VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

Object Oriented Java Programming

(23CS3PCOOJ)

Submitted by

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in partial fulfilment for the award of the degree of
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Department of Computer Science and Engineering

CERTIFICATE

This is to certify that the Lab work entitled "Object Oriented Java Programming (23CS3PCOOJ)" carried out by Varun R**(1BM24CS430),** who is bonafide student of **B.M.S. College of Engineering.** It is in partial fulfilment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum. The Lab report has been approved as it satisfies the academic requirements in respect of an Object Oriented Java Programming (23CS3PCOOJ) work prescribed for the said degree.

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Program 1

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

Code:
```java
import java.util.Scanner;
public class Quadratic

{
    public static void main(String[] args)
    {
        int a;
        int b;
        int c;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter 'a' value: ");
        a= sc.nextInt();
        System.out.print("Enter 'b' value: ");
        b=sc.nextInt();
        System.out.print("Enter 'c' value: ");
        c=sc.nextInt();
        float disc = ((b*b)-4*a*c);
        System.out.println(disc);
        if (a==0)
        {
            System.out.println("Not Quadratic");
        }
        else
        {
            if (disc<0)
            {
            System.out.println("No real roots ");
            }
            else if (disc>0)
            {
            double root1= (-b + Math.sqrt(disc))/(2*a);
            double root2= (-b - Math.sqrt(disc))/(2*a);
            System.out.println("Real roots ");
```

```java
        System.out.println("Root-1: "+root1);
        System.out.println("Root-2: "+root2);
        }
        else
        {
        double root1=(-b)/(2*a);
        System.out.println("Real and equal");
        System.out.println("Root-1: "+root1);
        System.out.println("Root-2: "+root1);
        }
      System.out.println("Hemanth Kumar R");
      System.out.println("1BM23CS110");

    }
  }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Quadratic
Enter 'a' value: 3
Enter 'b' value: 8
Enter 'c' value: 1
52.0
Real roots
Root-1: -0.13148290817867028
Root-2: -2.5351837584879964
Hemanth Kumar R
1BM23CS110

C:\Users\heman\OneDrive\Desktop\1BM23CS110>javac Quadratic.java

C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Quadratic
Enter 'a' value: 4
Enter 'b' value: 4
Enter 'c' value: 1
0.0
Real and equal
Root-1: 0.0
Root-2: 0.0
Hemanth Kumar R
1BM23CS110
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Quadratic
Enter 'a' value: 0
Enter 'b' value: 1
Enter 'c' value: 2
1.0
Not Quadratic

C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Quadratic
Enter 'a' value: 1
Enter 'b' value: 1
Enter 'c' value: 1
-3.0
No real roots
Hemanth Kumar R
1BM23CS110
```

Program 2

Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

Code:

```java
import java.util.Scanner;

class Student {
    private String name;
    private String usn;
    private double total_credit;
    private double[] marks;
    private Scanner sc = new Scanner(System.in);

    void getInfo() {
        System.out.print("Enter Name: ");
        name = sc.nextLine();

        System.out.print("Enter USN: ");
        usn = sc.nextLine();

        System.out.print("Enter Total Credits: ");
        total_credit = sc.nextDouble();
        sc.nextLine();
    }

    double grade(double mark) {
        if (mark <= 39) {
            return 0;
        } else if (mark >= 40 && mark <= 49) {
            return 4;
        } else if (mark >= 50 && mark <= 54) {
            return 5;
        } else if (mark >= 55 && mark <= 59) {
            return 6;
        } else if (mark >= 60 && mark <= 69) {
            return 7;
        } else if (mark >= 70 && mark <= 79) {
            return 8;
```

```java
    } else if (mark >= 80 && mark <= 89) {
      return 9;
    } else {
      return 10;
    }
  }

  void getMarks() {
    marks = new double[8];
    for (int i = 0; i < 8; i++) {
      System.out.println("Enter the marks for subject " + (i + 1) + ": ");
      double mark = sc.nextDouble();

      System.out.println("Enter the credit for subject " + (i + 1) + ": ");
      double credit = sc.nextDouble();

      double grade = grade(mark);
      marks[i] = grade * credit;
    }
    sc.nextLine();
  }

  void calSgpa() {
    double totalMarks = 0;
    for (int i = 0; i < 8; i++) {
      totalMarks += marks[i];
    }
    System.out.println("Name: " + name);
    System.out.println("USN: " + usn);
    System.out.println("SGPA: " + (totalMarks / total_credit));
  }
}

public class Main {
  public static void main(String args[]) {
    boolean cond = true;
    Scanner sc = new Scanner(System.in);
    while (cond) {
      Student s1 = new Student();
```

```java
        s1.getInfo();
        s1.getMarks();
        s1.calSgpa();

        System.out.println("Do you want to calculate SGPA for another student?
(yes/no): ");
        String check = sc.nextLine();
        if (check.equalsIgnoreCase("yes")) {
            continue;
        } else {
            cond = false;
        }
    }
      System.out.println("Hemanth Kumar R");
    System.out.println("1BM23CS110");
    sc.close();
  }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Main
Enter Name: HK
Enter USN: 1BM23CS200
Enter Total Credits: 20
Enter the marks for subject 1:
76
Enter the credit for subject 1:
2
Enter the marks for subject 2:
78
Enter the credit for subject 2:
2
Enter the marks for subject 3:
98
Enter the credit for subject 3:
2
Enter the marks for subject 4:
99
Enter the credit for subject 4:
2
Enter the marks for subject 5:
90
Enter the credit for subject 5:
2
Enter the marks for subject 6:
76
Enter the credit for subject 6:
2
Enter the marks for subject 7:
86
Enter the credit for subject 7:
4
Enter the marks for subject 8:
87
Enter the credit for subject 8:
4
Name: HK
USN: 1BM23CS200
SGPA: 9.0
Do you want to calculate SGPA for another student? (yes/no):
no
Hemanth Kumar R
1BM23CS110
```

