

Lab record.

Pooja K.
1BM19CS111

Program 6

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.

//Package Program

```

* package CIE;
import java.util.Scanner;
public class Internals
{
    public double CieMarks[];
    public double CieSum = 0.0;
    int i;

    public void Iaccept()
    {
        Scanner I = new Scanner(System.in);
        CieMarks = new double[5];
        System.out.println("Enter the cie marks of
        5 courses out of 50");
        for(i=0; i<5; i++)
        {
            System.out.println("Enter cie marks[" + (i+1) + "]");
            CieMarks[i] = I.nextDouble();
        }
    }
}

```

```

* package CIE;
import java.util.Scanner;
public class Student
{
}

```

```
public String usn;
public String name;
public int sem;
```

```
public void accept() {
    Scanner A = new Scanner(System.in);
    System.out.println("Enter usn");
    usn = A.next();
    System.out.println("Enter name");
    name = A.next();
    System.out.println("Enter sem");
    sem = A.nextInt();
}
```

```
public void display()
```

```
System.out.println("USN:" + usn + "NAME"
    + name + "\nSEM:" + sem);
```

3

*

```
package SEE;
import java.util.Scanner;
import CIE.*;
```

```
public class External extends CIE.Student
```

```
{}
public double SeeMarks[];
public int credits[];
int i;
```

```
public void Facept()
{
    Scanner F = new Scanner (System.in);
    SeeMarks = new double [5];
    credits = new int [5];
    System.out.println("Enter SEE marks of 5
courses out of 100");
    for (i=0; i<5; i++)
    {
        System.out.println("Enter see marks
[" + (i+1) + "]");
        SeeMarks[i] = F.nextDouble();
    }
}
```

*

```
import CIE.*;
import SEE.*;
import java.util.Scanner;
```

```
class FinalMarks {
    public static void main (String [] args)
    {
        int FS;
```

```
        Scanner F = new Scanner (System.in);
        System.out.println ("Enter number of students");
        int n = F.nextInt();
```

CIE. Student[] cs = new CIE. Student[n];
 CIE. Internals[] ci = new CIE. Internals[n];
 SEE. Externals[] se = new SEE. Externals[n];

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

{
 cs[j] = new CIE. Student();

cs[j].accept();

ci[j] = new CIE. Internals();

ci[j].IAccept();

se[j] = new SEE. Externals();

se[j].accept();

}

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

{
 cs[j].display();

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

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

{
 FS = (int) ((ci[j].CIEmarks[i] + se[j].SEE
 Marks[i]) / 2);

System.out.println ("In course: " + (i+1) +
 " FS : " + (FS));

}

4

3

3

Internals.java - Notepad

File Edit Format View Help

```
package CIE;

import java.util.Scanner;
public class Internals
{
    public double CieMarks[];
    public double Ciesum=0.0;
    int i;

    public void Iaccept()
    {
        Scanner I=new Scanner(System.in);
        CieMarks=new double[5];
        System.out.println("Enter the cie marks of 5 courses out of 50");
        for(i=0;i<5;i++)
        {
            System.out.println("Enter cie marks["++(i+1)+"]");
            CieMarks[i]=I.nextDouble();
        }
    }
}
```

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Windows (CRLF)

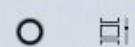
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Student.java - Notepad

File Edit Format View Help

```
package CIE;
import java.util.Scanner;
public class Student
{
    public String usn;
    public String name;
    public int sem;

    public void accept()
    {
        Scanner A=new Scanner(System.in);

        System.out.println("Enter usn ");
        usn=A.next();
        System.out.println("Enter name ");
        name=A.next();
        System.out.println("Enter sem ");
        sem=A.nextInt();
    }
    public void display()
    {
        System.out.println(" USN: "+usn);
        System.out.println(" NAME: "+name);
        System.out.println(" SEM: "+sem);
    }
}
```

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Windows (CRLF)

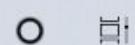
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Externals.java - Notepad

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```
package SEE;
import java.util.Scanner;
import CIE.*;

public class Externals extends CIE.Student
{
    public double SeeMarks[];
    public int credits[];
    int i;

    public void Eaccept()
    {
        Scanner E=new Scanner(System.in);
        SeeMarks=new double[5];
        credits=new int[5];
        System.out.println("Enter the see marks of 5 courses out of 100");
        for(i=0;i<5;i++)
        {
            System.out.println("Enter see marks["+ (i+1) + "]");
            SeeMarks[i]=E.nextDouble();
        }
    }
}
```

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FinalMarks.java - Notepad

File Edit Format View Help

