

Report 2 ooj lab programs :-

Lab6:-

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.

Program:-

```
package CIE;  
import java.util.*;  
  
public class student{  
  
    public String usn;  
    public String name;  
    public int sem;  
  
  
    public void personal()  
    {  
        Scanner in=new Scanner(System.in);  
        System.out.println("Enter usn:-");  
        usn=in.next();  
        System.out.println("Enter name:- ");  
        name=in.next();  
        System.out.println("Enter sem :-");  
        sem=in.nextInt();  
    }  
  
    public void display1(){  
        System.out.println("Name:-"+name+"\nUSN:-"+usn+"\nCurrent Semester:-"+sem);  
    }  
}
```

```
}

}

package CIE;

import java.util.*;

public class internals{

    public double C_Marks[];

    int i;

    public void internalmarks(){

        Scanner in=new Scanner(System.in);

        C_Marks=new double[5];

        System.out.println("Enter the CIE marks (out of 50):");

        for(i=0;i<5;i++)

        {

            System.out.println("Enter CIE marks for subject."+(i+1)+":-");

            C_Marks[i]=in.nextDouble();

        }

    }

}

import CIE.*;

import SEE.*;

import java.util.*;

class finalmark

{

    public static void main(String args[]){
```

```

int finalmarks;

Scanner in=new Scanner(System.in);

System.out.println("Enter the number of Students:-");

int n=in.nextInt();

student[] D= new student[n];

internals[] M1= new internals[n];

external[] M2=new external[n];

for(int j=0;j<n;j++)

{

D[j]=new student();

D[j].personal();

M1[j]=new internals();

M1[j].internalmarks();

M2[j]=new external();

M2[j].Externalmarks();

}

for(int j=0;j<n;j++)

{

D[j].display1();

System.out.println("Final marks of student "+(j+1)+":-");

for(int i=0;i<5;i++)

{

finalmarks=(int)(M1[j].C_Marks[i]+M2[j].S_Marks[i]/2);

System.out.println("SUBJECT-"+(i+1)+"is:-"+finalmarks);

}

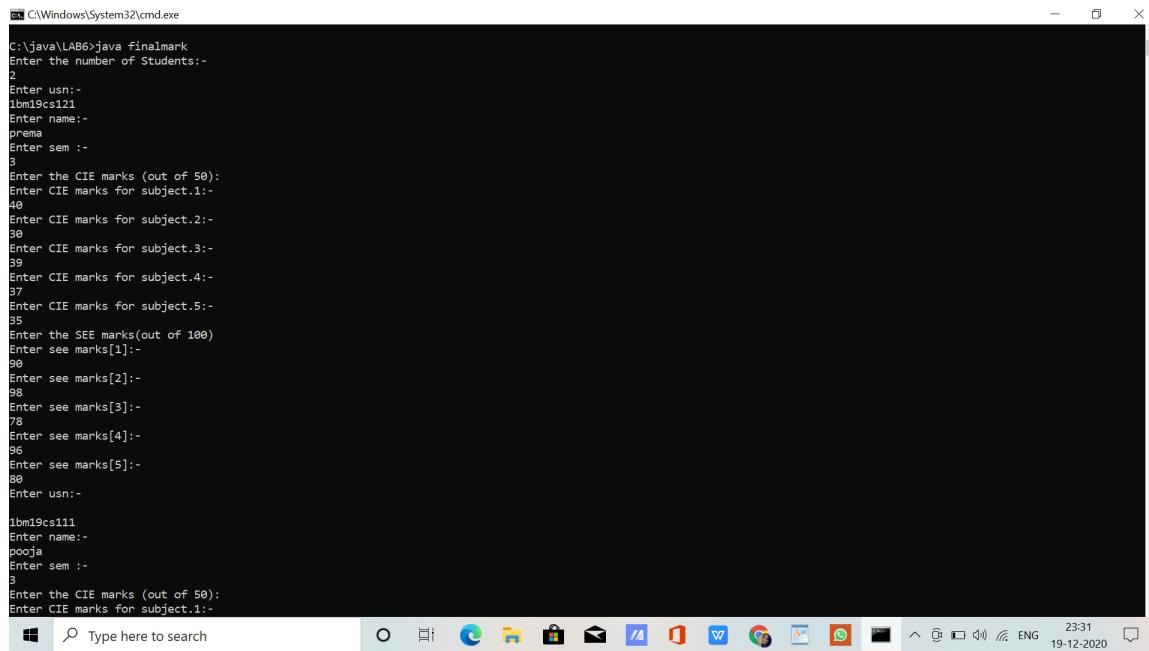
}

