EXP NO:06	**ADT STACK**
DATE:13.09.19	

Aim:

To develope a java interface for ADT Stack and to implement this using Array.

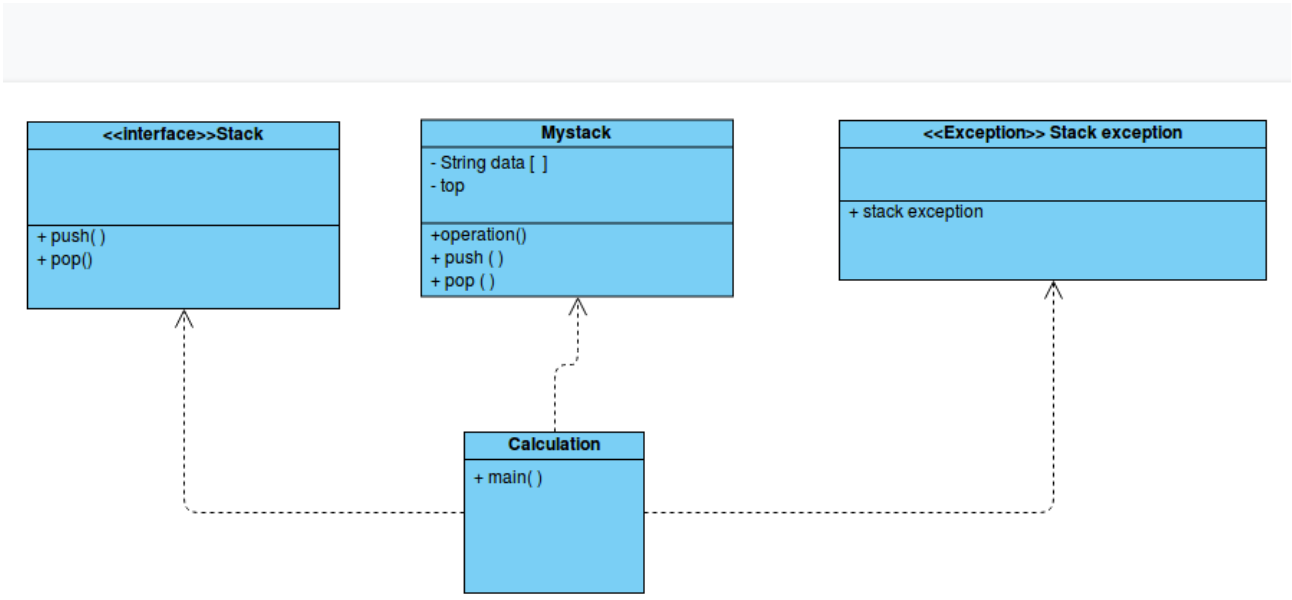
Requriment:

1.Knowledge of Push and Pop of data.
2.Exception Handling
3.Handling of Array
4.Interface implemention.
5.Calculation for Stack.

Algorithm:

Step1: Declare a package My Stack.
Step2: Declare a class,calculation,Mystack,Stack and StackException.
Step3: Define stack exception with string int.
Step4: Define the interface stack by using throws stack exception.
Step5: Display result.

Class diagram:



Program:

```
/****
 * Program for stackexception


 * @author RAJAMANICKAM A
 *  rajapandidevi1997@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;
 }

}
```

```
/****
 * Program for stackexception


 * @author RAJAMANICKAM A
 *  rajapandidevi1997@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 number !!!");
                }

                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());
                }
                }
        }
}

/****
 * Program for stackexception


 * @author RAJAMANICKAM A
 *  rajapandidevi1997@gmail.com
 */
package mystack;

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

/****
 * Program for stackexception


 * @author RAJAMANICKAM A
 *  rajapandidevi1997@gmail.com
 */
package mystack;

public class StackException extends Exception {

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

OUTPUT:

```
1. Push a string
2. Pop a string
3. Exit
Enter your choice:1
Enter a string:raja
Push completed.
1. Push a string
2. Pop a string
```

```
3. Exit
Enter your choice:1
Enter a string:ammu
Push completed.
1. Push a string
2. Pop a string
3. Exit
Enter your choice:1
Enter a string:raghav
Push completed.
1. Push a string
2. Pop a string
3. Exit
Enter your choice:2
Stack top value=raghav
1. Push a string
2. Pop a string
3. Exit
```

Result:

Thus program for ADT stack is successfully created by Java program.