Assignment No : 8

SCAN ALGORITHM

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
int queue[20], n, head, i, j, k, seek = 0, max, diff, temp, queue1[20], queue2[20];
int temp1 = 0, temp2 = 0;
float avg;
printf("Enter the max range of disk\n");
scanf("%d", &max);
printf("Enter the initial head position\n");
scanf("%d", &head);
printf("Enter the size of queue request\n");
scanf("%d", &n);
printf("Enter the queue of disk positions to be read\n");
for (i = 1; i <= n; i++)
{
scanf("%d", &temp);
if (temp >= head)
{
queue1[temp1] = temp;
temp1++;
}
else
{
queue2[temp2] = temp;
temp2++;
}
}
```

```
for (i = 0; i < temp1 - 1; i++)
{
for (j = i + 1; j < temp1; j++)
{
if (queue1[i] > queue1[j])
{
temp = queue1[i];
queue1[i] = queue1[j];
queue1[j] = temp;
}
}
}
for (i = 0; i < temp2 - 1; i++)
{
for (j = i + 1; j < temp2; j++)
{
if (queue2[i] > queue2[j])
{
temp = queue2[i];
queue2[i] = queue2[j];
queue2[j] = temp;
}
}
}
for (i = 1, j = 0; j < temp1; i++, j++)
queue[i] = queue1[j];
queue[i] = max;
queue[i + 1] = 0;
for (i = temp1 + 3, j = 0; j < temp2; i++, j++)
queue[i] = queue2[j];
queue[0] = head;
```

```
for (j = 0; j <= n + 1; j++)
{
diff = abs(queue[j + 1] - queue[j]);
seek += diff;
printf("Disk head moves from %d to %d with seek %d\n", queue[j], queue[j + 1], diff);
}
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
200
Enter the initial head position
50
Enter the size of queue request
8
Enter the queue of disk positions to be read
90
120
35
122
38
128
65
68
Disk head moves from 50 to 65 with seek 15
Disk head moves from 65 to 68 with seek 3
```

Disk head moves from 68 to 90 with seek 22

Disk head moves from 90 to 120 with seek 30

Disk head moves from 120 to 122 with seek 2

Disk head moves from 122 to 128 with seek 6

Disk head moves from 128 to 200 with seek 72

Disk head moves from 200 to 0 with seek 200

Disk head moves from 0 to 35 with seek 35

Disk head moves from 35 to 38 with seek 3

Total seek time is 388

Average seek time is 48.500000

FCFS ALGORITHM

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

int main() {
int queue[100], n, head, i, seek = 0;
float avg_seek=0;
printf("Enter the number of requests: ");
scanf("%d", &n);
printf("Enter the requests: ");
for (i = 0; i < n; i++) {
scanf("%d", &queue[i]);
}
printf("Enter the initial head position: ");
scanf("%d", &head);
for (i = 0; i < n; i++) {
seek += abs(head - queue[i]);
head = queue[i];
```

```
}
avg_seek=seek/n;
printf("Total number of seek operations: %d\n", seek);
printf("Average Seek Time is %f\n",avg_seek);
return 0;
}
```

Output

```
Enter the number of requests: 8
Enter the requests: 90
120
35
122
38
128
65
68
Enter the initial head position: 50
Total number of seek operations: 482
Average Seek Time is 60.000000
```

SSTF Algorithm

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

int main() {
int queue[100], queue2[100], q_size, head, seek=0, temp;
float avg;

printf("%s\n", "-----SSTF Disk Scheduling Algorithm-----");
printf("%s\n", "Enter the size of the queue");
scanf("%d", &q_size);

printf("%s\n", "Enter queue elements");
for(int i=0; i<q_size; i++){
scanf("%d",&queue[i]);
}

printf("%s\n","Enter initial head position");
scanf("%d", &head);

//get distance from head of elems in queue
for(int i=0; i<q_size; i++){
queue2[i] = abs(head-queue[i]);
}

//swap elems based on their distance from each other
for(int i=0; i<q_size; i++){
for(int j=i+1; j<q_size;j++){

if(queue2[i]>queue2[j]){
```

```
temp = queue2[i];
queue2[i]=queue[j];
queue2[j]=temp;

temp=queue[i];
queue[i]=queue[j];
queue[j]=temp;
}
}

}

for(int i=1; i<q_size; i++){
seek = seek+abs(head-queue[i]);
head = queue[i];
}

printf("\nTotal seek time is %d\t",seek);
avg = seek/(float)q_size;
printf("\nAverage seek time is %f\t", avg);

return 0;
}
```

Output

```
Enter the size of the queue
8
Enter queue elements
90
120
35
```

122

38

128

65

68

Enter initial head position

50

Total seek time is 108

Average seek time is 13.500000

LOOK ALGORITHM

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

int main()
{
int queue[100], n, head, i, j, seek = 0, direction;
float avg_seek=0;
printf("Enter the number of requests: ");
scanf("%d", &n);
printf("Enter the requests: ");
for (i = 0; i < n; i++) {
scanf("%d", &queue[i]);
}
printf("Enter the initial head position: ");
scanf("%d", &head);
printf("Enter the direction (0 for left, 1 for right): ");
scanf("%d", &direction);
for (i = 0; i < n; i++) {
```

```
for (j = i + 1; j < n; j++) {
if (queue[i] > queue[j]) {
int temp = queue[i];
queue[i] = queue[j];
queue[j] = temp;
}
}
}
int index;
for (i = 0; i < n; i++) {
if (queue[i] >= head) {
index = i;
break;
}
}
if (direction == 0) {
for (i = index - 1; i >= 0; i--) {
seek += abs(head - queue[i]);
head = queue[i];
}
for (i = index; i < n; i++) {
seek += abs(head - queue[i]);
head = queue[i];
}
}
else {
for (i = index; i < n; i++) {
seek += abs(head - queue[i]);
head = queue[i];
}
for (i = index - 1; i >= 0; i--) {
```

```
seek += abs(head - queue[i]);
head = queue[i];
}
}
avg_seek=seek/n;
printf("Total number of seek operations: %d\n", seek);
printf("Average Seek Time %f\n",avg_seek);
return 0;
}
```

Output

```
Enter the number of requests: 8
Enter the requests: 90
120
35
122
38
128
65
68
Enter the initial head position: 50
Enter the direction (0 for left, 1 for right): 1
Total number of seek operations: 171
Average Seek Time 21.000000
```