```

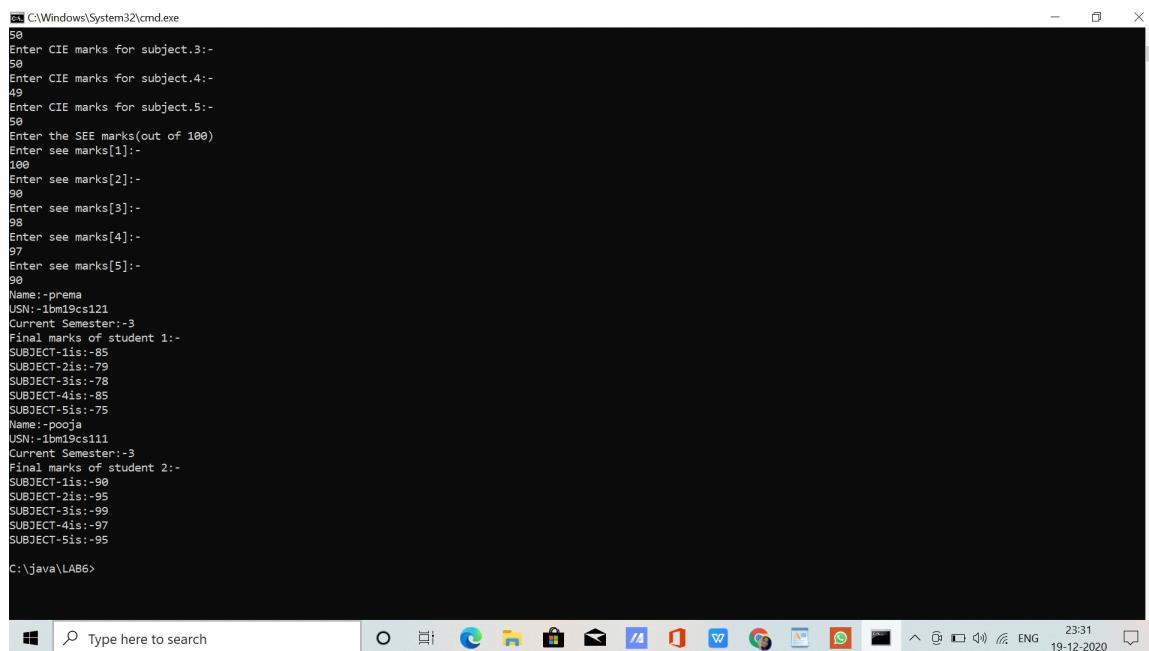
}

}

### output screenshots:-



```
C:\Windows\System32\cmd.exe
C:\java\LAB6>java finalmark
Enter the number of Students:-
2
Enter usn:-
ibm19cs121
Enter name:-
prema
Enter sem :-
3
Enter the CIE marks (out of 50):
Enter CIE marks for subject.1:-
48
Enter CIE marks for subject.2:-
38
Enter CIE marks for subject.3:-
39
Enter CIE marks for subject.4:-
37
Enter CIE marks for subject.5:-
35
Enter the SEE marks(out of 100)
Enter see marks[1]:-
98
Enter see marks[2]:-
98
Enter see marks[3]:-
78
Enter see marks[4]:-
96
Enter see marks[5]:-
88
Enter usn:-
ibm19cs111
Enter name:-
pooya
Enter sem :-
3
Enter the CIE marks (out of 50):
Enter CIE marks for subject.1:-
50
Enter CIE marks for subject.3:-
50
Enter CIE marks for subject.4:-
49
Enter CIE marks for subject.5:-
50
Enter the SEE marks(out of 100)
Enter see marks[1]:-
100
Enter see marks[2]:-
98
Enter see marks[3]:-
98
Enter see marks[4]:-
97
Enter see marks[5]:-
98
Name:-prema
USN:-ibm19cs121
Current Semester:-3
Final marks of student 1:-
SUBJECT-1is:-85
SUBJECT-2is:-79
SUBJECT-3is:-78
SUBJECT-4is:-85
SUBJECT-5is:-75
Name:-pooya
USN:-ibm19cs111
Current Semester:-3
Final marks of student 2:-
SUBJECT-1is:-90
SUBJECT-2is:-95
SUBJECT-3is:-99
SUBJECT-4is:-97
SUBJECT-5is:-95
C:\java\LAB6>
```



```
C:\Windows\System32\cmd.exe
50
Enter CIE marks for subject.3:-
50
Enter CIE marks for subject.4:-
49
Enter CIE marks for subject.5:-
50
Enter the SEE marks(out of 100)
Enter see marks[1]:-
100
Enter see marks[2]:-
98
Enter see marks[3]:-
98
Enter see marks[4]:-
97
Enter see marks[5]:-
98
Name:-prema
USN:-ibm19cs121
Current Semester:-3
Final marks of student 1:-
SUBJECT-1is:-85
SUBJECT-2is:-79
SUBJECT-3is:-78
SUBJECT-4is:-85
SUBJECT-5is:-75
Name:-pooya
USN:-ibm19cs111
Current Semester:-3
Final marks of student 2:-
SUBJECT-1is:-90
SUBJECT-2is:-95
SUBJECT-3is:-99
SUBJECT-4is:-97
SUBJECT-5is:-95
C:\java\LAB6>
```

WRITTEN:

1dbG

Date \_\_\_\_\_  
Page \_\_\_\_\_

```
package cie;  
import java.util.*;  
public class student {  
    public String name;  
    public String name;  
