LAB - 10

Write a C program to simulate disk scheduling algorithms
a) FCFS
b) SCAN
c) C-SCAN

Source Code:

```
#include <stdio.h>
#include <stdlib.h>

#define MAX_REQUESTS 100

void fcfs(int requests[], int n, int start) {
   int totalSeek = 0, current = start;

   printf("FCFS Disk Scheduling:\n");

   for (int i = 0; i < n; i++) {
      totalSeek += abs(current - requests[i]);
      printf("Move from %d to %d\n", current, requests[i]);
      current = requests[i];
   }

   printf("Total Seek Distance: %d\n", totalSeek);
}

void scan(int requests[], int n, int start, int maxCylinder) {
   int totalSeek = 0, current = start;

   printf("SCAN Disk Scheduling:\n");

   int direction = 1; // 1 for right, -1 for left
   int maxIndex = (direction == 1) ? maxCylinder : 0;
   for (int i = 0; i < n; i++) {
      totalSeek += abs(current - requests[i]);
      printf("Move from %d to %d\n", current, requests[i]);
      current = requests[i];
   }

   totalSeek += abs(current - maxIndex);
   printf("Move from %d to %d\n", current, maxIndex);
```

```
    for (int i = n - 1; i >= 0; i--) {
        totalSeek += abs(maxIndex - requests[i]);
        printf("Move from %d to %d\n", maxIndex, requests[i]);
        maxIndex = requests[i];
    }

    printf("Total Seek Distance: %d\n", totalSeek);
}

void cScan(int requests[], int n, int start, int maxCylinder) {
    int totalSeek = 0, current = start;

    printf("C-SCAN Disk Scheduling:\n");

    int maxIndex = maxCylinder;

    for (int i = 0; i < n; i++) {
        totalSeek += abs(current - requests[i]);
        printf("Move from %d to %d\n", current, requests[i]);
        current = requests[i];
    }

    totalSeek += abs(current - maxIndex);
    printf("Move from %d to %d\n", current, maxIndex);

    current = 0;
    for (int i = 0; i < n; i++) {
        totalSeek += abs(current - requests[i]);
        printf("Move from %d to %d\n", current, requests[i]);
        current = requests[i];
    }

    printf("Total Seek Distance: %d\n", totalSeek);
}

int main() {
    int requests[MAX_REQUESTS], n, start, maxCylinder;

    printf("Enter the number of requests: ");
    scanf("%d", &n);

    if (n > MAX_REQUESTS) {
        printf("Maximum number of requests exceeded.\n");
        return 1;
    }
```

```
    printf("Enter the requests: ");
    for (int i = 0; i < n; i++)
        scanf("%d", &requests[i]);

    printf("Enter the starting position: ");
    scanf("%d", &start);

    printf("Enter the maximum cylinder value: ");
    scanf("%d", &maxCylinder);

    fcfs(requests, n, start);
    scan(requests, n, start, maxCylinder);
    cScan(requests, n, start, maxCylinder);

    return 0;
}
```

Output

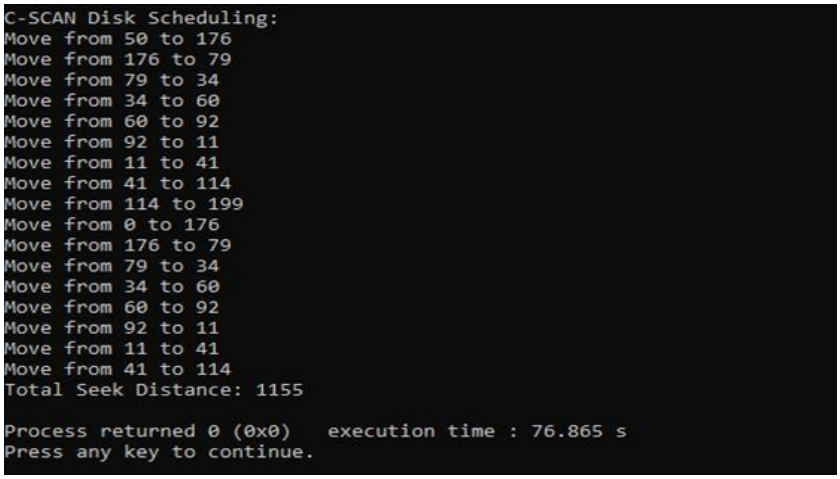
FCFS:

```
Enter the number of requests: 8
Enter the requests: 176 79 34 60 92 11 41 114
Enter the starting position: 50
Enter the maximum cylinder value: 199
FCFS Disk Scheduling:
Move from 50 to 176
Move from 176 to 79
Move from 79 to 34
Move from 34 to 60
Move from 60 to 92
Move from 92 to 11
Move from 11 to 41
Move from 41 to 114
Total Seek Distance: 510
```

SCAN:

```
SCAN Disk Scheduling:
Move from 50 to 176
Move from 176 to 79
Move from 79 to 34
Move from 34 to 60
Move from 60 to 92
Move from 92 to 11
Move from 11 to 41
Move from 41 to 114
Move from 114 to 199
Move from 199 to 114
Move from 114 to 41
Move from 41 to 11
Move from 11 to 92
Move from 92 to 60
Move from 60 to 34
Move from 34 to 79
Move from 79 to 176
Total Seek Distance: 1064
```

C-SCAN:


C-SCAN Disk Scheduling:
Move from 50 to 176
Move from 176 to 79
Move from 79 to 34
Move from 34 to 60
Move from 60 to 92
Move from 92 to 11
Move from 11 to 41
Move from 41 to 114
Move from 114 to 199
Move from 0 to 176
Move from 176 to 79
Move from 79 to 34
Move from 34 to 60
Move from 60 to 92
Move from 92 to 11
Move from 11 to 41
Move from 41 to 114
Total Seek Distance: 1155
Process returned 0 (0x0) execution time : 76.865 s
Press any key to continue.