**EXPERIMENT - 38**

38. Design a C program to simulate SCAN disk scheduling algorithm.

#include <stdio.h>

#include <stdlib.h>

void sort(int arr[], int n) {

for (int i = 0; i < n - 1; i++)

for (int j = 0; j < n - i - 1; j++)

if (arr[j] > arr[j + 1]) {

int t = arr[j];

arr[j] = arr[j + 1];

arr[j + 1] = t;

}

}

void simulateSCAN(int requests[], int n, int head, int disk\_size, int direction) {

int total\_movement = 0;

int i;

sort(requests, n);

printf("\nRequest sequence in SCAN order:\n");

int left[100], right[100];

int l = 0, r = 0;

for (i = 0; i < n; i++) {

if (requests[i] < head)

left[l++] = requests[i];

else

right[r++] = requests[i];

}

if (direction == 1) {

for (i = 0; i < r; i++) {

printf("%d ", right[i]);

total\_movement += abs(head - right[i]);

head = right[i];

}

if (head != disk\_size - 1) {

total\_movement += abs(disk\_size - 1 - head);

head = disk\_size - 1;

}

for (i = l - 1; i >= 0; i--) {

printf("%d ", left[i]);

total\_movement += abs(head - left[i]);

head = left[i];

}

} else {

for (i = l - 1; i >= 0; i--) {

printf("%d ", left[i]);

total\_movement += abs(head - left[i]);

head = left[i];

}

if (head != 0) {

total\_movement += abs(head - 0);

head = 0;

}

for (i = 0; i < r; i++) {

printf("%d ", right[i]);

total\_movement += abs(head - right[i]);

head = right[i];

}

}

printf("\nTotal head movement: %d cylinders\n", total\_movement);

}

int main() {

int requests[100], n, head, disk\_size, direction;

printf("Enter total number of disk requests: ");

scanf("%d", &n);

printf("Enter the disk request sequence:\n");

for (int i = 0; i < n; i++)

scanf("%d", &requests[i]);

printf("Enter initial head position: ");

scanf("%d", &head);

printf("Enter disk size (e.g., 200): ");

scanf("%d", &disk\_size);

printf("Enter head movement direction (1 for high →, 0 for low ←): ");

scanf("%d", &direction);

simulateSCAN(requests, n, head, disk\_size, direction);

return 0;

}

SAMPLE INPUT:

Enter total number of disk requests: 6

Enter the disk request sequence:

98 183 37 122 14 124

Enter initial head position: 53

Enter disk size (e.g., 200): 200

Enter head movement direction (1 for high →, 0 for low ←): 1

SAMPLE OUTPUT:

Request sequence in SCAN order:

98 122 124 183 37 14

Total head movement: 331 cylinders