**Disk Scheduling Algorithm 33185**

#include <stdio.h>

#include <stdlib.h>

#include <math.h>

void SSTF(int requests[], int head, int n)

{

int seek = 0, diff, completed = 0;

int visited[n], sequence[n];

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

visited[i] = 0;

}

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

int min = 1e9, index = -1;

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

{

if (!visited[j]) {

diff = abs(requests[j] - head);

if (diff < min) {

min = diff;

index = j;

}

}

}

seek += abs(requests[index] - head);

head = requests[index];

sequence[completed++] = head;

visited[index] = 1;

}

printf("SSTF Total Seek Time: %d\n", seek);

printf("SSTF Seek Sequence: ");

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

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

}

printf("\n");

}

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

int seek = 0, completed = 0;

int sequence[n + 2], temp[n + 2];

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

temp[i] = requests[i];

}

temp[n] = 0;

temp[n + 1] = disk\_size - 1;

n += 2;

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

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

if (temp[i] > temp[j]) {

int t = temp[i];

temp[i] = temp[j];

temp[j] = t;

}

}

}

int pos;

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

if (temp[i] >= head) {

pos = i;

break;

}

}

if (direction == 1) {

for (int i = pos; i < n; i++) {

sequence[completed++] = temp[i];

}

for (int i = pos - 1; i >= 0; i--) {

sequence[completed++] = temp[i];

}

} else {

for (int i = pos - 1; i >= 0; i--) {

sequence[completed++] = temp[i];

}

for (int i = pos; i < n; i++) {

sequence[completed++] = temp[i];

}

}

for (int i = 1; i < completed; i++) {

seek += abs(sequence[i] - sequence[i - 1]);

}

printf("SCAN Total Seek Time: %d\n", seek);

printf("SCAN Seek Sequence: ");

for (int i = 0; i < completed; i++) {

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

}

printf("\n");

}

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

int seek = 0, completed = 0;

int sequence[n + 1], temp[n];

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

temp[i] = requests[i];

}

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

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

if (temp[i] > temp[j]) {

int t = temp[i];

temp[i] = temp[j];

temp[j] = t;

}

}

}

int pos;

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

if (temp[i] >= head) {

pos = i;

break;

}

}

for (int i = pos; i < n; i++) {

sequence[completed++] = temp[i];

}

for (int i = 0; i < pos; i++) {

sequence[completed++] = temp[i];

}

for (int i = 1; i < completed; i++) {

seek += abs(sequence[i] - sequence[i - 1]);

}

printf("C-LOOK Total Seek Time: %d\n", seek);

printf("C-LOOK Seek Sequence: ");

for (int i = 0; i < completed; i++) {

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

}

printf("\n");

}

int main() {

int n, head, disk\_size, direction;

printf("Enter the number of requests: ");

scanf("%d", &n);

int requests[n];

printf("Enter the requests:\n");

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

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

}

printf("Enter the initial head position: ");

scanf("%d", &head);

printf("Enter the disk size: ");

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

printf("Enter the direction for SCAN (1 for high, 0 for low): ");

scanf("%d", &direction);

SSTF(requests, head, n);

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

CLOOK(requests, head, n, disk\_size);

return 0;

}

Test Case 1:

Input:

Number of requests: 5

Requests: 98, 183, 37, 122, 14

Initial head position: 53

Disk size: 200

Direction for SCAN: 1 (high)

Output:

SSTF Total Seek Time: 236

SSTF Seek Sequence: 37 14 98 122 183

SCAN Total Seek Time: 322

SCAN Seek Sequence: 98 122 183 199 37 14 0

C-LOOK Total Seek Time: 215

C-LOOK Seek Sequence: 98 122 183 14 37

Test Case 2:

Input:

Number of requests: 6

Requests: 55, 58, 39, 18, 90, 160

Initial head position: 50

Disk size: 200

Direction for SCAN: 0 (low)

Output:

SSTF Total Seek Time: 202

SSTF Seek Sequence: 55 58 39 18 90 160

SCAN Total Seek Time: 188

SCAN Seek Sequence: 39 18 0 55 58 90 160

C-LOOK Total Seek Time: 147

C-LOOK Seek Sequence: 55 58 90 160 18 39

Test Case 3:

Input:

Number of requests: 4

Requests: 23, 89, 132, 42

Initial head position: 50

Disk size: 150

Direction for SCAN: 1 (high)

Output:

SSTF Total Seek Time: 110

SSTF Seek Sequence: 42 23 89 132

SCAN Total Seek Time: 194

SCAN Seek Sequence: 89 132 149 42 23 0

C-LOOK Total Seek Time: 128

C-LOOK Seek Sequence: 89 132 23 42