    public int sum;  
  
    public void personal()  
    {  
        Scanner in = new Scanner(System.in);  
        System.out.println("Enter name:-");  
        name = in.nextLine();  
        System.out.println("Enter sum:-");  
        sum = in.nextInt();  
    }  
  
    public void display()  
    {  
        System.out.println("Name:- " + name + "\n" +  
                           "sum:- " + sum);  
    }  
  
    package cie;  
    import java.util.*;  
    public class Internals {  
        public double cMarks[7];  
        int i;  
  
        public void internalMarks()  
        {  
            Scanner in = new Scanner(System.in);  
            cMarks = new double[5];  
            System.out.println("Enter the CIE marks ");  
        }  
    }
```

Date \_\_\_\_\_  
Page \_\_\_\_\_

```
for(i=0; i < c; i++)  
{  
    System.out.println("Subject " + (i+1) + ".:- ");  
    marks[i] = input.nextInt();  
}  
  
import java.*;  
import Scanner.*;  
import java.util.*;  
class finalmarks  
{  
    public static void main (String args[]){  
        int finalmarks;  
        Scanner in = new Scanner (System.in);  
        System.out.println ("Enter the number of students");  
        int n = in.nextInt();  
        student [] D = new student [n];  
        internal [] M1 = new internal [n];  
        external [] M2 = new external [n];  
        for (int i=0; i < n; i++)  
        {  
            D[i] = new student ();  
            D[i].personal ();  
            M1[i] = new internal ();  
            M1[i] = internalmarks ();  
            M2[i] = new external ();  
            M2[i].externalmarks ();  
        }  
    }  
}
```

for (int j=0; j<n; j++)

    if (j == 0)

        System.out.println ("Final marks of student  
                               +(j+1)+": -");

    for (int i=0; i<5; i++)

        if

            final marks = (int) (M1[j].C\_Marks[i] + M2[i])

            System.out.println ("SUBJECT:- " +(i+1) + " is "+

            if

            if

Lab7:-

Write a program to demonstrate generics with multiple object parameters.