```
import CIE.*;
import SEE.*;
import java.util.Scanner;

class FinalMarks
{
    public static void main(String sss[])
    {
int FS;

Scanner F=new Scanner(System.in);
System.out.println("Enter the number of Students");
int n=F.nextInt();

CIE.Student[] cs= new CIE.Student[n];
CIE.Internals[] ci= new CIE.Internals[n];
SEE.Externals[] se=new SEE.Externals[n];
for(int j=0;j<n;j++)
{
cs[j]=new CIE.Student();
cs[j].accept();
ci[j]=new CIE.Internals();
ci[j].Iaccept();
se[j]=new SEE.Externals();
se[j].Eaccept();

}
for(int j=0;j<n;j++)
{
cs[j].display();
System.out.println("Final marks of student "+(j+1));
for(int i=0;i<5;i++)
{
FS=(int)(ci[j].CieMarks[i]+se[j].SeeMarks[i]/2);
}
}
}
}
```

Ln 1, Col 1

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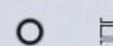
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FinalMarks.java - Notepad

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```
public static void main(String sss[])
{
int FS;

Scanner F=new Scanner(System.in);
System.out.println("Enter the number of Students");
int n=F.nextInt();

CIE.Student[] cs= new CIE.Student[n];
CIE.Internals[] ci= new CIE.Internals[n];
SEE.Externals[] se=new SEE.Externals[n];
for(int j=0;j<n;j++)
{
cs[j]=new CIE.Student();
cs[j].accept();
ci[j]=new CIE.Internals();
ci[j].Iaccept();
se[j]=new SEE.Externals();
se[j].Eaccept();

}
for(int j=0;j<n;j++)
{
cs[j].display();
System.out.println("Final marks of student "+(j+1));
for(int i=0;i<5;i++)
{
FS=(int)(ci[j].CieMarks[i]+se[j].SeeMarks[i]/2);
System.out.println("In course:" +(i+1)+"is :" +(FS));
}
}
}
```

Ln 1, Col 1

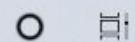
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22-11-2020 ENG
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C:\Windows\System32\cmd.exe

```
C:\Users\Pooja K\Downloads>java FinalMarks
```

```
Enter the number of Students
```

```
2
```

```
Enter usn
```

```
111
```

```
Enter name
```

```
pooja
```

```
Enter sem
```

```
3
```

```
Enter the cie marks of 5 courses out of 50
```

```
Enter cie marks[1]
```

```
45
```

```
Enter cie marks[2]
```

```
44
```

```
Enter cie marks[3]
```

```
44
```

```
Enter cie marks[4]
```

```
44
```

```
Enter cie marks[5]
```

```
44
```

```
Enter the see marks of 5 courses out of 100
```

```
Enter see marks[1]
```

```
89
```

```
Enter see marks[2]
```

```
99
```

```
Enter see marks[3]
```

```
89
```

```
Enter see marks[4]
```

```
88
```

```
Enter see marks[5]
```

```
99
```

```
Enter usn
```

```
108
```

```
Enter name
```

```
arfa
```

```
Enter sem
```

```
3
```

```
Enter the cie marks of 5 courses out of 50
```

```
Enter cie marks[1]
```

```
44
```

C:\Windows\System32\cmd.exe

Enter the cie marks of 5 courses out of 50

Enter cie marks[1]

44

Enter cie marks[2]

34

Enter cie marks[3]

43

Enter cie marks[4]

42

Enter cie marks[5]

44

Enter the see marks of 5 courses out of 100

Enter see marks[1]

88

Enter see marks[2]

99

Enter see marks[3]

89

Enter see marks[4]

87

Enter see marks[5]

77

USN: 111

NAME: pooja

SEM: 3

Final marks of student 1

In course:1is :89

In course:2is :93

In course:3is :88

In course:4is :88

In course:5is :93

USN: 108

NAME: arfa

SEM: 3

Final marks of student 2

In course:1is :88

In course:2is :83

In course:3is :87

In course:4is :85

In course:5is :82



Lab program 7

Write a program to demonstrate generics with multiple object parameters.

