CS 3413

Assignment 9

Due Date: November 30th, 2020 at 9:30 am

ASSIGNMENT IS TO BE COMPLETED INDIVIDUALLY BY ALL STUDENTS!

Your solution (containing all disk scheduling algorithms) should be submitted via D2L. All solutions are to be written in C.

Write a program that implements the following disk scheduling algorithms:

- FCFS (F)
- SSTF (T)
- C-SCAN (C)
- LOOK (L)

Your program will service a disk with 10,000 sectors numbered 0 to 9999. The program will read a series of sector requests from stdin (no maximum and in time sequence) and service them according to each of the algorithms listed above. Sector requests are in the following format:

```
123 15
```

The first number is the sector to read, the second number is the time that the request arrives. Both numbers are unsigned positive integers. The program will be passed three parameters on the command line: i) a letter indicating the algorithm to use; ii) the initial position of the disk head; and iii) the direction of initial movement (a - ascending or d - descending). For example: `./a.out T 53 a` will be used to run your program using the SSTF algorithm with the head starting at position 53 and spinning in the ascending direction.

To service requests, the OS can only serve requests **after** they arrive. Your program starts at time 0. The time (unsigned int) required to process a request is based on the following formula that considers the distance (unsigned int) that the head has to move divided by 10 plus an additional cost of 5 if the disk movement requires changing direction.

```
time = distance/10 + (reverse_direction) ? 5 : 0;
```

Note that you will decide which sector to read next only at the time you finish reading the previous sector you selected. This means that your solution does not change it's behavior based on new requests that come in after you make your decision. After execution the program will report the total amount of head movement required and the total time required to service all requests.
