#include <stdio.h>

#define MAX 3

typedef struct queue {

int irear;

int ifront;

int aiframe[MAX];

} queue;

void fnFIFO(int arr[], int size) {

queue q;

q.irear = 0;

q.ifront = 0;

int pg = 0;

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

q.aiframe[i] = -1;

}

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

int flag = 0;

for (int j = 0; j < MAX; j++) {

if (q.aiframe[j] == arr[i]) {

flag = 1;

break;

}

}

if (flag == 0) {

q.aiframe[q.irear] = arr[i]; // Replace the page at the rear position

pg++; // Increment the page fault count

q.irear = (q.irear + 1) % MAX; // Update the rear in a circular manner

}

printf("Frame: ");

for (int j = 0; j < MAX; j++) {

if (q.aiframe[j] != -1) {

printf("%d ", q.aiframe[j]);

} else {

printf("- ");

}

}

printf("\n");

}

printf("Total Number of Page Faults: %d\n", pg);

}

int main() {

int size;

printf("Enter the size of the reference string: ");

scanf("%d", &size);

int arr[size];

printf("Enter the reference string elements:\n");

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

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

}

fnFIFO(arr, size);

return 0;

}