28/11/20

POOJA.K

LAB program.

IBMI9CS 111

//Generics program

```
class TwoGenerics < T, V >
{
    T ob1;
    V ob2;
```

```
TwoGenerics( T ob1, V ob2 )
{
```

```
    this. ob1 = ob1;
```

```
    this. ob2 = ob2;
```

```
}
```

```
    T getOb1()
{
```

```
    return ob1;
```

```
}
```

```
    V getOb2()
{
```

```
    return ob2;
}
```

```
void showTypes()
```

```
{
```

```
    System.out.println("Type of T is: " +
        ob1.getClass().getName());
```

```
    System.out.println("Type of V is: " +
        ob2.getClass().getName());
```

```
}
```

- }

```
class Gene
{
    public static void main (String args[])
    {
        TwoGenerics<Integer, String> obj = new
        TwoGenerics<Integer, String>(45, "Pooja");
        obj.showTypes();
        int integerValue = obj.getObj1();
        System.out.println ("The given Integer is: "
                           + integerValue);
        String str = obj.getObj2();
        System.out.println ("The given String is: "
                           + str);
    }
}
```

*Gene.java - Notepad

```
File Edit Format View Help
class TwoGenerics<T, V>
{
    T ob1;
    V ob2;
    TwoGenerics(T ob1, V ob2)
    {
        this.ob1 =ob1;
        this.ob2 =ob2;
    }
    T getOb1()
    {
        return ob1;
    }
    V getOb2()
    {
        return ob2;
    }
    void showTypes()
    {
        System.out.println("Type of T is : " + ob1.getClass().getName());
        System.out.println("Type of V is : " + ob2.getClass().getName());
    }
}
class Gene
{
    public static void main(String args[])
    {
        TwoGenerics<Integer, String> obj = new TwoGenerics<Integer, String>(45, "Pooja");
        obj.showTypes();
        int integerValue = obj.getOb1();
        System.out.println("The given Integer is : " + integerValue);
        String str = obj.getOb2();
        System.out.println("The given String is : " + str);
    }
}
```

Ln 27, Col 4 100% Windows (CRLF) UTF-8

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12:35 27-11-2020

C:\Windows\System32\cmd.exe

C:\Users\Pooja K\Downloads>javac Gene.java

C:\Users\Pooja K\Downloads>java Gene
Type of T is : java.lang.Integer
Type of V is : java.lang.String
The given Integer is : 45
The given String is : Pooja

C:\Users\Pooja K\Downloads>

Type here to search



12:33
27-11-2020

Lab program 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 \geq father ’ s age.

// Exception handling

class WrongAge extends Exception
{

 public String toString()
 {

 return "Please enter the right age:";
 }

}

class Father

{

 int age;

 Father (int age1)

{

 age = age1;

 System.out.println("Father age :" + age);

{

}

class Son extends Father

{

 Son (int age1)

{

 super (age1);

 System.out.println("Son age :" + age);

{

}

```
class Excep  
{
```

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

```
        int i = args.length;
```

```
        int j = Integer.parseInt(args[0]);
```

```
        int k = Integer.parseInt(args[1]);
```

```
        if (i <= 0 || j <= k)
```

```
{
```

```
    throw new WrongAge();
```

```
}
```

```
else
```

```
{
```

```
    Father f = new Father(j);
```

```
    Son s = new Son(k);
```

```
}
```

```
}
```

```
}
```

Excep.java - Notepad

File Edit Format View Help

```
class WrongAge extends Exception
{
    public String toString()
    {
        return "Please enter the right age:";
    }
}
class Father
{
    int age;
    Father(int age1)
    {
        age=age1;
        System.out.println("Father age:"+age);
    }
}
class Son extends Father
{
    Son(int age1)
    {
        super(age1);
        System.out.println("Son age:"+age);
    }
}
class Excep
{
    public static void main(String args[]) throws WrongAge
    {
        int i=args.length;
        int j=Integer.parseInt(args[0]);
        int k=Integer.parseInt(args[1]);
        if(i<=0 || j<=k)
        {
            throw new WrongAge();
        }
    }
}
```

