

## Lab Program - 6

6) a) **Design, Develop and Implement a java program to implement a stack using generic class and methods.**

```
public class Stack<E> {

    E stck[];
    int top;
    final int SIZE = 10;

    @SuppressWarnings("unchecked")
    Stack()
    {
        stck = (E[]) new Object [SIZE];
        top = -1;
    }

    void push(E item)
    {
        if (top == SIZE-1)
            System.out.println("Stack is full");
        else
            stck[++top] = item;
    }

    E pop()
    {
        if(top < 0) {
            System.out.println("Stack underflow");
            return null;
        }
        else
            return stck[top--];
    }
}

import java.util.Scanner;

public class TestStack {

    public static void main(String[] args) {

        Stack<Integer> mystack1 = new Stack<Integer>();
        Stack<Double> mystack2 = new Stack<Double>();
        Scanner s = new Scanner(System.in);

        System.out.println("Enter elements into the Integer stack");

        for(int i=0;i<5;i++)
        {
            int n = s.nextInt();
            mystack1.push(n);
        }
    }
}
```

```

    }

    System.out.println("Enter elements into the Double stack");
    for(int i=0;i<5;i++)
    {
        double m = s.nextDouble();
        mystack2.push(m);
    }
    System.out.println("Elements of stack 1 ");
    for(int i=0;i<5;i++)
        System.out.println(mystack1.pop());

    System.out.println("Elements of stack 2 ");
    for(int i=0;i<5;i++)
        System.out.println(mystack2.pop());

    s.close();

}

}

```

**6) b) Design, Develop and Implement a Java program to read a string from the keyboard using an appropriate UI and do the following**

- i. Extract the middle character of the string**
- ii. Check whether the string entered is palindrome or not**
- iii. Counting the number of vowels in the string**
- iv. Counting the total number of characters in this string.**

```

package swings;
import javax.swing.*.*;
import java.awt.event.*;
public class StringOperations implements ActionListener {
    JTextField tf1,tf2,tf3;
    JButton b1,b2,b3,b4;
    JLabel l1,l2;
    StringOperations(){
        JFrame f= new JFrame();
        tf1=new JTextField();
        tf1.setBounds(80,80,150,20);
        tf2=new JTextField();
        tf2.setBounds(80,130,200,20);
        tf2.setEditable(false);
        l1=new JLabel("Enter text");
        l1.setBounds(50,50, 100,30);
        l2=new JLabel("Result");
        l2.setBounds(50,100,100,30);
        b1=new JButton("Find Mid Character");
        b1.setBounds(50,200,250,50);
        b2=new JButton("Check Palindrome");
        b2.setBounds(320,200,250,50);
        b3=new JButton("Count Vowels");
        b3.setBounds(50,300,250,50);
        b4=new JButton("Find length");
    }
}

```

```

b4.setBounds(320,300,250,50);
b1.addActionListener(this);
b2.addActionListener(this);
b3.addActionListener(this);
b4.addActionListener(this);
f.add(tf1);
f.add(tf2);
f.add(l1);
f.add(l2);
f.add(b1);
f.add(b2);
f.add(b3);
f.add(b4);
f.setSize(650,450);
f.setLayout(null);
f.setVisible(true);
}
public void actionPerformed(ActionEvent e) {
String s=tf1.getText();
int length;
length = s.length();
if(e.getSource()==b1) {
int mid;
mid = length/2;
if(length%2 != 0)
tf2.setText("The mid character is "+s.charAt(mid));
else
tf2.setText("The middle characters are "+s.charAt(mid-1)+" "+s.charAt(mid));
}
else if(e.getSource()==b2) {
String reverse = "";
for(int i = length-1; i>=0; i--) {
reverse = reverse + s.charAt(i);
}
if (s.equals(reverse))
tf2.setText("Entered string is a palindrome.");
else
tf2.setText("Entered string is not a palindrome.");
}
else if(e.getSource()==b3) {
int count = 0;
char ch;
for(int i = 0; i<s.length(); i++)
{
ch = s.charAt(i);
if (ch == 'a' || ch == 'A' || ch == 'e' || ch == 'E' || ch == 'i' ||
ch == 'I' || ch == 'o' || ch == 'O' || ch == 'u' || ch == 'U')
count ++;
}
tf2.setText("The number of vowels: "+count);
}
else if(e.getSource()==b4) {
int i=0;
while (true)
{

```

```
try
{
s.charAt(i);
i++;
}
catch(StringIndexOutOfBoundsException ex)
{
tf2.setText("The length of string is "+i);
break;
}
}
}
}
public static void main(String[] args) {
new StringOperations();
}
}
```