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SE-C Comp, Viit, Pune

CODE:

```
#include<iostream>
#include<exception>
using namespace std;

class EmptyStackException:public exception{
public:
    const char*what()const throw(){
        return "EmptyStackException";
    }
};

class FullStackException:public exception{
public:
    const char*what()const throw(){
        return "FullStackException";
    }
};

template<class T>
class Stack{
private:
    T *stk;
    int stk_size;
    int tos;
public:
    Stack(int stk_size=10){
        if(stk_size<0)
            throw std::bad_array_new_length();
        stk=new T[stk_size];
        this->stk_size=stk_size;
        tos=-1;
    }
    void push(T element);
    T pop();
    void printStack();
    bool isFull(){
        return tos==stk_size-1;
    }
    bool isEmpty(){
        return tos== -1;
    }
    ~Stack(){
        delete stk;
        cout<<"destructor called\n";
    }
};

template<class T>
void Stack<T>::push(T element){
    if(isFull()){
        throw FullStackException();
    }
}
```

```

        else{
            *(stk(++tos))=element;
        }
    }
template<class T>
T Stack<T>::pop(){
    if(isEmpty()){
        throw EmptyStackException();
    }
    return *(stk+(tos--));
}

template<class T>
void Stack<T>::printStack(){
    int tempTos=tos;
    while(tempTos>-1){
        cout<<*(stk+(tempTos--))<<" ";
    }
    cout<<endl;
}

int main(){
    Stack<int> myStack(9);
    for(int i=1;i<=11;i++){
        cout<<"Try to add Add:"<<i<<endl;
        try{
            myStack.push(i);
            myStack.printStack();
        }catch(exception& e){
            cout<<e.what()<<" was thrown\n";
        }
    }
    myStack.printStack();
    for(int i=1;i<=11;i++){
        try{
            cout<<"Pop:"<<myStack.pop()<<endl;
        }catch(exception& e){
            cout<<e.what()<<" was thrown"<<endl;
        }
    }
    return 0;
}

```

Output:

```
rajrahane@visraj-lenovo-g500: ~/Desktop/c++/Lab1/FDS/Stack
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Stack$ g++ -o stack stack.cpp
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Stack$ ./stack
Try to add Add:1
1
Try to add Add:2
2 1
Try to add Add:3
3 2 1
Try to add Add:4
4 3 2 1
Try to add Add:5
5 4 3 2 1
Try to add Add:6
6 5 4 3 2 1
Try to add Add:7
7 6 5 4 3 2 1
Try to add Add:8
8 7 6 5 4 3 2 1
Try to add Add:9
9 8 7 6 5 4 3 2 1
Try to add Add:10
FullStackException was thrown
Try to add Add:11
FullStackException was thrown
9 8 7 6 5 4 3 2 1
Pop:9
Pop:8
Pop:7
Pop:6
Pop:5
Pop:4
Pop:3
Pop:2
Pop:1
EmptyStackException was thrown
EmptyStackException was thrown
destructor called
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Stack$
```