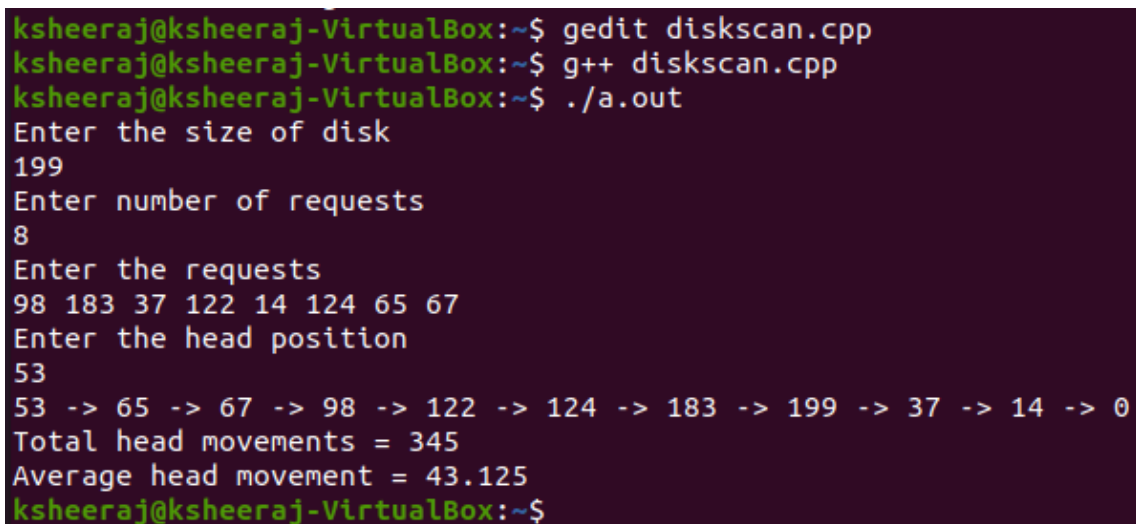


Disc scheduling algorithms

a) Scan

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int i,j,k,n,m,sum=0,x,y,h;
    cout<<"Enter the size of disk\n";
    cin>>m;
    cout<<"Enter number of requests\n";
    cin>>n;
    cout<<"Enter the requests\n";
    vector <int> a(n),b;
    for(i=0;i<n;i++){
        cin>>a[i];
    }
    for(i=0;i<n;i++){
        if(a[i]>m){
            cout<<"Error, Unknown position "<<a[i]<<"\n";
            return 0;
        }
    }
    cout<<"Enter the head position\n";
    cin>>h;
    int temp=h;
    a.push_back(h);
    a.push_back(m);
    a.push_back(0);
    sort(a.begin(),a.end());
    for(i=0;i<a.size();i++){
        if(h==a[i])
            break;
    }
    k=i;
    if(k<n/2){
        for(i=k;i<a.size();i++){
            b.push_back(a[i]);
        }
        for(i=k-1;i>=0;i--){
            b.push_back(a[i]);
        }
    }
}
```

```
    }  
}  
else{  
    for(i=k;i>=0;i--){  
        b.push_back(a[i]);  
    }  
    for(i=k+1;i<a.size();i++){  
        b.push_back(a[i]);  
    }  
}  
temp=b[0];  
cout<<temp;  
for(i=1;i<b.size();i++){  
    cout<<" -> "<<b[i];  
    sum+=abs(b[i]-temp);  
    temp=b[i];  
}  
cout<<'\\n';  
cout<<"Total head movements = "<< sum<<'\\n';  
cout<<"Average head movement = "<<(float)sum/n<<'\\n';  
return 0;  
}
```



```
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskscan.cpp  
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskscan.cpp  
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out  
Enter the size of disk  
199  
Enter number of requests  
8  
Enter the requests  
98 183 37 122 14 124 65 67  
Enter the head position  
53  
53 -> 65 -> 67 -> 98 -> 122 -> 124 -> 183 -> 199 -> 37 -> 14 -> 0  
Total head movements = 345  
Average head movement = 43.125  
ksheeraj@ksheeraj-VirtualBox:~$
```

Without giving manual input:

Request sequence = {176, 79, 34, 60, 92, 11, 41, 114}

Initial head position = 50

```
ksheeraj@ksheeraj-VirtualBox: ~  
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskscan.cpp  
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskscan.cpp  
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out  
Total number of seek operations = 226  
Seek Sequence is  
41  
34  
11  
0  
60  
79  
92  
114  
176  
ksheeraj@ksheeraj-VirtualBox:~$
```

b) C-Scan

