

**COMP 322/L—Introduction to Operating Systems and System Architecture**  
**Assignment #5—Disk Scheduling**

**Objective:**

- To compare the performance of disk scheduling algorithms: First-in-first-out (FIFO), Shortest-seek-time-first (SSTF), Scan, and C-Scan.

**Specification:**

- The program compares the disk scheduling algorithms: First-in-first-out (FIFO), Shortest-seek-time-first (STTF), Scan, and C-Scan in terms of traversing a set of tracks input by the user, and calculates the total distance of the tracks traversed.
- A menu controls the operations, and each choice calls the appropriate procedure, where the choices are:
  - 1) Enter parameters
  - 2) Calculate distance to traverse tracks using FIFO
  - 3) Calculate distance to traverse tracks using SSTF
  - 4) Calculate distance to traverse tracks using Scan
  - 5) Calculate distance to traverse tracks using C-Scan
  - 6) Quit program and free memory

**Assignment:**

- For a sequence of size  $m$ , a disk scheduling algorithm accepts a starting track followed by a sequence of  $m-1$  integers, where each index value  $t$  is a request to seek track  $t$ .
- Each scheduling algorithm generates an ordering according to which the  $m-1$  requests are serviced from the starting track, and calculates the distance of the tracks traversed.

**What NOT to do (any violation will result in an automatic score of 0 on the assignment):**

- Do NOT modify the choice values (1,2,3,4,5,6) or input characters and then try to convert them to integers--the test script used for grading your assignment will not work correctly.
- Do NOT turn in an alternate version of the assignment downloaded from the Internet (coursehero, chegg, reddit, github, etc.) or submitted from you or another student from a previous semester.
- Do NOT turn in your assignment coded in another programming language (C++, C#, Java).

**What to turn in:**

- The source code as a C file uploaded to Canvas by the deadline of 11:59pm PST (-20% per consecutive day for late submissions, up to the 4th day—note 1 minute late counts as a day late, 1 day and 1 minute late counts as 2 days late, etc.)
- Make sure your code compiles with the online C compiler before submitting:  
[https://www.onlinegdb.com/online\\_c\\_compiler](https://www.onlinegdb.com/online_c_compiler)

## Sample output

### Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan
- 6) Quit program and free memory

Enter selection: 1

Enter size of sequence: 5

Enter starting track: 5

Enter sequence of tracks to seek: 12 3 7 4

### Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan
- 6) Quit program and free memory

Enter selection: 2

Traversed sequence: 5 12 3 7 4

The distance of the traversed tracks is: 28

### Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan
- 6) Quit program and free memory

Enter selection: 3

Traversed sequence: 5 4 3 7 12

The distance of the traversed tracks is: 16

### Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan
- 6) Quit program and free memory

Enter selection: 4

Enter initial direction: (0=decreasing, 1=increasing): 1

Traversed sequence: 5 7 12 4 3

The distance of the traversed tracks is: 21

### Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan

6) Quit program and free memory

Enter selection: 5

Traversed sequence: 5 7 12 3 4

The distance of the traversed tracks is: 22

Disk scheduling

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- 1) Enter parameters
- 2) Calculate distance to traverse tracks using FIFO
- 3) Calculate distance to traverse tracks using SSTF
- 4) Calculate distance to traverse tracks using Scan
- 5) Calculate distance to traverse tracks using C-Scan
- 6) Quit program and free memory

Enter selection: 6

Quitting program...