Write a C program to simulate disk scheduling algorithms

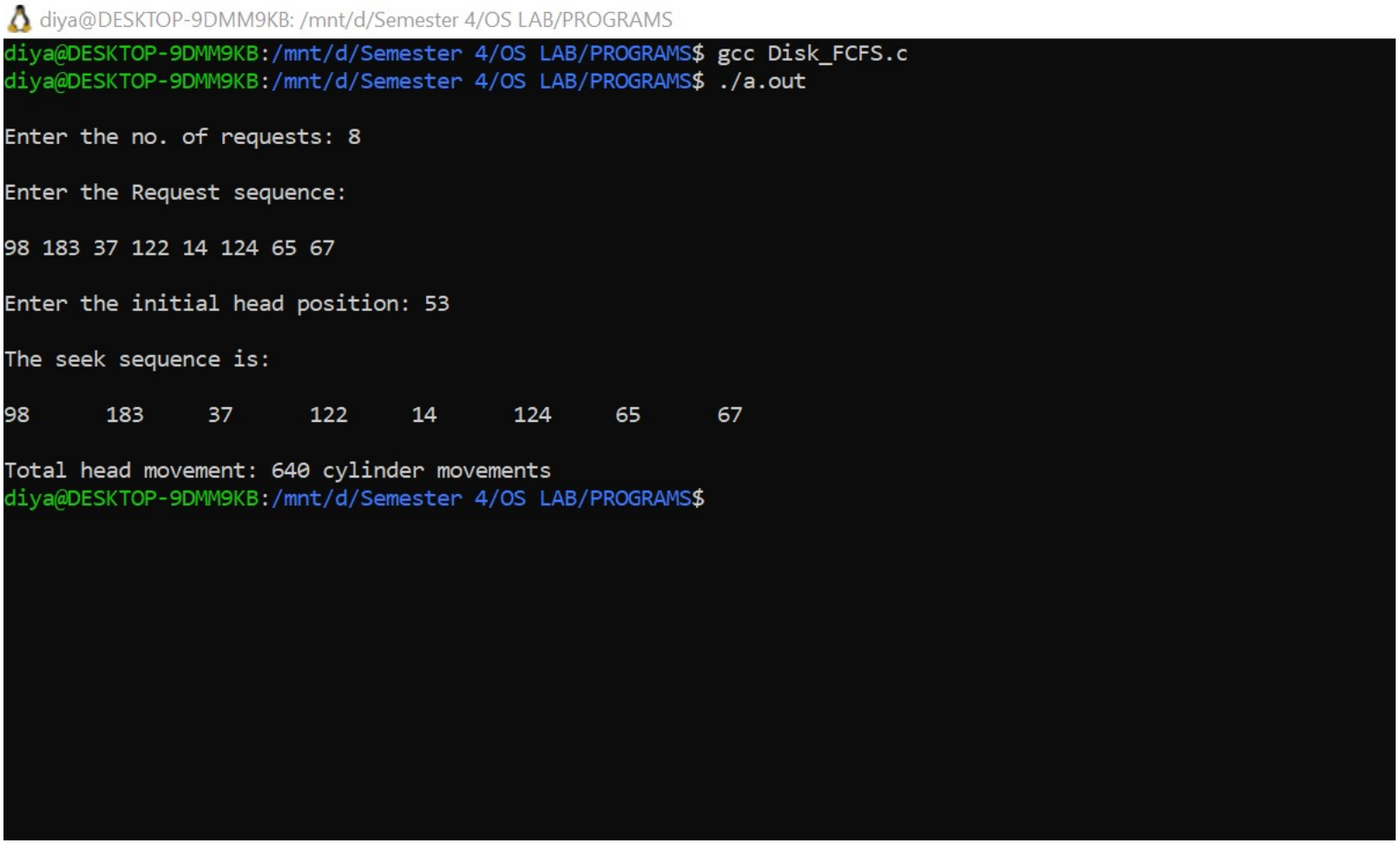
a) FCFS b) SCAN c) C-SCAN

a) FCFS

```c
//Write a C program to simulate FCFS disk scheduling algorithm

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

int seek = 0;      // To store the total head movement

void FCFS(int queue[],int n,int head)  //FCFS Scheduling
{
   int diff;      // To store the difference

   for(int i=0;i<n;i++)
    {
        diff = abs(head - queue[i]);
        seek += diff;
        head = queue[i];

        printf("%d\t",queue[i]);  //Printing the seek sequence
    }
}
```

```c
void main()
{
    int queue[10],n,head;

    printf("\nEnter the no. of requests: ");
    scanf("%d",&n);

    printf("\nEnter the Request sequence:\n\n");
    for(int i=0;i<n;i++)
        scanf("%d",&queue[i]);

    printf("\nEnter the initial head position: ");
    scanf("%d",&head);

    printf("\nThe seek sequence is:\n\n");
    FCFS(queue,n,head);
    printf("\n\nTotal head movement: %d cylinder movements\n",seek);   //Printing total head movement
}
```

Output:


diya@DESKTOP-9DMM9KB: /mnt/d/Semester 4/OS LAB/PROGRAMS
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ gcc Disk_FCFS.c
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ ./a.out
Enter the no. of requests: 8
Enter the Request sequence:
98 183 37 122 14 124 65 67
Enter the initial head position: 53
The seek sequence is:
98 183 37 122 14 124 65 67
Total head movement: 640 cylinder movements
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$

