**Kennesaw State University**

**College of Computing and Software Engineering**

**DEPARTMENT OF COMPUTER SCIENCE**

**CS 3502 / Operating Systems / Section 01**

**Assignment 6**

**Alex Kimbell /** [**jkimbel2@students.kennesaw.edu**](mailto:jkimbel2@students.kennesaw.edu)

**November 9th, 2017**

**Summary and Purpose of the Assignment**

The purpose of this assignment is to implement three simulation models that apply the disk scheduling algorithms of FCFS, SSTF, and SCAN. These models use the normal distribution for generating a queue of I/O requests.

**Results**

Dsfcfsn

Psim3 project: Disk FCFS Sched (Normal)

Simulation date: Thu Nov 9 12:21:05 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1376

Average waiting time: 2245.92

Disk utilization: 0.78564

-------------------------------------------------------------

End of simulation Disk FCFS Sched (Normal) Thu Nov 9 12:21:05 2017

Dsfcfsn double transfer rate

Psim3 project: Disk FCFS Sched (Normal)

Simulation date: Thu Nov 9 14:02:27 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1376

Average waiting time: 2240.86

Disk utilization: 0.784621

-------------------------------------------------------------

End of simulation Disk FCFS Sched (Normal) Thu Nov 9 14:02:27 2017

Dsfcfsn double seek time

Psim3 project: Disk FCFS Sched (Normal)

Simulation date: Thu Nov 9 14:04:45 2017

Total number of requests that arrived: 42

Total number of serviced requests: 26

Total head movement in cylinders: 921

Average waiting time: 3024.77

Disk utilization: 0.900948

-------------------------------------------------------------

End of simulation Disk FCFS Sched (Normal) Thu Nov 9 14:04:45 2017

Dssstfn

Psim3 project: Disk SSTF Sched (Normal)

Simulation date: Thu Nov 9 12:21:23 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1208

Average waiting time: 773.987

Disk utilization: 0.69034

-------------------------------------------------------------

End of simulation Disk SSTF Sched (Normal) Thu Nov 9 12:21:23 2017

Dssstfn half transfer

Psim3 project: Disk SSTF Sched (Normal)

Simulation date: Thu Nov 9 14:08:02 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1412

Average waiting time: 240.21

Disk utilization: 0.3645

-------------------------------------------------------------

End of simulation Disk SSTF Sched (Normal) Thu Nov 9 14:08:02 2017

Dscann

Psim3 project: Disk SCAN Sched with Normal Dist.

Simulation date: Thu Nov 9 12:20:49 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1126

Average waiting time: 949.301

Disk utilization: 0.643825

-------------------------------------------------------------

End of simulation Disk SCAN Sched with Normal Dist. Thu Nov 9 12:20:49 2017

Dscann half transfer

Psim3 project: Disk SCAN Sched with Normal Dist.

Simulation date: Thu Nov 9 14:36:24 2017

Total number of requests that arrived: 42

Total number of serviced requests: 42

Total head movement in cylinders: 1376

Average waiting time: 252.21

Disk utilization: 0.355337

-------------------------------------------------------------

End of simulation Disk SCAN Sched with Normal Dist. Thu Nov 9 14:36:24 2017

**Conclusion**

In conclusion, I have gained a better understanding on different I/O policies and the benefits and determents of them compared to each other. I was able to learn as to why requests are slower and how to increase speeds.

**Assignment Questions**

1. How would you modify the programs that implement the disk scheduling policies to reflect a disk with 30\% faster seek time, and 40\% faster transfer time. How does this affect the performance of the disk management?
   * To decrease seek time and gain a faster transfer time simulation you would change the seek time parameters, decreasing this parameter results in a different seek time per request. As well changing the transfer time rate results in a decrease in average waiting time.
2. Compare the FCFS disk scheduling policy with the other three. Use several values for the workload parameters. Can you reach any conclusion that would generalize why FCFS is the least favorable policy to use, and which of the other three should be used? Give your arguments.
   * By comparing FCFS to the other policies you can see that overall FCFS is slower. The reason for this is because it takes it completes requests as it receives them, if two requests are maximum distance from each other the travel time is very long. There is nothing sorting these requests to make an efficient route of completion.
3. Why are the techniques used in the models called disk scheduling techniques?
   * They are policies that organize requests to best serve those requests. It’s not a scheduling policy but a policy to efficiently execute the requests.
4. What is the main problem that this model is helping you to understand?
   * How the different scheduling algorithms of FCFS,SSTF, and SCAN function and the befits and determents of each compared to the others.
5. What can you observe by analyzing the trace from the simulation runs?
   * You can see the seek time for each request as well as the cylinder movement for each.
6. What are the results for this type of model?
   * Average wait time, head movement, CPU utilization, number of request, and number of served request
7. What are the main differences with previous models of OS (in this course)?
   * This model simulates data storage while the previous models have simulated memory.
8. How can you compute the waiting time (average) for these disk requests?
   * You can calculate the waiting time by adding the seek time and transfer time.