Program 3

Create a class Book which contains four members: name, author, price, num_pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a toString( ) method that could display the complete details of the book. Develop a Java program to create n book objects.

Code:

```java
import java.util.Scanner;

class Book {
    public String book_name;
    public String author_name;
    public int price;
    public int num_pages;

    Book(String book_name, String author_name, int price, int num_pages) {
        this.book_name = book_name;
        this.author_name = author_name;
        this.price = price;
        this.num_pages = num_pages;
    }

    @Override
    public String toString() {
        String name, author, price, numPages;
        name = "Book Name: " + this.book_name + "\n";
        author = "Author Name: " + this.author_name + "\n";
        price = "Price: " + this.price + "\n";
        numPages = "Number of Pages: " + this.num_pages + "\n";
        return name + author + price + numPages;
    }
}

public class ride {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Number of books: ");
        int count = sc.nextInt();
        sc.nextLine();
```

```java
        Book[] arr = new Book[count];
        for (int i = 0; i < count; i++) {
            System.out.print("Enter book " + (i + 1) + " name: ");
            String name = sc.nextLine();
            System.out.print("Enter author " + (i + 1) + " name: ");
            String author = sc.nextLine();
            System.out.print("Enter book " + (i + 1) + " price: ");
            int price = sc.nextInt();
            System.out.print("Enter book " + (i + 1) + " pages: ");
            int pages = sc.nextInt();
            sc.nextLine();

            arr[i] = new Book(name, author, price, pages);
            System.out.println(arr[i]);
        }

        sc.close();

        System.out.println("Hemanth Kumar R");
        System.out.println("1BM23CS110");
    }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Ride
Number of books: 2
Enter book 1 name: kdsm
Enter author 1 name: dsad
Enter book 1 price: 200
Enter book 1 pages: 250
Book Name: kdsm
Author Name: dsad
Price: 200
Number of Pages: 250

Enter book 2 name: skfmks
Enter author 2 name: gkdfmgk
Enter book 2 price: 400
Enter book 2 pages: 340
Book Name: skfmks
Author Name: gkdfmgk
Price: 400
Number of Pages: 340

Hemanth Kumar R
1BM23CS110
```

Program 4

Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea( ). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape.

