EX: 06	ADT STACK
31-08-2019	

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.

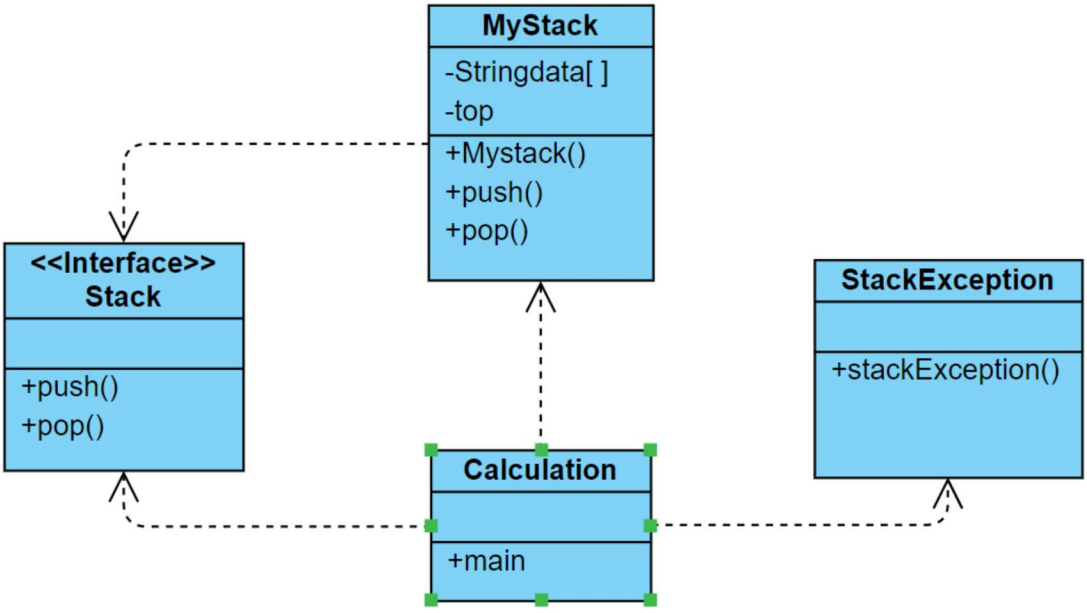
Step 3: Create an interface class stack and implement it to all other class.

Step 4: Create the exception for seperate 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:

Calculation.java

```
/*created by kaarthikeyan
 * email:gk81299@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());
}}
}
}
```

MyStack.java

```
/*created by kaarthikeyan
 * email:gk81299@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;
}
}
```

Stack.java

```
/*created by kaarthikeyan
 * email:gk81299@gmail.com
 *
 */
package mystack;
public interface Stack {
public void push(String v) throws StackException;
public String pop() throws StackException;
```

```
}
```

StackException.java

```
/*created by kaarthikeyan
 * email:gk81299@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:Name
Push completed.
1. Push a String
2. Pop a String
3. Exit
Enter your choice:1
Enter a String:Class
Push completed.
1. Push a String
2. Pop a String
```

3. Exit

Enter your choice:2

Stack top value=Class

1. Push a String

2. Pop a String

3. Exit

Enter your choice:2

Stack top value=Name

1. Push a String

2. Pop a String

3. Exit

Enter your choice:3

Thanks for using the application!

Result:

Thus the java console application for performing the string operation to push and pop using arraylist and thus the output is verified.