Ln 39, Col 23

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Windows (CRLF)

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27-11-2020



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Excep.java - Notepad

File Edit Format View Help

```
{  
    int age;  
    Father(int age1)  
    {  
        age=age1;  
        System.out.println("Father age:"+age);  
    }  
}  
class Son extends Father  
{  
    Son(int age1)  
    {  
        super(age1);  
        System.out.println("Son age:"+age);  
    }  
}  
class Excep  
{  
    public static void main(String args[]) throws WrongAge  
    {  
        int i=args.length;  
        int j=Integer.parseInt(args[0]);  
        int k=Integer.parseInt(args[1]);  
        if(i<=0 || j<=k)  
        {  
            throw new WrongAge();  
        }  
        else  
        {  
            Father f=new Father(j);  
            Son s=new Son(k);  
        }  
    }  
}
```

Ln 39, Col 23

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27-11-2020



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C:\Windows\System32\cmd.exe
C:\Users\Pooja K\Downloads>javac Excep.java

C:\Users\Pooja K\Downloads>java Excep 0
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 1
at Excep.main(Excep.java:31)

C:\Users\Pooja K\Downloads>java Excep 0 0
Exception in thread "main" Please enter the right age:
at Excep.main(Excep.java:34)

C:\Users\Pooja K\Downloads>java Excep 15 35
Exception in thread "main" Please enter the right age:
at Excep.main(Excep.java:34)

C:\Users\Pooja K\Downloads>java Excep 35 15
Father age:35

Son age:15

C:\Users\Pooja K\Downloads>

Lab program 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.

11/12/20

POOJA.K

LAB Program.

IBM19CS111

// Thread program

```
class BMSCE implements Runnable {
```

```
    BMSCE() {
```

```
        new Thread(this, "BMSCE college of engineering").  
            start();
```

```
}
```

```
public void run() {
```

```
    try {
```

```
        while (true) {
```

```
            System.out.println("BMS 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); // 2 seconds  
}  
  
}  
  
catch (InterruptedException e) {  
    System.out.println("CSE thread interrupted.");  
}  
}
```

```
class Display {  
    public static void main (String args[]) {  
        new BMSFC();  
        new CSE();  
        System.out.println ("Press Control-c to stop");  
    }  
}
```

Display.java - Notepad

File Edit Format View Help

```
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.");  
}  
}  
}
```

Ln 17, Col 4

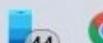
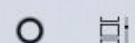
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Display.java - Notepad

File Edit Format View Help

```
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.");
}
}
```

Ln 17, Col 4

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Windows (CRLF)

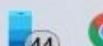
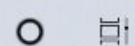
UTF-8

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11-12-2020



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

C:\Users\Pooja K\Documents>javac Display.java

C:\Users\Pooja K\Documents>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
CSE
CSE
CSE
CSE
BMSCE College of Engineering
CSE
CSE
CSE
CSE
CSE
CSE
C:\Users\Pooja K\Documents>
```



Lab program 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 ArithmeticException. Display the exception in a message dialog box.

Lab Program 10

IBM19CS111

//Division using interface program.

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

```
public class Divisions extends Frame implements
ActionListener
```

```
{
```

```
Dialog d;
```

```
TextField Num1, Num2, result;
```

```
Button Divide;
```

```
public Divisions()
{
```

```
setLayout(new FlowLayout());
```

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

```
Num1 = new TextField(10);
```

```
Num2 = new TextField(10);
```

```
result = new TextField(10);
```

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

```
add(new Label("Enter 1st number : "));
```

```
add(Num1);
```

```
add(new Label("Enter 2nd number : "));
```

```
add(Num2);
```

```
add(new Label("Result : "));
```

```
add(result);
```

```
add(Divide);
```

```

    Divide.addActionListener(this);
    setVisible(true);
    addWindowListener(new MyWindowAdapter());
}

```

```

public void actionPerformed(ActionEvent ae)
{

```

```

    if (ae.getSource() == Divide)
}

```

```

    try
{

```

```

        result.setText(Integer.toString((Integer.parseInt(
            num1.getText().trim()) / Integer.parseInt(
            num2.getText().trim()))));
}

```