b) SCAN

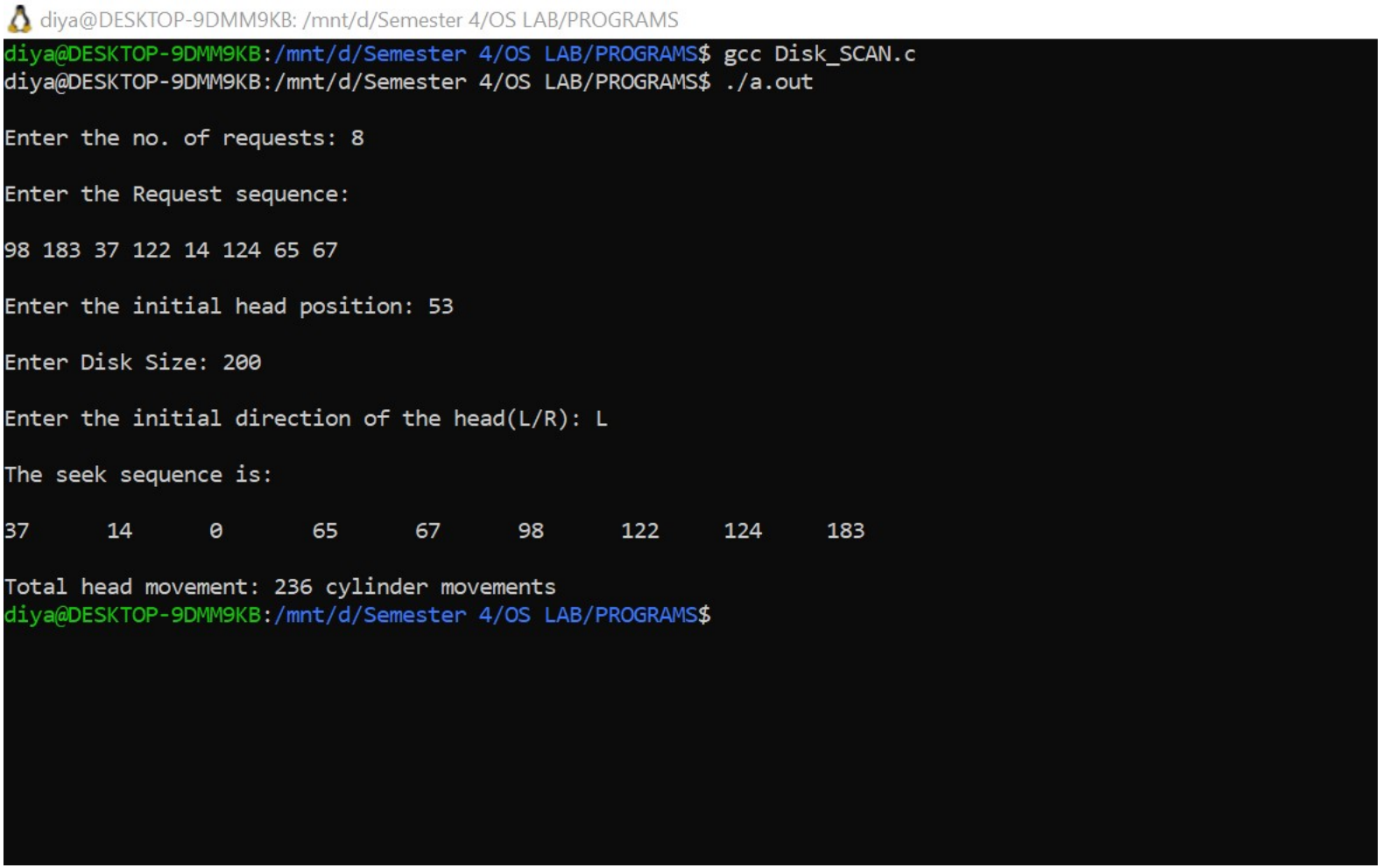
```c
//Write a C program to simulate SCAN disk scheduling algorithm

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

int seek_seq[10], size, seek = 0, count = 0;

void Sort(int a[], int n)   //Function for Sorting
{
    int temp;

    for(int i=0;i<n;i++)
    {
        for(int j=0;j<n-1;j++)
        {
            if(a[j] > a[j+1])
            {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}
```

```
void SCAN(int queue[], int n, int head, char dir)   //SCAN Scheduling
{
    int diff , left[10], right[10], l = 0, r = 0, run = 0;

    if(dir == 'L')
    {
        left[0] = 0;
        l++;
    }

    else if(dir == 'R')
    {
        right[0] = size - 1;
        r++;
    }

    for(int i=0;i<n;i++)     //Inserting elements into left[] and right[] according to head
    {
        if(queue[i] < head)
            left[l++] = queue[i];
        else
            right[r++] = queue[i];
    }

    Sort(left,l);     //Sorting  left[]
    Sort(right,r);    //Sorting right[]

    while(run < 2)
    {
        if(dir == 'L')
        {
            for(int i=l-1;i>=0;i--)
            {
                diff = abs(head - left[i]);
```

```
                seek += diff;
                seek_seq[count++] = left[i];
                head = left[i];
            }

            dir = 'R';
        }

        else
        {
            for(int i=0;i<r;i++)
            {
                diff = abs(head - right[i]);
                seek += diff;
                seek_seq[count++] = right[i];
                head = right[i];
            }

            dir = 'L';
        }

        run++;
    }

}

void main()
{
    int queue[10],n,head;
    char dir;

    printf("\nEnter the no. of requests: ");
    scanf("%d",&n);
```

```
    printf("\nEnter the Request sequence:\n\n");
    for(int i=0;i<n;i++)
        scanf("%d",&queue[i]);

    printf("\nEnter the initial head position: ");
    scanf("%d",&head);

    printf("\nEnter Disk Size: ");
    scanf("%d",&size);

    printf("\nEnter the initial direction of the head(L/R): ");
    scanf(" %c", &dir);
    dir = toupper(dir);

    SCAN(queue,n,head,dir);

    printf("\nThe seek sequence is:\n\n");
    for(int i=0;i<count;i++)
        printf("%d\t",seek_seq[i]);
    printf("\n\nTotal head movement: %d cylinder movements\n",seek);   //Printing total head movement
}
```

