CSE 306 – Operating Systems
Project 3: Devices
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I pledge my honor that all parts of this project were done by me individually and without collaboration with anybody else.

Statistics for Demo.jar

Throughput = total number of tasks completed / simulation time = 45/4 = 11.25

Snapshot	Total no. of Tracks swept			Average no. of tracks swept per I/O request			Average turnaround time per I/O request		
	D0	D1	D2	D0	D1	D2	D0	D1	D2
1	866	6	5	4	1	1	202	452	576
2	2212	19	11	6	1	2	625	273	1307
3	3289	20	11	7	1	1	601	362	826
4	3512	29	14	6	1	1	516	319	811
5	4093	57	17	6	2	1	431	249	779
6	4536	71	20	5	2	1	426	222	749
7	4990	95	22	5	2	1	383	204	755
8	5766	113	25	5	2	1	367	212	755
9	7161	120	25	5	2	1	413	210	755
10	8582	133	25	6	2	1	427	233	755

Statistics for my OSP Program with CSCAN device scheduling scheme

Throughput = total number of tasks completed / time = 48/2 = 24

Snapshot	Total no. of Tracks swept			Average no. of tracks swept per I/O request			Average turnaround time per I/O request		
	D0	D1	D2	D0	D1	D2	D0	D1	D2
1	861	0	7	4	0	1	572	30	556
2	1953	6	9	5	1	1	691	171	550
3	2894	10	13	6	1	1	785	334	540
4	3350	26	13	5	1	1	821	253	540
5	3751	27	19	5	1	1	886	486	794
6	4258	27	25	5	1	1	807	486	770
7	4990	32	25	5	1	1	1133	452	676
8	5717	32	25	5	1	1	1203	424	676
9	6485	42	31	5	1	1	1151	633	681
10	7047	54	45	5	1	1	1163	585	686

Explanation of Results:

The First-In First-Out(FIFO) strategy just retrieves the oldest IORB in the head of queue and moves the disk head accordingly to that track to service that request

C-SCAN strategy scans the sorted queue in a certain direction and picks the IORB whose track is the next closest track to the current position of the disk head. If it reaches the last track on the other edge, the head returns to the beginning and starts scanning again
Total number of tracks swept is more or less the same for both FIFO and CSCAN strategy as the IO requests needed to be serviced according to their track numbers, so the tracks traversed should more or less be the same, just the order would be different.

The average number of tracks swept is lesser in case of CSCAN, with the number being 1 in case of Device 1 and 2 in most cases. This is because CSCAN orders the IO requests and picks the one with the next highest track number unlike FIFO which services requests on a first come first serve without any track order, hence the average number of tracks swept in FIFO is higher.

The average turnaround time is more or less the same in case of Swap device(Device 0) and Device 1 for both FIFO and CSCAN, but is lesser in case of Device 2 for the CSCAN scheduling strategy, indicating that the requests are serviced relatively quicker in this case.
CSCAN can cause starvation resulting in higher turnaround times as it only comes back to the previous tracks once it has traversed the entire diameter of the tracks. Hence the IORBs which arrive at earlier

tracks after the DiskHead has crossed that track will have to wait for the next pass of the head. This was the case being observed in the above devices.

The throughput for CSCAN strategy is higher than FIFO strategy of Demo.jar as the CSCAN strategy handles IO requests more efficiently with organized movement of disk head compared to the random movements in FIFO. As a result, higher number of tasks were completed in CSCAN with lower simulation time compared to FIFO resulting in higher throughput.