VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT on

OBJECT ORIENTED JAVA PROGRAMMING (21CS3PCOOJ)

Submitted by

STUTI UNIYAL (1BM21CS220)

in partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

B.M.S. COLLEGE OF ENGINEERING BENGALURU-560019

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(Autonomous Institution under VTU)

B. M. S. College of Engineering,

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(Affiliated To Visvesvaraya Technological University, Belgaum)

Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "Object Oriented Java Programming (21CS3PCOOJ)" carried out by **STUTI UNIYAL (1BM21CS220)** who is bonafide student of **B. M. S. College of Engineering**. It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2022. The Lab report has been approved as it satisfies the academic requirements in respect of a Object Oriented Java Programming (21CS3PCOOJ) work prescribed for the said degree.

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1.Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or
Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

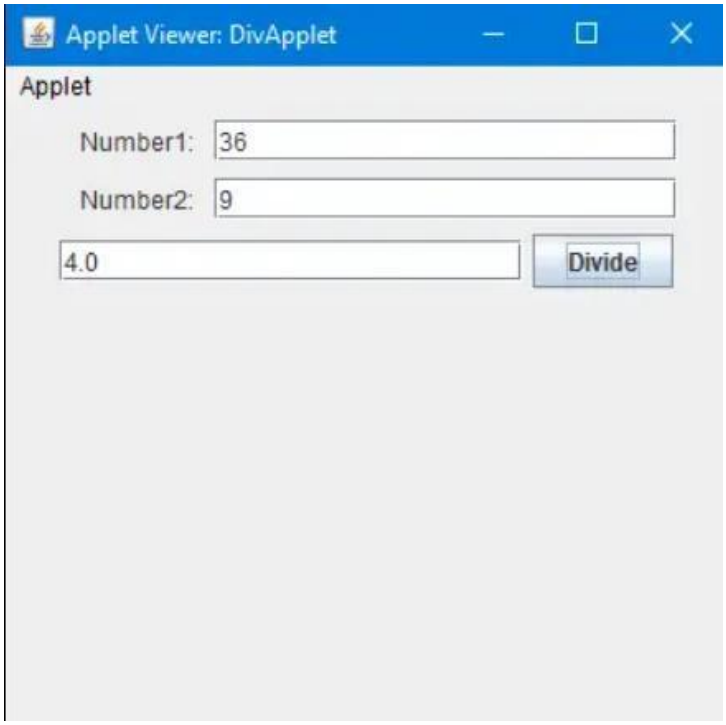
CODE;

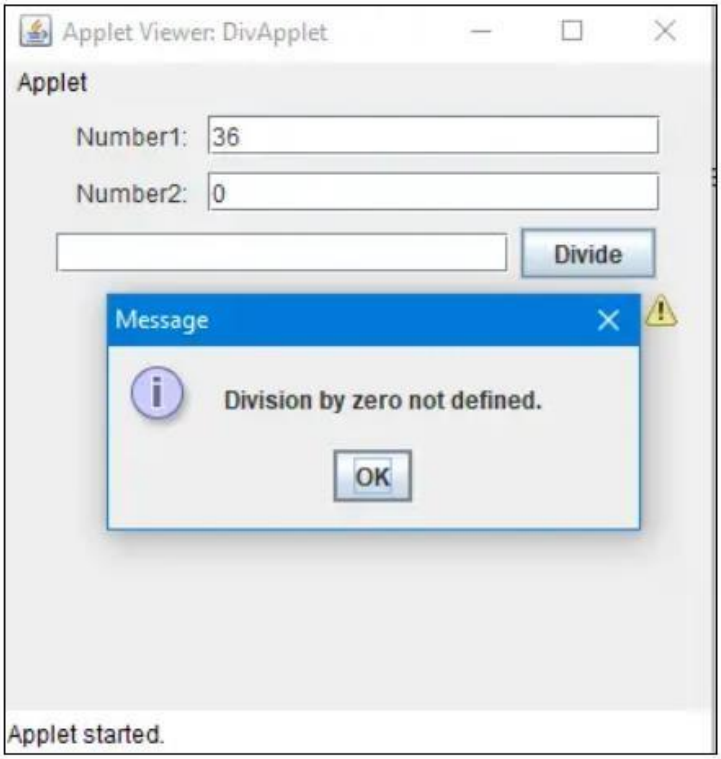
```
import java.awt.*; import java.awt.event.*; import
javax.swing.* public class DivApplet extends JApplet
implements ActionListener{
JTextField
number1,number2,result;
JButton divide; public void
init(){ try {
SwingUtilities.invokeAnd
Wait( new Runnable() {
public void run() {
makeGUI();
            }
         });
}
catch (Exception exc) {
System.out.println("Can't create because of " + exc);
      }
   }
 private void makeGUI(){
setLayout(new FlowLayout());
Label number1p = new Label("Number1:
",Label.RIGHT); Label number2p = new
Label("Number2: ",Label.RIGHT); number1= new
JTextField(20); number2 = new JTextField(20);
```

```
result = new
JTextField(20); divide =
new JButton("Divide");
add(number1p);
add(number1);
add(number2p);
add(number2); add(result);
add(divide);
divide.addActionListener(this);
}
  public void
actionPerformed(ActionEvent e){
String snumber1,snumber2;   snumber1 =
number1.getText();   snumber2 =
number2.getText();
  try{
  int number1 =
Integer.parseInt(snumber1);   int number2
= Integer.parseInt(snumber2);
if(number2==0)
  JOptionPane.showMessageDialog(null, "Division by zero not
defined.");
  else{
  double r = (double)number1/number2;
result.setText(((Double)r).toString());
}
        }
      catch(NumberFormatException ne)
  {
  JOptionPane.showMessageDialog(null,"Enter a number");
  }
```

```
    }
}
```