```
#include<bits/stdc++.h>  
using namespace std;  
int main(){  
    int i,j,k,n,m,sum=0,x,y,h;  
    cout<<"Enter the size of disk\n";  
    cin>>m;  
    cout<<"Enter number of requests\n";  
    cin>>n;  
    cout<<"Enter the requests\n";  
    vector <int> a(n),b;  
    for(i=0;i<n;i++){  
        cin>>a[i];  
    }  
    for(i=0;i<n;i++){  
        if(a[i]>m){  
            cout<<"Error, Unknown position "<<a[i]<<"\n";  
            return 0;  
        }  
    }  
    cout<<"Enter the head position\n";  
    cin>>h;  
    int temp=h;  
    a.push_back(h);  
    a.push_back(m);  
    a.push_back(0);  
    sort(a.begin(),a.end());
```

```
for(i=0;i<a.size();i++){
    if(h==a[i])
        break;
}
k=i;
if(k<n/2){
    for(i=k;i<a.size();i++){
        b.push_back(a[i]);
    }
    for(i=0;i<=k-1;i++){
        b.push_back(a[i]);
    }
}
else{
    for(i=k;i>=0;i--){
        b.push_back(a[i]);
    }
    for(i=a.size()-1;i>=k+1;i--){
        b.push_back(a[i]);
    }
}
temp=b[0];
cout<<temp;
for(i=1;i<b.size();i++){
    cout<<" -> "<<b[i];
    sum+=abs(b[i]-temp);
    temp=b[i];
}
cout<<'\\n';
cout<<"Total head movements = "<< sum<<'\\n';
cout<<"Average head movement = "<<(float)sum/n<<'\\n';
return 0;
}
```

```
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskcscan.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskcscan.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Enter the size of disk
199
Enter number of requests
8
Enter the requests
98 183 37 122 14 124 65 67
Enter the head position
53
53 -> 65 -> 67 -> 98 -> 122 -> 124 -> 183 -> 199 -> 0 -> 14 -> 37
Total head movements = 382
Average head movement = 47.75
ksheeraj@ksheeraj-VirtualBox:~$
```

Without giving manual input:

Request sequence = {176, 79, 34, 60, 92, 11, 41, 114}

Initial head position = 50

```
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskcscan.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskcscan.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Initial position of head: 50
Total number of seek operations = 190
Seek Sequence is
60
79
92
114
176
199
0
11
34
41
ksheeraj@ksheeraj-VirtualBox:~$
```

c) Look

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int i,j,k,n,m,sum=0,x,y,h;
    cout<<"Enter the size of disk\n";
    cin>>m;
    cout<<"Enter number of requests\n";
    cin>>n;
    cout<<"Enter the requests\n";
```

```
vector <int> a(n), l;  
for(i=0; i<n; i++) {  
    cin >> a[i];  
}  
for(i=0; i<n; i++) {  
    if(a[i]>m) {  
        cout << "Error, Unknown position\n";  
        return 0;  
    }  
}  
cout << "Enter the head position\n";  
cin >> h;  
  
a.push_back(h);  
sort(a.begin(), a.end());  
  
for(i=0; i<a.size(); i++) {  
    if(h==a[i])  
        break;  
}  
k=i;  
if(k<n/2) {  
    for(i=k; i<a.size(); i++) {  
        l.push_back(a[i]);  
    }  
    for(i=k-1; i>=0; i--) {  
        l.push_back(a[i]);  
    }  
}  
else {  
    for(i=k; i>=0; i--) {  
        l.push_back(a[i]);  
    }  
    for(i=k+1; i<a.size(); i++) {  
        l.push_back(a[i]);  
    }  
}  
int temp=l[0];  
cout << temp;  
for(i=1; i<l.size(); i++) {
```

```
        cout<<" -> "<<l[i]<<' ';
        sum+=abs(l[i]-temp);
        temp=a[i];
    }
    cout<<'\n';
    cout<<"Total head movements = "<< sum<<'\n';

    return 0;
}
```

```
ksheeraj@ksheeraj-VirtualBox:~$ gedit disklook.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ disklook.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Enter the size of disk
199
Enter number of requests
8
Enter the requests
98 183 37 122 14 124 65 67
Enter the head position
53
53 -> 65 -> 67 -> 98 -> 122 -> 124 -> 183 -> 37 -> 14
Total head movements = 481
ksheeraj@ksheeraj-VirtualBox:~$
```

Without giving manual input:

Request sequence = {176, 79, 34, 60, 92, 11, 41, 114}

Initial head position = 50

```
ksheeraj@ksheeraj-VirtualBox:~$ gedit disklook.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ disklook.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Initial position of head: 50
Total number of seek operations = 291
Seek Sequence is
60
79
92
114
176
41
34
11
ksheeraj@ksheeraj-VirtualBox:~$
```

d) C-Look

```
#include<bits/stdc++.h>
using namespace std;
int main(){
    int i,j,k,n,m,sum=0,x,y,h;
    cout<<"Enter the size of disk\n";
    cin>>m;
    cout<<"Enter number of requests\n";
    cin>>n;
    cout<<"Enter the requests\n";
    vector <int> a(n),l;
    for(i=0;i<n;i++){
        cin>>a[i];
    }
    for(i=0;i<n;i++){
        if(a[i]>m){
            cout<<"Error, Unknown position\n";
            return 0;
        }
    }
    cout<<"Enter the head position\n";
    cin>>h;

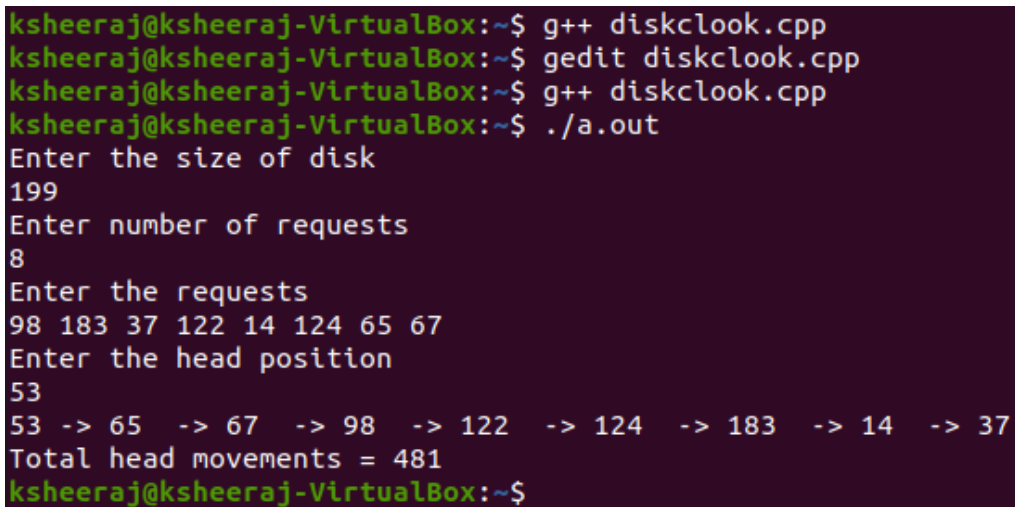
    a.push_back(h);
    sort(a.begin(),a.end());

    for(i=0;i<a.size();i++){
        if(h==a[i])
            break;
    }
    k=i;
    if(k<n/2){
        for(i=k;i<a.size();i++){
            l.push_back(a[i]);
        }
        for(i=0;i<k;i++){
            l.push_back(a[i]);
        }
    }
    else{
        for(i=k;i>=0;i--){
```



```
        l.push_back(a[i]);
    }
    for(i=a.size()-1;i>k;i--){
        l.push_back(a[i]);
    }
}
int temp=l[0];
cout<<temp;
for(i=1;i<l.size();i++){
    cout<<" -> "<<l[i]<<" ";
    sum+=abs(l[i]-temp);
    temp=a[i];
}
cout<<"\n";
cout<<"Total head movements = "<< sum<<"\n";

return 0;
}
```



```
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskclock.cpp
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskclock.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskclock.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Enter the size of disk
199
Enter number of requests
8
Enter the requests
98 183 37 122 14 124 65 67
Enter the head position
53
53 -> 65 -> 67 -> 98 -> 122 -> 124 -> 183 -> 14 -> 37
Total head movements = 481
ksheeraj@ksheeraj-VirtualBox:~$
```

Without giving manual input:

Request sequence = {176, 79, 34, 60, 92, 11, 41, 114}

Initial head position = 50

```
ksheeraj@ksheeraj-VirtualBox:~$ gedit diskclock.cpp
ksheeraj@ksheeraj-VirtualBox:~$ g++ diskclock.cpp
ksheeraj@ksheeraj-VirtualBox:~$ ./a.out
Initial position of head: 50
Total number of seek operations = 321
Seek Sequence is
60
79
92
114
176
11
34
41
ksheeraj@ksheeraj-VirtualBox:~$
```
