#include <stdio.h>

#include <stdlib.h>

#include <stdbool.h>

void scan(int requests[], int n, int head, int direction)

{

int i,j;

int total\_movement = 0;

int current\_position = head;

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

{

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

{

if (requests[j] > requests[j + 1])

{

int temp = requests[j];

requests[j] = requests[j + 1];

requests[j + 1] = temp;

}

}

}

int index = 0;

while (index < n && requests[index] < head)

{

index++;

}

if (direction == 1)

{

for (i = index; i < n; i++)

{

total\_movement += abs(current\_position - requests[i]);

current\_position = requests[i];

printf("Served request: %d\n", requests[i]);

}

total\_movement += abs(current\_position - 100);

current\_position = 100;

for ( i = n - 1; i >= 0; i--)

{

if (requests[i] < 100)

{

total\_movement += abs(current\_position - requests[i]);

current\_position = requests[i];

printf("Served request: %d\n", requests[i]);

}

}

}

else

{

for (i = index - 1; i >= 0; i--)

{

total\_movement += abs(current\_position - requests[i]);

current\_position = requests[i];

printf("Served request: %d\n", requests[i]);

}

total\_movement += abs(current\_position - 0);

current\_position = 0;

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

{

if (requests[i] > 0)

{

total\_movement += abs(current\_position - requests[i]);

current\_position = requests[i];

printf("Served request: %d\n", requests[i]);

}

}

}

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

}

int main()

{

int n, head,direction;

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

scanf("%d", &n);

int requests[n];

printf("Enter the requests : ");

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

{

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

}

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

scanf("%d", &head);

printf("Enter the direction of movement for SCAN (1 for right, 0 for left): ");

scanf("%d", &direction);

scan(requests, n, head, direction);

return 0;

}

OUTPUT

Enter the number of requests : 5

Enter the requests : 10 50 30 20 40

Enter the initial head position: 35

Enter the direction of movement for SCAN (1 for right, 0 for left): 1

Served request: 40

Served request: 50

Served request: 50

Served request: 40

Served request: 30

Served request: 20

Served request: 10

Total head movement: 155