OUTPUT;


Applet Viewer: DivApplet
Applet
Number1: 36
Number2: 9
4.0
Divide


Applet Viewer: DivApplet
Applet
Number1: 36
Number2: 0
Divide
Message
Division by zero not defined.
OK
Applet started.

2.Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses.

```
//Student
package CIE;

public class Student1{
    public String usn;
    public String name;
    public int sem;
}
//Internals
package CIE;

public class Internals extends Student1{
    public int marks[] = new int[5];
}
//External
package SEE;
import CIE.Student1;

public class External extends Student1{
    public int marks[] = new int[5];
}
import java.util.Scanner;
import CIE.Internals;
import SEE.External;
```

```
public class lots_of_packages{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        int n, i, j;
        System.out.println("Enter the number of students:");
        n = sc.nextInt();
        Internals[] inter = new Internals[n];
        External[] exter = new External[n];
        for(i=0;i<n;i++){
            inter[i] = new Internals();
            exter[i] = new External();
            System.out.println("Enter the details of "+ (i+1)+"th Student");
            System.out.println("Enter their USN");
            inter[i].usn = sc.next();
            exter[i].usn = inter[i].usn;
            System.out.println("Enter name: ");
            inter[i].name = sc.next();
            exter[i].name = inter[i].name;
            System.out.println("Enter Semester: ");
            inter[i].sem = sc.nextInt();
            exter[i].sem = inter[i].sem;
            System.out.println("Enter the internal marks of 5 courses with 3 credits each: ");
            for(j=0;j<5;j++)
                inter[i].marks[j] = sc.nextInt();
            System.out.println("Enter the External marks of 5 subjects with 3 credits each: ");
            for(j=0;j<5;j++)
                exter[i].marks[j] = sc.nextInt();
        }
        System.out.println("Details of students with their final marks are: ");
```

```
        for(i=0;i<n;i++){
            System.out.println("Student "+ (i+1)+ ": ");
            System.out.println("USN: "+ inter[i].usn);
            System.out.println("Name: " + inter[i].name);
            System.out.println("Semester: "+ inter[i].sem);
            System.out.println("Final Marks: ");
            for(j=0;j<5;j++)
                System.out.println((j+1)+ "th subject: "+ ((inter[i].marks[j]+exter[i].marks[j])/2));
        }

    }
}
```

OUTPUT

```
Enter the number of students:
2
Enter the details of 1th Student
Enter their USN
101
Enter name:
Ramesh
Enter Semester:
3
Enter the internal marks of 5 courses with 3 credits each:
48
47
46
46
50
Enter the External marks of 5 subjects with 3 credits each:
92
91
90
94
96
```

```
Enter the details of 2th Student
Enter their USN
102
Enter name:
Suresh
Enter Semester:
3
Enter the internal marks of 5 courses with 3 credits each:
45
46
47
44
42
Enter the External marks of 5 subjects with 3 credits each:
94
97
92
91
90
```

```
Details of students with their final marks are:
Student 1:
USN: 101
Name: Ramesh
Semester: 3
Final Marks:
1th subject: 70
2th subject: 69
3th subject: 68
4th subject: 70
5th subject: 73
Student 2:
USN: 102
Name: Suresh
Semester: 3
Final Marks:
1th subject: 69
2th subject: 71
3th subject: 69
4th subject: 67
5th subject: 66
```

Demonstrate Inter process Communication and deadlock

```
public class DeadlockExample {
   static Object lock1 = new Object();
   static Object lock2 = new Object();

   static class Thread1 extends Thread {
      public void run() {
         synchronized (lock1) {
            System.out.println("Thread 1: Holding lock 1...");
            try {
               Thread.sleep(10);
            } catch (InterruptedException e) {
               e.printStackTrace();
            }
            System.out.println("Thread 1: Waiting for lock 2...");
            synchronized (lock2) {
               System.out.println("Thread 1: Holding lock 1 & 2...");
            }
         }
      }
   }

   static class Thread2 extends Thread {
      public void run() {
         synchronized (lock2) {
            System.out.println("Thread 2: Holding lock 2...");
            try {
               Thread.sleep(10);
            } catch (InterruptedException e) {
               e.printStackTrace();
            }
```

```
            System.out.println("Thread 2: Waiting for lock 1...");
            synchronized (lock1) {
                System.out.println("Thread 2: Holding lock 1 & 2...");
            }
        }
    }
}

public static void main(String[] args) {
    new Thread1().start();
    new Thread2().start();
}
}
```

OUTPUT