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

Code:

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

int disks;

void quicksort(int number[25], int first, int last)
{
   int i, j, pivot, temp;
   if (first < last)
   {
      pivot = first;

      i = first;
      j = last;
      while (i < j)
      {
         while (number[i] <= number[pivot] && i < last)
            i++;
         while (number[j] > number[pivot])
            j--;
         if (i < j)
         {
            temp = number[i];
            number[i] = number[j];
            number[j] = temp;
         }
      }
      temp = number[pivot];
      number[pivot] = number[j];
      number[j] = temp;
      quicksort(number, first, j - 1);
      quicksort(number, j + 1, last);
   }
}
void fcfs(int arr[],int src, int n)
{
   int sseq[20],i;
```

```
    sseq[0]=abs(arr[0]-src);
    for(i=1;i<n;i++)
    sseq[i]=abs(arr[i]-arr[i-1]);

    int sum=0;
    for(i=0;i<n;i++)
    sum+=sseq[i];

    printf("\nFCFS \nTotal seek sequenece: %d \nSeek Sequence: \n",sum);
    for(i=0;i<n;i++)
    printf("%d ",sseq[i]);
    printf("\n");
}

void cscan(int arr[], int src, int n)
{
    int i,sum=0,j,sseq[20];
    quicksort(arr, 0, n-1);
    int index;
    for (index = 0; index < n; index++) {
        if (arr[index] == src) {
            break;
        }
    }
    i=index+1;
    j=0;
    while(i<=n)
    {
        sseq[j]=abs(arr[i]-arr[i-1]);
        i++;
        j++;
    }
    sseq[j++]=abs(disks-arr[i-1]);
    i=0;
    sseq[j++]=abs(disks);
    while(i<index)
    {
        sseq[j++]=abs(arr[i]-arr[i-1]);
        i++;
    }
    for(i=0;i<(n+2);i++)
    sum+=sseq[i];
```

```
    printf("\nC-SCAN \nTotal seek sequenece: %d \nSeek Sequence: \n",sum);
    for(i=0;i<n+2;i++)
    printf("%d ",sseq[i]);
    printf("\n");

}
void scan(int arr[], int src, int n)
{
    int i,sum=0,j,sseq[20];
    quicksort(arr, 0, n-1);
    int index;
    for (index = 0; index < n; index++) {
        if (arr[index] == src) {
            break;
        }
    }
    i=index-1;
    j=0;
    while(i>=0)
    {
        sseq[j]=abs(arr[i]-arr[i+1]);
        i--;
        j++;
    }
    i=index+1;
    sseq[j++]=abs(arr[i++]-arr[0]);
    while(i<=n)
    {
        sseq[j++]=abs(arr[i]-arr[i-1]);
        i++;
    }
    for(i=0;i<n;i++)
    sum+=sseq[i];

    printf("\nSCAN \nTotal seek sequenece: %d \nSeek Sequence: \n",sum);
    for(i=0;i<n;i++)
    printf("%d ",sseq[i]);
    printf("\n");

}
void main()
{
    int source, arr[20],i,n,copy[20];
    printf("Enter numebr of disks: ");
```

```
    scanf("%d",&n);

    printf("\nEnter %d values: ",n);
    for(i=0;i<n;i++)
    scanf("%d",&arr[i]);

    printf("\nEnter source position: ");
    scanf("%d",&source);

    printf("\nEnter number disks: ");
    scanf("%d",&disks);

    for(i=0;i<n;i++)
    copy[i]=arr[i];

    arr[n]=source;
    copy[n]=arr[n];

    fcfs(copy , source , n);
    scan(copy , source , n);
    cscan(arr , source , n);

}
```

Output: