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19BCS049

Question 14 (a)

Write a program to implement the SCAN elevator disk scheduling algorithm. The program should give detail about each disk movement from starting head position (input from the user) and calculate average head movement.

Code :

```
#include<stdio.h>
#include<math.h>
#include <bits/stdc++.h>
using namespace std;
int main()
{
int n,head,i,j,k,seek=0,max,diff,curr;
float avg;
string direction;
vector<int> left, right;
printf("Enter the max range of disk\n");
scanf("%d",&max);
printf("Enter the size of queue request\n");
scanf("%d",&n);
int queue[n];
printf("Enter the queue of disk positions to be read\n");for(i=0;i<n;i++)
scanf("%d",&queue[i]);
printf("Enter the direction\n");
cin>>direction;
printf("Enter the initial head position\n");
scanf("%d",&head);
if (direction == "left")
left.push_back(0);
else if (direction == "right")
right.push_back(max - 1);
for (i = 0; i < n; i++)
{
if (queue[i] <= head)
left.push_back(queue[i]);
if (queue[i] > head)
right.push_back(queue[i]);
}
std::sort(left.begin(), left.end());
std::sort(right.begin(), right.end());
printf("Disk head moves from \t to \t with seek\n" );
int run = 2;
while (run-->0) {
if (direction == "left") {
for ( i = left.size() - 1; i >= 0; i--) {
curr = left[i];
diff = abs(curr - head);
```

```
printf("%d \t\t %d \t %d\n",head,curr,diff);seek += diff;
head = curr;
}
direction = "right";
}
else if (direction == "right") {
for ( i = 0; i < right.size(); i++) {
curr = right[i];
diff = abs(curr - head);
printf("%d \t\t %d \t %d\n",head,curr,diff);
seek += diff;
head = curr;
}
direction = "left";
}
}
printf("Total seek time is %d\n",seek);
avg=seek/(float)n;
printf("Average seek time is %f\n",avg);
return 0;
}
```

Output :

```
Enter the max range of disk
199
Enter the size of queue request
8
Enter the queue of disk positions to be read
14 34 56 77 86 34 97 150
Enter the direction
right
Enter the initial head position
54
Disk head moves from     to      with seek
54               56      2
56               77      21
77               86      9
86               97      11
97               150     53
150              198     48
198              34      164
34               34      0
34               14      20
Total seek time is 328
Average seek time is 41.000000
```

Question 14 (b)

Write a program to implement the LOOK elevator disk scheduling algorithm. The program should give detail about each disk movement from starting head position (input from

the user) and calculate average head movement.

Code :

```
#include<stdio.h>
#include<math.h>
#include <bits/stdc++.h>
using namespace std;
int main()
{
int n,head,i,j,k,seek=0,max,diff,curr;
float avg;
string direction;
vector<int> left, right;
printf("Enter the max range of disk\n");
scanf("%d",&max);
printf("Enter the size of queue request\n");
scanf("%d",&n);
int queue[n];
printf("Enter the queue of disk positions to be read\n");
for(i=0;i<n;i++)
scanf("%d",&queue[i]);
printf("Enter the direction\n");
cin>>direction;
printf("Enter the initial head position\n");
scanf("%d",&head);
for (i = 0; i < n; i++)
{
if (queue[i] <= head)
left.push_back(queue[i]);
if (queue[i] > head)
right.push_back(queue[i]);
}
std::sort(left.begin(), left.end());
std::sort(right.begin(), right.end());
printf("Disk head moves from \t to \t with seek\n" );
int run = 2;
while (run-->0) {
if (direction == "left") {
for ( i = left.size() - 1; i >= 0; i--) {curr = left[i];
diff = abs(curr - head);
printf("%d \t\t %d \t %d\n",head,curr,diff);
seek += diff;
head = curr;
}
direction = "right";
}
else if (direction == "right") {
for ( i = 0; i < right.size(); i++) {
curr = right[i];
diff = abs(curr - head);
printf("%d \t\t %d \t %d\n",head,curr,diff);
```

```
seek += diff;
head = curr;
}
direction = "left";
}
}
printf("Total seek time is %d\n",seek);
avg=seek/(float)n;
printf("Average seek time is %f\n",avg);
return 0;
}
```

Output :

```
Enter the max range of disk
199
Enter the size of queue request
8
Enter the queue of disk positions to be read
14 34 56 77 86 34 97 150
Enter the direction
right
Enter the initial head position
54
Disk head moves from     to      with seek
54               56      2
56               77      21
77               86      9
86               97      11
97               150     53
150              34      116
34               34      0
34               14      20
Total seek time is 232
Average seek time is 29.000000
```