Program:-

```
class TwoGen<T, V> {  
    T ob1;  
    V ob2;  
    TwoGen(T o1, V o2) {  
        ob1 = o1;  
        ob2 = o2;  
    }  
    void showTypes() {  
        System.out.println("Type of T is " +  
            ob1.getClass().getName());  
        System.out.println("Type of V is " +  
            ob2.getClass().getName());  
    }  
    T getob1() {  
        return ob1;  
    }  
    V getob2() {  
        return ob2;  
    }  
}  
class Gen {  
    public static void main(String args[]) {
```

```

TwoGen<Integer, String> tgObj =  

new TwoGen<Integer, String>(88, "Generics");  

// Show the types.  

tgObj.showTypes();  

// Obtain and show values.  

int v = tgObj.getob1();  

System.out.println("value: " + v);  

String str = tgObj.getob2();  

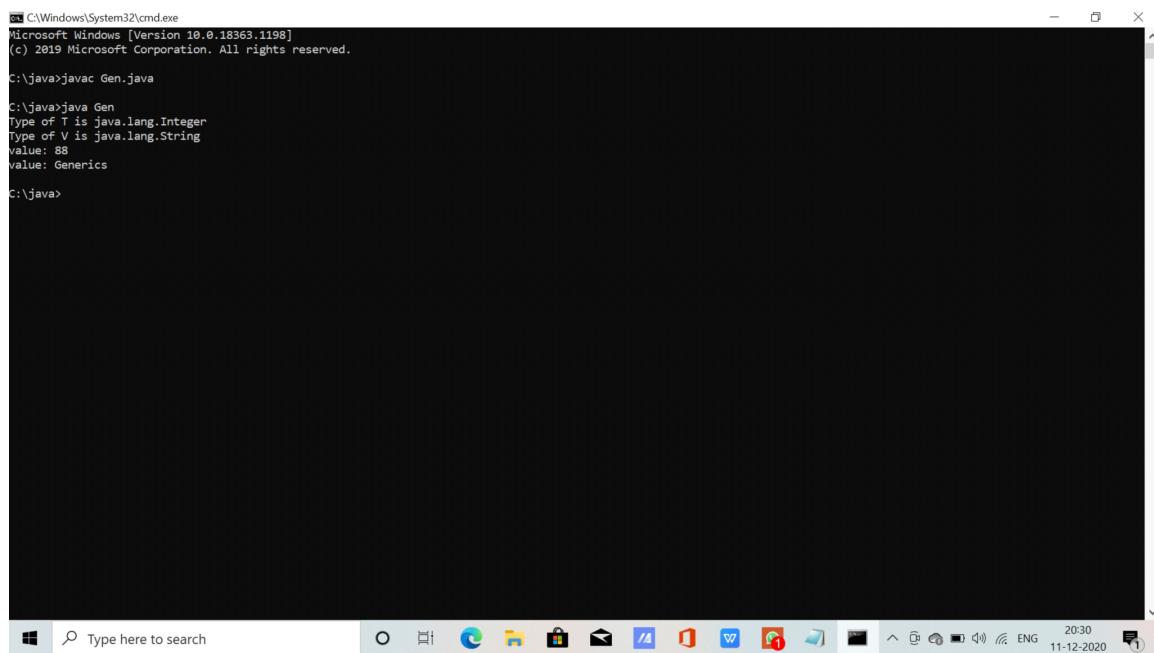
System.out.println("value: " + str);  

}  

}

```

Output screenshot:-



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.18363.1198]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\java>javac Gen.java
C:\java>java Gen
Type of T is java.lang.Integer
Type of V is java.lang.String
value: 88
value: Generics
C:\java>

```

written picture:

Lab 7.