Output:


diya@DESKTOP-9DMM9KB: /mnt/d/Semester 4/OS LAB/PROGRAMS
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ gcc Disk_SCAN.c
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ ./a.out
Enter the no. of requests: 8
Enter the Request sequence:
98 183 37 122 14 124 65 67
Enter the initial head position: 53
Enter Disk Size: 200
Enter the initial direction of the head(L/R): L
The seek sequence is:
37 14 0 65 67 98 122 124 183
Total head movement: 236 cylinder movements
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$

c) C-SCAN

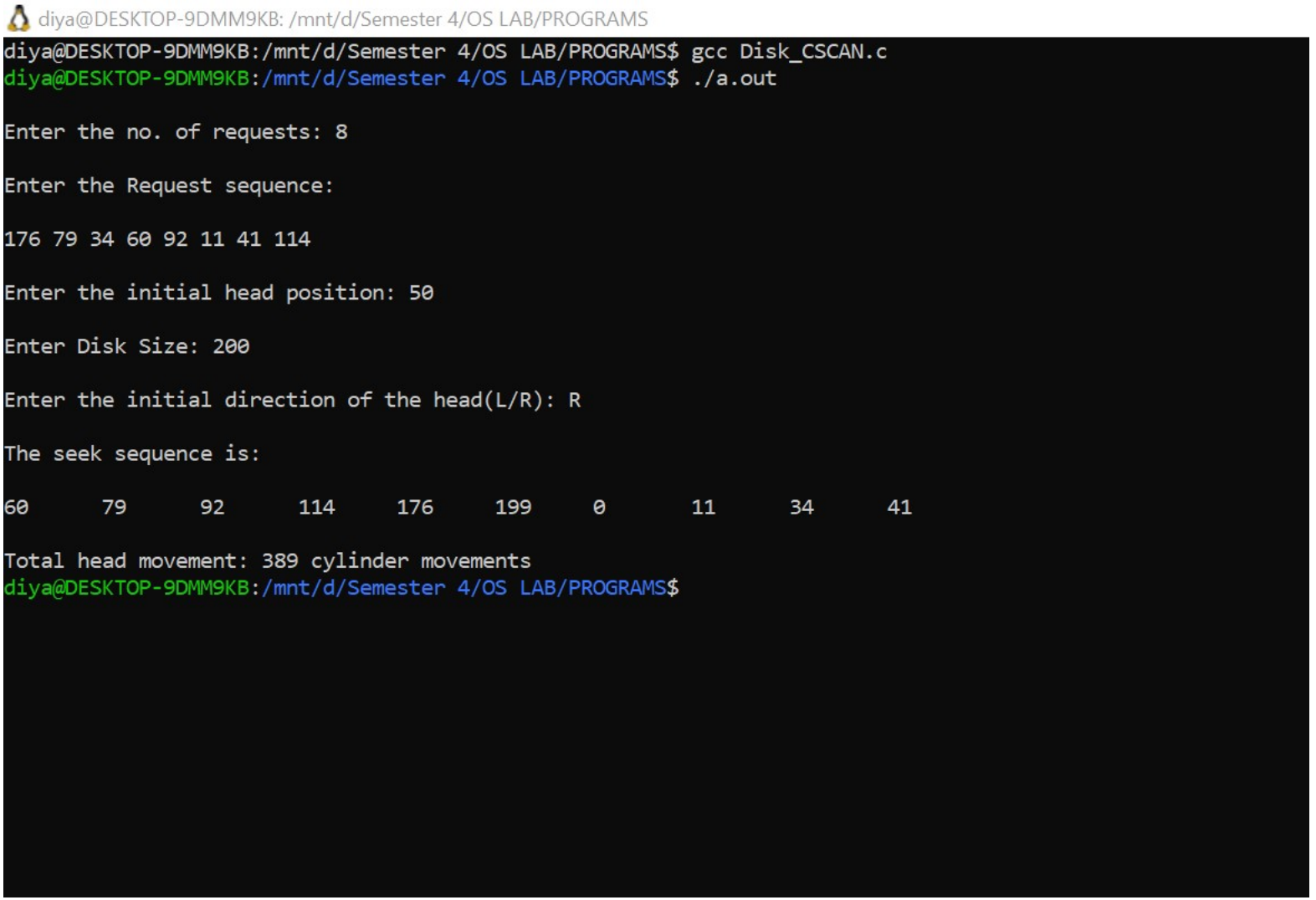
```c
//Write a C program to simulate C-SCAN disk scheduling algorithm

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

int seek_seq[10], size, seek = 0, count = 0;

void Sort(int a[], int n)   //Function for Sorting
{
    int temp;

    for(int i=0;i<n;i++)
    {
        for(int j=0;j<n-1;j++)
        {
            if(a[j] > a[j+1])
            {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}
```

```c
void CSCAN(int queue[], int n, int head, char dir)   //CSCAN Scheduling
{
    int diff , left[10], right[10], l = 0, r = 0;


    left[0] = 0;
    l++;

    right[0] = size - 1;
    r++;

    for(int i=0;i<n;i++)     //Inserting elements into left[] and right[] according to head
    {
        if(queue[i] < head)
            left[l++] = queue[i];
        else
            right[r++] = queue[i];
    }

    Sort(left,l);     //Sorting  left[]
    Sort(right,r);    //Sorting right[]

    if(dir == 'L')
    {
        for(int i=l-1;i>=0;i--)
        {
            diff = abs(head - left[i]);
            seek += diff;
            seek_seq[count++] = left[i];
            head = left[i];
        }
```

```
        for(int i=r-1;i>=0;i--)
        {
            diff = abs(head - right[i]);