```

    catch (ArithmaticException aex)
}

```

```

    Dia d1 = new Dia("Arithmatic Exception");

```

```

    d1.setVisible(true);
}

```

```

catch (NumberFormatException nfe)
}

```

```

    Dia d2 = new Dia("Number Format Exception");

```

```

    d2.setVisible(true);
}
}

```

```

public static void main(String args[])
{

```

```

    new Divisions();
}
}

```

```
class Dia extends Dialog implements  
ActionListener  
{  
    Button ok;  
  
    Dia(String str)  
    {  
        super(new Frame(), str, true);  
        ok = new Button ("OK");  
        setLayout(new FlowLayout());  
        setSize(300, 200);  
        add(ok);  
        ok.addActionListener(this);  
        addWindowListener(new MyWindowAdapter());  
    }  
}
```

```
public void actionPerformed(ActionEvent ae)  
{  
    setVisible(true);  
}
```

```
class MyWindowAdapter extends WindowAdapter {  
    public void windowClosing(WindowEvent we)  
    {  
        System.exit(0);  
    }  
}
```

*Divisions.java - Notepad

File Edit Format View Help

```
import java.awt.*;  
  
import java.awt.event.*;  
  
public class Divisions extends Frame implements ActionListener  
{  
  
    Dialog d;  
    TextField Num1,Num2,result;  
    Button Divide;  
    public Divisions()  
  
    {  
  
        setLayout(new FlowLayout());  
        setSize(500,500);  
        Num1=new TextField(10);  
        Num2=new TextField(10);  
        result=new TextField(10);  
        Divide=new Button("DIVIDE ");  
        add(new Label("Enter 1st number : "));  
        add(Num1);  
        add(new Label("Enter 2nd nummber: "));  
        add(Num2);  
        add(new Label("Result : "));  
        add(result);  
        add(Divide);  
        Divide.addActionListener(this);  
        setVisible(true);  
        addWindowListener(new MyWindowAdapter());  
    }  
}
```

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Windows (CRLF)

UTF-8

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```
public void actionPerformed(ActionEvent ae)

{
    if(ae.getSource()==Divide)
    {
        try
        {

            result.setText(Integer.toString((Integer.parseInt(Num1.getText().trim()))/(Integer.parseInt(Num2.getText().trim()))));
        }

        catch(ArithmetricException aex)
        {
            Dia d1=new Dia("Arithmetric Exception");
            d1.setVisible(true);
        }

        catch(NumberFormatException nfe)
        {
            Dia d2=new Dia("Number Format Exception ");
            d2.setVisible(true);
        }
    }
}
```



*Divisions.java - Notepad

File Edit Format View Help

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

}

class Dia extends Dialog implements ActionListener
{
    Button ok;
    Dia(String str)
    {
        super(new Frame(),str,true);
        ok=new Button("OK");
        setLayout(new FlowLayout());
        setSize(300,200);
        add(ok);
        ok.addActionListener(this);
        addWindowListener(new MyWindowAdapter());
    }

    public void actionPerformed(ActionEvent ae)
```

Ln 60, Col 69

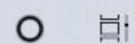
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Windows (CRLF)

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*Divisions.java - Notepad
File Edit Format View Help

```
ok=new Button("OK");

setLayout(new FlowLayout());

setSize(300,200);
add(ok);
ok.addActionListener(this);
addWindowListener(new MyWindowAdapter());
}

public void actionPerformed(ActionEvent ae)

{

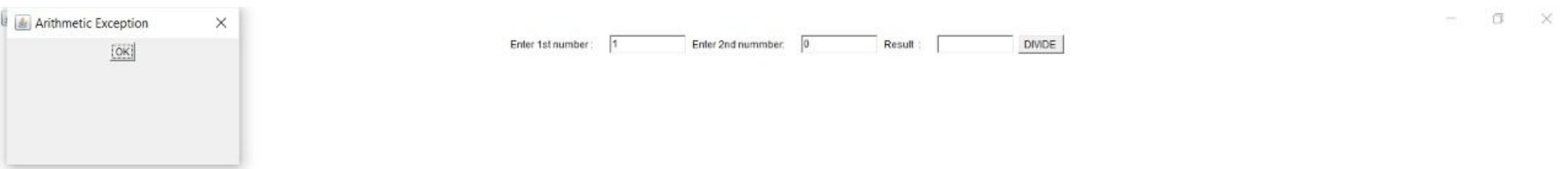
    setVisible(true);
    dispose();