```
class TWOGen<T, V> {
    T ob1;
    V ob2;
    TWOGen(T o1, V o2) {
        ob1 = o1;
        ob2 = o2;
    }
    void showTypes() {
        System.out.println("Type of T is " + ob1.getClass()
            .getName());
        System.out.println("Type of V is " + ob2.getClass()
            .getName());
    }
    T getOb1() {
        return ob1;
    }
}
class Gen {
    public static void main(String args[]) {
        TWOGen<Integer, String> tgObj = new TWOGen<
            Integer, String>(88, "Genomics");
        tgObj.showTypes();
        int v = tgObj.getOb1();
        System.out.println("value : " + v);
        String str = tgObj.getOb2();
        System.out.println("value : " + str);
    }
}
```

LAB-8

Write a program that demonstrates handling of exceptions in inheritance tree. Create a base class called “Father” and derived class called “Son” which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge( ) when the input age<0. In Son class, implement a constructor that cases both father and son’s age and throws an exception if son’s age is >=father’s age.

PROGRAM:-

```
import java.util.Scanner;

class WrongAge extends Exception{

    int age;

    WrongAge(int x)

    {

        age=x;

    }

    public String toString()

    {

        return "AGE OF SON="+age+" IS ENTERED INCORRECTLY";

    }

}

class father

{

    int a;

    father(int x)

    {

        a=x;

    }

}

class son extends father{
```

```
int age;

son(int fage,int sage){

    super(fage);

    age=sage;

}

void compute() throws WrongAge{

    if(age>=a)

    {

        throw new WrongAge(age);

    }

    else{

        System.out.println("THE AGES ARE ENTERED CORECTLY");

        System.out.println("FATHER'S AGE="+a+"\t"+SON'S AGE="+age);

    }

}

}

class exmain

{

    public static void main(String args[])

    {

        Scanner s=new Scanner(System.in);

        System.out.println("ENTER FATHER'S AGE");
```

```

int f=s.nextInt();

System.out.println("ENTER SON'S AGE");

int so=s.nextInt();

son ss=new son(f,so);

try{

    ss.compute();

}catch(WrongAge e)

{



    System.out.println(e);

}

}

}


```

**output screenshot:-**

```

C:\Windows\System32\cmd.exe
C:\java>javac exmain.java
C:\java>java exmain
ENTER FATHER'S AGE
23
ENTER SON'S AGE
4
THE AGES ARE ENTERED CORRECTLY
FATHER'S AGE=23 SON'S AGE=4

C:\java>java exmain
ENTER FATHER'S AGE
4
ENTER SON'S AGE
23
AGE OF SON=23 IS ENTERED INCORRECTLY
C:\java>

```

**written pictures:**

Lab 8.

```
import java.util.Scanner;
class WrongAge extends Exception {
    int age;
    WrongAge(int x) {
        age = x;
    }
    public String toString() {
        return "Age of son = "+age+" is entered incorrectly";
    }
}
class Father {
    int a;
    Father(int x) {
        a = x;
    }
}
class Son extends Father {
    int age;
    Son(int fage, int sage) {
        super(fage);
        age = sage;
    }
    void compute() throws WrongAge {
        if (age >= a)
            throw new WrongAge(age);
        else
    }
}
```

```

System.out.println ("the ages are entered
correctly");
System.out.println ("father's age = " + a + " \t " + "
son's age = " + age);
}

}

class ermain
{
public static void main (String args[])
{
Scanner s = new Scanner (System.in);
System.out.println ("enter father's age");
int f = s.nextInt();
System.out.println ("Enter son's age");
int so = s.nextInt();
son ss = new son (f, so);
try {
ss.compute();
} catch (Wrongage e)
{
System.out.println (e);
}
}
}

```

Lab -9:-

Write a program which creates two threads, one thread displaying “BMS College of Engineering” once every ten seconds and another displaying “CSE” once every two seconds.

program:--

