

Problem Definition

In this recitation, you mainly implement an Queue like data structure using two stacks. You complete enqueue and dequeue functions in SQueue data structure. SQueue data structure consists of main and temp stacks, enqueue, dequeue and printQueue functions as below:

Code Listing 1: SQueue Class

```
#include <stack>

using namespace std;

class SQueue
{
    private:
        stack<int> main;
        stack<int> temp;

    public:
        void enqueue(int);
        void dequeue();
        void printQueue();
};
```

You should complete 'enqueue' and 'dequeue' functions in the code file. You should do following transformation in these functions.

- void enqueue(int x):
 - While stack main is not empty, push all items from stack main to stack temp
 - Push x to stack main
 - Push all items from stack temp to stack main
- void dequeue():
 - If stack main is empty, print(cout) "Queue is empty"
 - Pop an item from stack main(x) and print "x is dequeued"

Note: Please don't change SQueue.h and main.cpp file. However, you can add local variables in enqueue and dequeue functions. These local variables can only be 'int'.

An example scenario is shown on the next page.

1 Example

Terminal Screen

```
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:A
Enqueued element:1
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:A
Enqueued element:3
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:A
Enqueued element:5
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:D
1 is dequeued
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
```

E: Exit

Enter a choice A,D,P,E:P

3 5

Choose an operation

A: Enqueue an element to the queue

D: Dequeue an element from the queue

P: Print the queue

E: Exit

Enter a choice A,D,P,E:A

Enqueued element:5

Choose an operation

A: Enqueue an element to the queue

D: Dequeue an element from the queue

P: Print the queue

E: Exit

Enter a choice A,D,P,E:P

3 5 5

Choose an operation

A: Enqueue an element to the queue

D: Dequeue an element from the queue

P: Print the queue

E: Exit

Enter a choice A,D,P,E:D

3 is dequeued

Choose an operation

A: Enqueue an element to the queue

D: Dequeue an element from the queue

P: Print the queue

E: Exit

Enter a choice A,D,P,E:D

5 is dequeued

Choose an operation

A: Enqueue an element to the queue

D: Dequeue an element from the queue

P: Print the queue
E: Exit
Enter a choice A,D,P,E:D
5 is dequeued
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:D
Queue is empty
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:A
Enqueued element:1
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:A
Enqueued element:2
Choose an operation
A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:P
1 2
Choose an operation

A: Enqueue an element to the queue
D: Dequeue an element from the queue
P: Print the queue
E: Exit
Enter a choice A,D,P,E:

Submission Rules

- Make sure you write your name and number in all of the files of your project, in the following format:

```
/* @Author
```

```
Student Name: <student_name>
```

```
Student ID : <student_id>
```

```
Date: <date> */
```

- Use comments wherever necessary in your code to explain what you did.
- Your program will be checked by using **Calico**(<https://bitbucket.org/uyar/calico>) automatic checker.
- Do not share any code or text that can be submitted as a part of an assignment (discussing ideas is okay).
- Only electronic submissions through Ninova will be accepted no later than deadline.
- You may discuss the problems at an abstract level with your classmates, but you should not **share or copy code** from your classmates or from the Internet. You should submit your **own, individual** homework.
- Academic dishonesty, including cheating, plagiarism, and direct copying, is unacceptable.
- If you have any question about the recitation, you can send e-mail to Yunus Emre Cebeci(cebeci16@itu.edu.tr).
- Note that **YOUR CODES WILL BE CHECKED WITH THE PLAGIARISM TOOLS!**



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