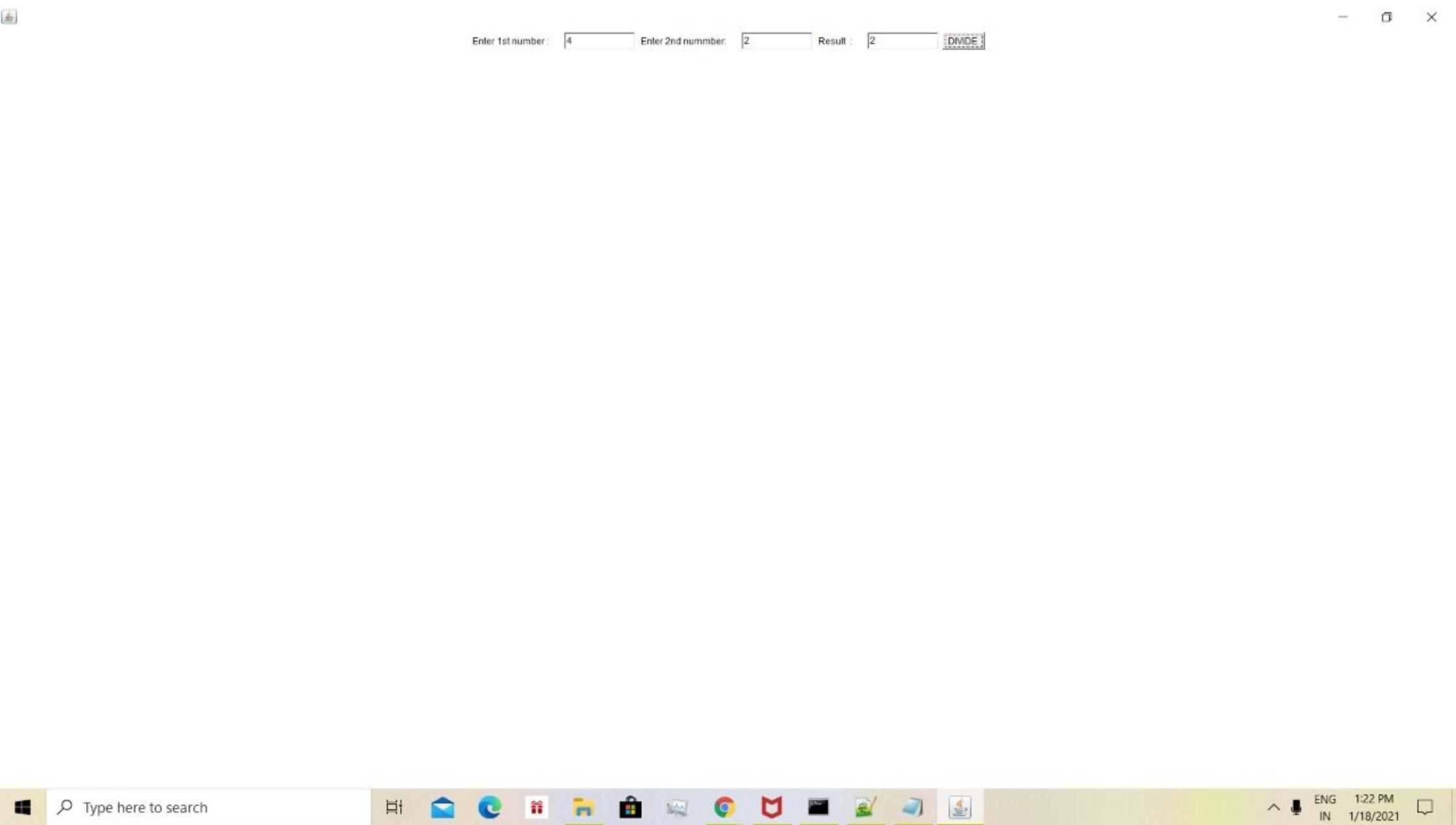
}

class MyWindowAdapter extends WindowAdapter{
public void windowClosing(WindowEvent we)
{
System.exit(0);

}
}
}
```

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Number Format Exception X

[OK]

Enter 1st number: Enter 2nd number: Result: DIVIDE



