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| Ex.No: 06 | ADT STACK |
| Date:31.08.19 | |

Aim:

To write a java console application to design a java interface for ADT Stack. Implement this interface using array and to verify the implementation by pushing a string.

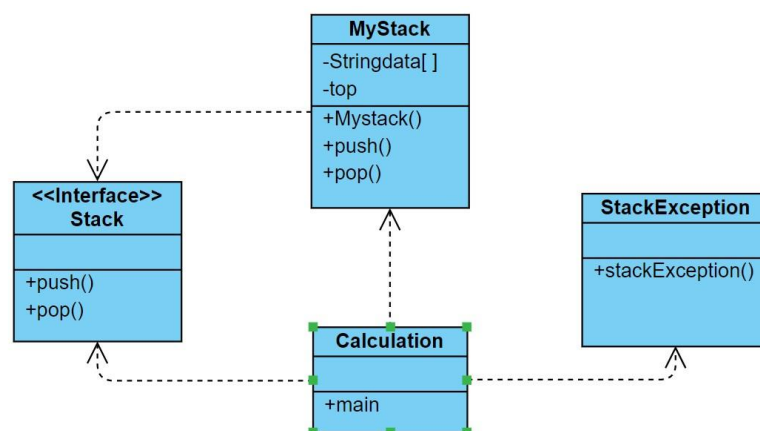
Requirement:

Design a java interface for ADT Stack.
 Implement this interface using array.
 Provide necessary exception handling in both the implementation.
 Verify the implementation by pushing a string data.

Algorithm:

Step 1: Create a mystack package.
 Step 2: Create a separate class for calculation, mystack and stackexception.
 Step 3: Create an interface class stack and implement it to all other class.
 Step 4: Create the exception for separate stackexception in the interface stack.
 Step 5: Create a public void push() and string pop() and throw stack exception.
 Step 6: Display the results.

Class Diagram:



Program:

Stack.java

```
/*
 * Program to represent interface stack
 * By Faizul
 * faizulsmart10@gmail.com
 */

package mystack;

public interface Stack {
    public void push(String v) throws StackException;
    public String pop() throws StackException;
}
```

StackException.java

```
/*
 * Program to represent StackException
 * By Faizul
 * faizulsmart10@gmail.com
 */

package mystack;

public class StackException extends Exception {

    public StackException(String m)
    {
        super(m);
    }
}
```

MyStack.java

```
/*
 * Program to represent Push and Pop operation
 * By Faizul
 * faizulsmart10@gmail.com
 */

package mystack;

public class MyStack implements Stack {
    private String data[];
```

```

private int top;

public MyStack(int s)
{
    top=-1;
    data=new String[s];
}

@Override
public void push(String v) throws StackException
{
    if(top>=(data.length-1))
    {
        throw new StackException("Stack Full: It is already having "+(top+1)+" elements");
    }
    top=top+1;
    data[top]=v;
}

@Override
public String pop()throws StackException
{
    String result;
    if(top<0)
    {
        throw new StackException("Stack is empty");
    }
    result=data[top];
    top=top-1;
    return result;
}
}

```

Calculation.java

```

/*
 * Program to represent Push and Pop operation
 * By Faizul
 * faizulsmart10@gmail.com
 */

package mystack;

import java.util.*;

public class Calculation {

    public static void main(String[] args) {

```

```
String value1;  
int option;  
Stack st;
```

```
Scanner sc=new Scanner(System.in);  
st=new MyStack(5);
```

```
while(true)  
{  
    try  
    {  
        System.out.println("1. Push a String");  
        System.out.println("2. Pop a String");  
        System.out.println("3. Exit");  
        System.out.print("Enter your choice:");  
  
        option=sc.nextInt();  
        switch(option)  
        {  
            case 1:  
                System.out.print("Enter a String:");  
                value1=sc.next();  
                st.push(value1);  
                System.out.println("Push completed.");  
                break;  
            case 2:  
                value1=st.pop();  
                System.out.printf("Stack top value=%s\n",value1);  
                break;  
            default:  
                System.out.print("Please enter a valid string !!!");  
        }  
  
        if(option==3)  
        {  
            System.out.print("Thankyou for using stack application !!!");  
            break;  
        }  
  
    }catch(StackException e1)  
    {  
        System.out.println("Error:"+e1.getMessage());  
    }catch(NumberFormatException e2)  
    {  
        System.out.println("Error:"+e2.getMessage());  
    }  
}
```

Output:

1. Push a String

2. Pop a String

3. Exit

Enter your choice:1

Enter a String:akhshy

Push completed.

1. Push a String

2. Pop a String

3. Exit

Enter your choice:1

Enter a String:abhijith

Push completed.

1. Push a String

2. Pop a String

3. Exit

Enter your choice:1

Enter a String:faizul

Push completed.

1. Push a String

2. Pop a String

3. Exit

Enter your choice:1

Enter a String:sanjai

Push completed.

1. Push a String

2. Pop a String

3. Exit

Enter your choice:2

Stack top value=sanjai

1. Push a String

2. Pop a String

3. Exit

Enter your choice:3

Please enter a valid string !!!Thankyou for using stack application !!!

Result:

Thus the java console application for performing the string operation is verified with its output.