            seek += diff;
            seek_seq[count++] = right[i];
            head = right[i];
        }
    }

    else
    {
        for(int i=0;i<r;i++)
        {
            diff = abs(head - right[i]);
            seek += diff;
            seek_seq[count++] = right[i];
            head = right[i];
        }

        for(int i=0;i<l;i++)
        {
            diff = abs(head - left[i]);
            seek += diff;
            seek_seq[count++] = left[i];
            head = left[i];
        }
    }

}
```

```c
void main()
{
    int queue[10],n,head;
    char dir;

    printf("\nEnter the no. of requests: ");
    scanf("%d",&n);

    printf("\nEnter the Request sequence:\n\n");
    for(int i=0;i<n;i++)
        scanf("%d",&queue[i]);

    printf("\nEnter the initial head position: ");
    scanf("%d",&head);

    printf("\nEnter Disk Size: ");
    scanf("%d",&size);

    printf("\nEnter the initial direction of the head(L/R): ");
    scanf(" %c", &dir);
    dir = toupper(dir);

    CSCAN(queue,n,head,dir);

    printf("\nThe seek sequence is:\n\n");
    for(int i=0;i<count;i++)
        printf("%d\t",seek_seq[i]);
    printf("\n\nTotal head movement: %d cylinder movements\n",seek);   //Printing total head movement
}
```

Output:


diya@DESKTOP-9DMM9KB: /mnt/d/Semester 4/OS LAB/PROGRAMS
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ gcc Disk_CSCAN.c
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$ ./a.out
Enter the no. of requests: 8
Enter the Request sequence:
176 79 34 60 92 11 41 114
Enter the initial head position: 50
Enter Disk Size: 200
Enter the initial direction of the head(L/R): R
The seek sequence is:
60 79 92 114 176 199 0 11 34 41
Total head movement: 389 cylinder movements
diya@DESKTOP-9DMM9KB:/mnt/d/Semester 4/OS LAB/PROGRAMS$