Code:

```java
import java.util.Scanner;

abstract class Shape {
    double dim1;
    double dim2;

    abstract void printarea();
}

class Rectangle extends Shape {
    Rectangle(double d1, double d2) {
        this.dim1 = d1;
        this.dim2 = d2;
    }

    @Override
    void printarea() {
        double area = dim1 * dim2;
        System.out.println("Area of Rectangle: " + area);
    }
}

class Triangle extends Shape {
    Triangle(double base, double height) {
        this.dim1 = base;
        this.dim2 = height;
    }

    @Override
    void printarea() {
        double area = 0.5 * dim1 * dim2;
```

```java
            System.out.println("Area of Triangle: " + area);
    }
}

class Circle extends Shape {
    Circle(double radius) {
        this.dim1 = radius;
    }

    @Override
    void printarea() {
        double area = 3.14 * dim1 * dim1;
        System.out.println("Area of Circle: " + area);
    }
}

public class area {
    public static void main(String[] args) {
        try (Scanner sc = new Scanner(System.in)) {
            System.out.println("Enter length and breadth of Rectangle:");
            double rl = sc.nextDouble();
            double rb = sc.nextDouble();
            Rectangle r1 = new Rectangle(rl, rb);
            r1.printarea();

            System.out.println("Enter base and height of Triangle:");
            double base = sc.nextDouble();
            double height = sc.nextDouble();
            Triangle t1 = new Triangle(base, height);
            t1.printarea();

            System.out.println("Enter the Radius:");
            double radius = sc.nextDouble();
            Circle c1 = new Circle(radius);
            c1.printarea();
        }

        System.out.println("Hemanth Kumar R");
        System.out.println("1BM23CS110");
    }
```

}

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Area
Enter length and breadth of Rectangle:
3
4
Area of Rectangle: 12.0
Enter base and height of Triangle:
4
5
Area of Triangle: 10.0
Enter the Radius:
5
Area of Circle: 78.5
Hemanth Kumar R
1BM23CS110
```

Program 5

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Cur-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:

a) Accept deposit from customer and update the balance.
b) Display the balance.
c) Compute and deposit interest
d) Permit withdrawal and update the balance Check for the minimum balance, impose penalty if necessary and update the balance.

Code:
```java
import java.util.Scanner;

class Account{
  Scanner sc=new Scanner(System.in);

  String name="HK";
  int money;
  String type;
  int accno;
  Account(String acctype,int accno){
    this.type=acctype;
    this.money=0;
    this.accno=accno;

  }
  void accdetail(){
    System.out.println("Account Holder Name: "+name);
    System.out.println("Account No: "+accno);
    System.out.println("Balance: "+money);
    System.out.println(this.type);
  }

  void deposit(){
    int mon;
```

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```java
    System.out.println(accno);
    System.out.println(type);
    System.out.println("Enter the Amount: ");
    mon=sc.nextInt();
    money+=mon;
    System.out.println("Balance: "+money);
  }

  void withdraw(){
    System.out.println(this.accno);
    System.out.println(type);
    int mon;
    System.out.println("Enter the Amount: ");
    mon=sc.nextInt();
    money-=mon;
    System.out.println("Balance: "+money);
    if((money<=100) && this.type=="current_account")
    {
      System.out.println("Minimum balance is 100");
      System.out.println("Deposite money now and pay the fine of 50");
    }
  }
  void cal_intrest(){
    if(this.type=="saving_account")
    {

      System.out.println(this.type);
      double temp=this.money;

      double intrest=((temp)*0.5)+temp;
      System.out.println("The intrest: "+intrest);
    }

    else
    {
      System.out.println("Not a saving account");
    }

  }
}
```

```java
public class Sys {
  public static void main(String[] args) {
    Account c1=new Account("saving_account",1);
    Account c2=new Account("current_account",2);

    while(true)
    {
     Scanner sc=new Scanner(System.in);

     int choice;
     System.out.println("Enter the choice:\n1.Deposite\n2.Withdraw\n3.Compute
intrest\n4.Display acc details\n5.Exit");
     choice=sc.nextInt();
     if (choice==1)
     {
      c1.deposit();
      c2.deposit();
     }

     if(choice==2){
       c1.withdraw();
       c2.withdraw();
     }

     if(choice==3){
      c1.cal_intrest();
      c2.cal_intrest();
     }

     if(choice==4){
      c1.accdetail();
      c2.accdetail();
     }

     if(choice==5){
      break;
     }
    }
```

```java
    System.out.println("Hemanth Kumar R");
    System.out.println("1BM23CS110");
  }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java sys
Enter the choice:
1.Deposite
2.Withdraw
3.Compute intrest
4.Display acc details
5.Exit
1
1
saving_account
Enter the Amount:
300
Balance: 300
2
current_account
Enter the Amount:
400
Balance: 400
Enter the choice:
1.Deposite
2.Withdraw
3.Compute intrest
4.Display acc details
5.Exit
4
Account Holder Name: HK
Account No: 1
Balance: 300
saving_account
Account Holder Name: HK
Account No: 2
Balance: 400
current_account
Enter the choice:
1.Deposite
2.Withdraw
3.Compute intrest
4.Display acc details
5.Exit
5
Hemanth Kumar R
1BM23CS110
```

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.