```
class BMSCE implements Runnable {  
    BMSCE() {  
        new Thread(this, "BMSCE College of Engineering").start();  
    }  
  
    public void run() {  
        try {  
            while(true) {  
                System.out.println("BMSCE College of Engineering");  
                Thread.sleep(10000); // 10 seconds  
            }  
        } catch (InterruptedException e) {  
            System.out.println("BMSCE thread interrupted.");  
        }  
    }  
  
    class CSE implements Runnable {  
        CSE() {  
            new Thread(this, "CSE").start();  
        }  
  
        public void run() {  
            try {  
                while(true) {
```

```
System.out.println("CSE");

Thread.sleep(2000); // 2seconds

}

} catch (InterruptedException e) {

System.out.println("CSE thread interrupted.");

}

}

}

class Display {

public static void main(String args[]) {

new BMSCE();

new CSE();

System.out.println("Press Control-C to stop.");

}

}

output screenshot:-
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.18363.1198]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\java>java Display
BMSCE College of Engineering
Press Control-C to stop.
CSE
CSE
CSE
CSE
CSE
CSE
BMSCE College of Engineering
CSE
CSE
CSE
CSE
CSE
CSE
BMSCE College of Engineering
CSE
CSE
CSE
CSE
CSE
CSE
BMSCE College of Engineering
CSE
CSE
C:\java>
```

written picture:

Lab-9.

```
class BMSCE implements Runnable {  
    BMSCE() {  
        new Thread(this, "BMSCE College of Engineering").start();  
    }  
    public void run() {  
        try {  
            while(true) {  
                System.out.println("BMSCE College of Engineering");  
                Thread.sleep(1000);  
            }  
        } catch (InterruptedException e) {  
            System.out.println("BMSCE thread interrupted.");  
        }  
    }  
}  
  
class CSE implements Runnable {  
    CSE() {  
        new Thread(this, "CSE").start();  
    }  
    public void run() {  
        try {  
            while(true) {  
                System.out.println("CSE");  
                Thread.sleep(2000);  
            }  
        } catch (InterruptedException e) {  
            System.out.println("CSE thread interrupted.");  
        }  
    }  
}
```

## LAB-10

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.

### PROGRAM:

```
import java.awt.*;
```

```
import java.awt.event.*;
```

```
public class lab10 extends Frame implements ActionListener {
```

```
    TextField num1, num2;
```

```
    Label l;
```

```
    Button n;
```

```
    lab10() {
```

```
        num1 = new TextField();
```

```
        num1.setBounds(50, 50, 200, 25);
```

```
        num2 = new TextField();
```

```
        num2.setBounds(50, 100, 200, 25);
```

```
        l = new Label();
```

```
        l.setBounds(50, 150, 300, 50);
```

```
        n = new Button("Divide");
```

```
n.setBounds(50, 200, 100, 50);

n.addActionListener(this);

add(n);

add(num1);

add(num2);

add(l);

setSize(800, 800);

setLayout(null);

setVisible(true);

}

public void actionPerformed(ActionEvent e) {

try {

String n1 = num1.getText();

String n2 = num2.getText();

l.setText("Quotient: " + (Integer.parseInt(n1) / Integer.parseInt(n2)));

} catch (NumberFormatException ze) {

l.setText("NumberFormatException,Cannot divide non-integer values");

} catch (ArithematicException ze) {

l.setText("ArithematicException Cannot divide");

} catch (Exception ex) {

System.out.println(ex);

