**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 (SSTF), 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

**Sample output**

```
Disk scheduling
---------------
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
---------------
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: 23

Disk scheduling
---------------
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: 11

Disk scheduling
---------------
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: 16

Disk scheduling
---------------
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): 0
Traversed sequence: 5 4 3 7 12
The distance of the traversed tracks is: 11

Disk scheduling
---------------
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: 17

Disk scheduling
---------------
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...
```