because for this trial, the same list of processes was used for the five different time quantums.

Conclusion:

Overall, this program functions as directed, and although some bugs were encountered along the way, the program runs properly and easily calculates the CPU utilization for a list of given processes. Although it may not be the most efficient algorithm, it definitely works as intended. One way to increase the CPU utilization, other than altering the algorithm, would be to insert processes with smaller arrival times. This would ensure that the CPU can focus on executing the processes instead of bringing them into the correct queue. However, this is an unrealistic request for real CPUs. So, I welcome the user to test out different arrival and burst times, as well as different time quantums, so that they can see firsthand how a CPU scheduler is intended to run.