}

}
```

}

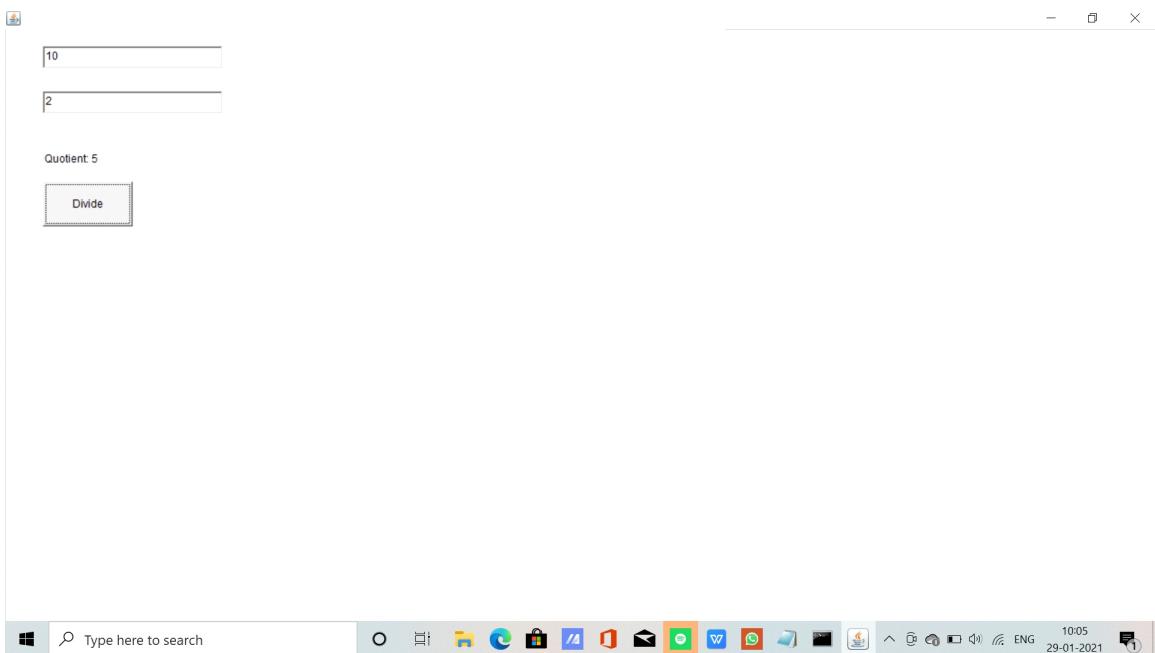
```
public static void main(String[] args) {
```

```
    new lab10();
```

}

}

**OUTPUT:**



12

0.5

NumberFormatException, Cannot divide non-integer value

Divide

Type here to search

10

0

ArithmaticException, Cannot divide

Divide

Type here to search

WRITTEN:

```
import java.awt.*;
import java.awt.event.*;
```

```
public class lab10 extends Frame implements  
ActionListener
```

```
TextField num1, num2;
```

```
Label l;
```

```
Button n;
```

```
lab10() {
```

```
num1 = new TextField();
```

```
num1.setBounds(50, 50, 200, 25);
```

```
num2 = new TextField();
```

```
num2.setBounds(50, 100, 200, 25);
```

```
l = new Label();
```

```
l.setBounds(50, 150, 300, 50);
```

```
n = new Button("Divide");
```

```
n.setBounds(50, 200, 100, 50);
```

```
n.addActionListener(this);
```

```
add(n);
```

```
add(num1);
```

```
add(num2);
```

```
add(l);
```

```
setSize(500, 300);
```

```
setLayout(null);
```

```
setVisible(true);
```

```
}
```

```
public void actionPerformed(ActionEvent e) {
    try {
        String n1 = num1.getText();
        String n2 = num2.getText();
        l.setText("Quotient: " + (Integer.parseInt(n1) /
            Integer.parseInt(n2)));
    } catch (NumberFormatException ex) {
        l.setText("NumberFormatException, cannot divide
        non-integer values");
    } catch (ArithmaticException ex) {
        l.setText("Arithmatic Exception, cannot divide");
    } catch (Exception ex) {
        System.out.println(ex);
    }
}

public static void main (String [] args) {
    new lab10();
}
```