Code:
```java
package CIE;

import java.util.Scanner;

public class Internals extends Student {

    int[] cieMarks = new int[5];

    public void inputCIEMarks() {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter CIE marks for 5 subjects:");
        for (int i = 0; i < 5; i++) {
            System.out.print("Subject " + (i + 1) + ": ");
            cieMarks[i] = s.nextInt();
        }
    }

    public int[] getCieMarks() {
        return cieMarks;
    }
}


package CIE;

import java.util.Scanner;

public class Student {
    protected String usn;
    protected String name;
```

```java
    protected int sem;

    public void inputStudentDetails() {
        Scanner s = new Scanner(System.in);
        System.out.print("Enter USN: ");
        usn = s.nextLine();
        System.out.print("Enter Name: ");
        name = s.nextLine();
        System.out.print("Enter Semester: ");
        sem = s.nextInt();
    }

    public void displayStudentDetails() {
        System.out.println("USN: " + usn);
        System.out.println("Name: " + name);
        System.out.println("Semester: " + sem);
    }
}

package SEE;

import CIE.Student;
import java.util.Scanner;

public class External extends Student {
    int[] seeMarks = new int[5];

    public void inputSEEMarks() {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter SEE marks for 5 subjects:");
        for (int i = 0; i < 5; i++) {
            System.out.print("Subject " + (i + 1) + ": ");
            seeMarks[i] = s.nextInt();
        }
    }

    public int[] getSeeMarks() {
        return seeMarks;
    }
}
```

```java
import CIE.Internals;
import SEE.External;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter the number of students: ");
        int numStudents = sc.nextInt();
        sc.nextLine();

        Internals[] cieStudents = new Internals[numStudents];
        External[] seeStudents = new External[numStudents];

        for (int i = 0; i < numStudents; i++) {
            System.out.println("\nEnter details for student " + (i + 1) + ":");

            cieStudents[i] = new Internals();
            cieStudents[i].inputStudentDetails();
            cieStudents[i].inputCIEMarks();

            seeStudents[i] = new External();
            seeStudents[i].inputSEEMarks();
        }

        System.out.println("\nFinal marks for each student:");
        for (int i = 0; i < numStudents; i++) {
            System.out.println("\nDetails for student " + (i + 1) + ":");
            cieStudents[i].displayStudentDetails();

            int[] cieMarks = cieStudents[i].getCieMarks();
            int[] seeMarks = seeStudents[i].getSeeMarks();
            int[] finalMarks = new int[5];

            System.out.println("Final marks in each subject:");
            for (int j = 0; j < 5; j++) {
                finalMarks[j] = cieMarks[j] + seeMarks[j];
```

```java
                System.out.println("Subject " + (j + 1) + ": " + finalMarks[j]);
            }
        }

        sc.close();

        System.out.println("Hemanth Kumar R");
        System.out.println("1BM23CS110");
    }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>javac Main.java

C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Main
Enter the number of students: 1

Enter details for student 1:
Enter USN: 343ewd
Enter Name: dsdsd
Enter Semester: 12
Enter CIE marks for 5 subjects:
Subject 1: 23
Subject 2: 34
Subject 3: 45
Subject 4: 56
Subject 5: 67
Enter SEE marks for 5 subjects:
Subject 1: 76
Subject 2: 65
Subject 3: 54
Subject 4: 43
Subject 5: 32

Final marks for each student:

Details for student 1:
USN: 343ewd
Name: dsdsd
Semester: 12
Final marks in each subject:
Subject 1: 99
Subject 2: 99
Subject 3: 99
Subject 4: 99
Subject 5: 99
Hemanth Kumar R
1BM23CS110
```

Program 7

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 Wrong Age( ) when the input age=father's age.

