LAB-4:

WAP to implement stack using queues.

SHREYA S RUDAGI
1BM22CS267

```c
#include <stdbool.h>
#include <stdlib.h>

typedef struct {
    int* data;
    int front;
    int rear;
    int size;
} Queue;

typedef struct {
    Queue* q1;
    Queue* q2;
} MyStack;

Queue* createQueue(int size) {
    Queue* queue = (Queue*)malloc(sizeof(Queue));
    queue->data = (int*)malloc(size * sizeof(int));
    queue->front = queue->rear = -1;
    queue->size = size;
    return queue;
}

void enqueue(Queue* queue, int value) {
    if (queue->rear == -1) {
        queue->front = queue->rear = 0;
    } else {
        queue->rear = (queue->rear + 1) % queue->size;
    }
    queue->data[queue->rear] = value;
}

int dequeue(Queue* queue) {
    int value = queue->data[queue->front];
    if (queue->front == queue->rear) {
        queue->front = queue->rear = -1;
    } else {
        queue->front = (queue->front + 1) % queue->size;
    }
    return value;
}

bool isEmpty(Queue* queue) {
    return queue->front == -1;
}

MyStack* myStackCreate() {
    MyStack* stack = (MyStack*)malloc(sizeof(MyStack));
    stack->q1 = createQueue(1000); // Adjust the size as needed
    stack->q2 = createQueue(1000);
    return stack;
}

void myStackPush(MyStack* obj, int x) {
    enqueue(obj->q1, x);
```

```
}

int myStackPop(MyStack* obj) {
    if (isEmpty(obj->q1)) {
        return -1; // Stack is empty
    }

    while (obj->q1->front != obj->q1->rear) {
        enqueue(obj->q2, dequeue(obj->q1));
    }

    int poppedValue = dequeue(obj->q1);

    // Swap q1 and q2
    Queue* temp = obj->q1;
    obj->q1 = obj->q2;
    obj->q2 = temp;

    return poppedValue;
}

int myStackTop(MyStack* obj) {
    if (isEmpty(obj->q1)) {
        return -1; // Stack is empty
    }

    while (obj->q1->front != obj->q1->rear) {
        enqueue(obj->q2, dequeue(obj->q1));
    }

    int topValue = dequeue(obj->q1);
    enqueue(obj->q2, topValue);

    // Swap q1 and q2
    Queue* temp = obj->q1;
    obj->q1 = obj->q2;
    obj->q2 = temp;

    return topValue;
}

bool myStackEmpty(MyStack* obj) {
    return isEmpty(obj->q1);
}

void myStackFree(MyStack* obj) {
    free(obj->q1->data);
    free(obj->q1);
    free(obj->q2->data);
    free(obj->q2);
    free(obj);
}
```

Testcase Result

Accepted Runtime: 0 ms

• Case 1

Input

```
["MyStack","push","push","top","pop","empty"]
```

```
[[],[1],[2],[],[],[]]
```

Output

```
[null,null,null,2,2,false]
```

Expected

```
[null,null,null,2,2,false]
```

• 232. Implement Queue using Stacks

Status	Language	Runtime	Memory	Notes
Accepted a few seconds ago	C	0 ms	6.9 MB	