Code:

```java
import java.util.Scanner;

class WrongAge extends Exception {

    public WrongAge() {
        super("Age Error");
    }

    public WrongAge(String message) {
        super(message);
    }
}

class Father {
    protected int fatherAge;

    public Father() throws WrongAge {
        Scanner s = new Scanner(System.in);
        System.out.print("Enter Father's Age: ");
        fatherAge = s.nextInt();
        if (fatherAge < 0) {
            throw new WrongAge("Age cannot be negative");
        }
    }

    public void display() {
        System.out.println("Father's Age: " + fatherAge);
    }
}

class Son extends Father {
    private int sonAge;
```

```java
    public Son() throws WrongAge {
        super();
        Scanner s = new Scanner(System.in);
        System.out.print("Enter Son's Age: ");
        sonAge = s.nextInt();
        if (sonAge < 0) {
            throw new WrongAge("Age cannot be negative");
        } else if (sonAge >= fatherAge) {
            throw new WrongAge("Son's age cannot be greater than or equal to Father's
age");
        }
    }

    @Override
    public void display() {
        super.display();
        System.out.println("Son's Age: " + sonAge);
    }
}

public class Main {
    public static void main(String[] args) {
        try {
            Son son = new Son();
            son.display();
        } catch (WrongAge e) {
            System.out.println("Exception Caught: " + e.getMessage());
        }

        System.out.println("Hemanth Kumar R");
        System.out.println("1BM23CS110");
    }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>javac Main.java

C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Main
Enter Father's Age: 34
Enter Son's Age: 35
Exception Caught: Son's age cannot be greater than or equal to Father's age
Hemanth Kumar R
1BM23CS110

C:\Users\heman\OneDrive\Desktop\1BM23CS110>
```

Program 8

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.

Code:

```java
import java.util.Scanner;

class WrongAge extends Exception {

    public WrongAge() {
        super("Age Error");
    }

    public WrongAge(String message) {
        super(message);
    }
}

class Father {
    protected int fatherAge;

    public Father() throws WrongAge {
        Scanner s = new Scanner(System.in);
        System.out.print("Enter Father's Age: ");
        fatherAge = s.nextInt();
        if (fatherAge < 0) {
            throw new WrongAge("Age cannot be negative");
        }
    }

    public void display() {
        System.out.println("Father's Age: " + fatherAge);
    }
}

class Son extends Father {
    private int sonAge;

    public Son() throws WrongAge {
```

```java
        super();
        Scanner s = new Scanner(System.in);
        System.out.print("Enter Son's Age: ");
        sonAge = s.nextInt();
        if (sonAge < 0) {
            throw new WrongAge("Age cannot be negative");
        } else if (sonAge >= fatherAge) {
            throw new WrongAge("Son's age cannot be greater than or equal to Father's
age");
        }
    }

    @Override
    public void display() {
        super.display();
        System.out.println("Son's Age: " + sonAge);
    }
}

public class Main {
    public static void main(String[] args) {
        try {
            Son son = new Son();
            son.display();
        } catch (WrongAge e) {
            System.out.println("Exception Caught: " + e.getMessage());
        }

        System.out.println("Hemanth Kumar R");
        System.out.println("1BM23CS110");
    }
}
```

```
C:\Users\heman\OneDrive\Desktop\1BM23CS110>java Main
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Program 9

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 Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Code:

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

public class IntegerDivisionGUI {

    public static void main(String[] args) {
        JFrame frame = new JFrame("Integer Division");
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setSize(400, 300);
        frame.setLayout(new FlowLayout());

        JLabel label1 = new JLabel("Num1: ");
        JTextField num1Field = new JTextField(10);

        JLabel label2 = new JLabel("Num2: ");
        JTextField num2Field = new JTextField(10);

        JButton divideButton = new JButton("Divide");
        JLabel resultLabel = new JLabel("Result: ");


        frame.add(label1);
        frame.add(num1Field);
        frame.add(label2);
        frame.add(num2Field);
        frame.add(divideButton);
        frame.add(resultLabel);

        divideButton.addActionListener(new ActionListener() {
```

```java
    @Override
    public void actionPerformed(ActionEvent e) {
      try {
        String num1Text = num1Field.getText();
        String num2Text = num2Field.getText();

        int num1 = Integer.parseInt(num1Text);
        int num2 = Integer.parseInt(num2Text);

        int result = num1 / num2;
        resultLabel.setText("Result: " + result);

      } catch (NumberFormatException ex) {
            JOptionPane.showMessageDialog(frame,
            "Invalid input. Please enter valid integers.",
            "Input Error", JOptionPane.ERROR_MESSAGE);

      } catch (ArithmeticException ex) {
            JOptionPane.showMessageDialog(frame,
            "Error: Division by zero is not allowed.",
            "Arithmetic Error", JOptionPane.ERROR_MESSAGE);
      }
    }
  });

    frame.setVisible(true);
  }
}
```