Object Orient Programming in Java

A Report submitted to the BMS College of engineering

Submitted by

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Contents

Lab 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:

```
import java.util.*;
public class Prog1 {
   public static void main(String[]args){
      Scanner in= new Scanner(System.in);
      System.out.println("Enter the coefficient a: ");
      double a = in.nextDouble();
      System.out.println("Enter the coefficient b: ");
      double b = in.nextDouble();
      System.out.println("Enter the coefficient c: ");
      double c = in.nextDouble();
      double d = discriminant(a,b,c);
      solution(a,b,d);
      System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
   }
   public static double discriminant(double a, double b, double c)
   {
      double d = Math.pow(b,2)-4*a*c;
      return d;
   }
   public static void solution(double a, double b, double d)
   {
      if(d>=0)
      {
         double x1=(-b+Math.sqrt(d))/(2*a);
         double x2=(-b+Math.sqrt(d))/(2*a);
         System.out.println("The roots are "+x1+" and "+x2);
      }
      else{
         System.out.println("No real Solutions");
      }
   }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog1.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog1
Enter the coefficient a:
1
Enter the coefficient b:
2
Enter the coefficient c:
1
The roots are -1.0 and -1.0
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog1.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog1
Enter the coefficient a:
1
Enter the coefficient b:
1
Enter the coefficient c:
1
No real Solutions
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$
```

Lab 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:

```
import java.util.*;
class Student{
        private String usn;
        private int [] marks;
        private int [] credits;
        private String name;

        public void accept(){
                Scanner in = new Scanner(System.in);
                System.out.println("Enter your name: ");
                name=in.nextLine();
                System.out.println("Enter your usn: ");
                usn=in.nextLine();
                System.out.println("Enter the number of subject: ");
                int n;
                n=in.nextInt();
                marks = new int[n];
                credits = new int[n];
                for(int i=0;i<n;i++){
                        System.out.println("Enter the marks of subject "+(i+1)+" : ");
                        marks[i]=in.nextInt();
                        System.out.println("Enter credits of subject "+(i+1)+" : ");
                        credits[i]=in.nextInt();
                }
                in.close();
        }
        public void display(){
                System.out.println("Name: "+name+" USN: "+usn);
                for(int i=0;i<marks.length;i++){
                        System.out.println("The marks of a subject "+(i+1)+" : "+marks[i]);
                        System.out.println("The credits of the subject : "+credits[i]);
                };
        }
        public void sgpa(){
```

```
                double score=0;
                double sum=0;

                for(int i=0;i<marks.length;i++){
                        double grade;
                        if(marks[i]>=90)grade=10;
                        else if(marks[i]>=80 && marks[i]<90)grade=9;
                        else if(marks[i]>=70 && marks[i]<80)grade=8;
                        else if(marks[i]>=60 && marks[i]<70)grade=7;
                        else if(marks[i]>=50 && marks[i]<60)grade=6;
                        else if(marks[i]>=40 && marks[i]<50)grade=5;
                        else grade=4;
                        sum=sum+credits[i];
                        score=score+credits[i]*grade;
                }
                score=score/sum;
                System.out.println("The SGPA of USN: "+usn+" Name: "+name+" is : "+score);
        }
}

public class Prog2{
        public static void main(String[]args){
                Student s= new Student();
                s.accept();
                s.display();
                s.sgpa();
                System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
        }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals$ javac Prog2.java
winterwizard@pop-os:~/Desktop/Java Practicals$ java Prog2
Enter your name:
Vishnu Kumar
Enter your usn:
1RV22AI100
Enter the number of subject:
8
Enter the marks of subject 1 :
87
Enter credits of subject 1 :
4
Enter the marks of subject 2 :
96
Enter credits of subject 2 :
4
Enter the marks of subject 3 :
97
Enter credits of subject 3 :
3
Enter the marks of subject 4 :
98
Enter credits of subject 4 :
3
Enter the marks of subject 5 :
89
Enter credits of subject 5 :
3
Enter the marks of subject 6 :
100
Enter credits of subject 6 :
1
Enter the marks of subject 7 :
99
Enter credits of subject 7 :
1
Enter the marks of subject 8 :
100
Enter credits of subject 8 :
1
Name: Vishnu Kumar USN: 1RV22AI100
The marks of a subject 1 : 87
The credits of the subject : 4
The marks of a subject 2 : 96
The credits of the subject : 4
The marks of a subject 3 : 97
The credits of the subject : 3
The marks of a subject 4 : 98
The credits of the subject : 3
The marks of a subject 5 : 89
1
Name: Vishnu Kumar USN: 1RV22AI100
The marks of a subject 1 : 87
The credits of the subject : 4
The marks of a subject 2 : 96
The credits of the subject : 4
The marks of a subject 3 : 97
The credits of the subject : 3
The marks of a subject 4 : 98
The credits of the subject : 3
The marks of a subject 5 : 89
The credits of the subject : 3
The marks of a subject 6 : 100
The credits of the subject : 1
The marks of a subject 7 : 99
The credits of the subject : 1
The marks of a subject 8 : 100
The credits of the subject : 1
The SGPA of USN: 1RV22AI100 Name: Vishnu Kumar is : 9.65
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals$
```

Lab 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:

```
import java.util.*;
class Book{
   private String name;
   private String author;
   private double price;
   private int num_pages;
   public Book(){
   }
   public Book(String name,String author, double price, int num_pages){
      this.author=author;
      this.name=name;
      this.price=price;
      this.num_pages=num_pages;
   }

   public void setName(String name){
      this.name=name;
   }
   public String getName(){
      return name;
   }

   public void setAuthor(String author){
      this.author=author;
   }

   public String getAuthor(){
      return name;
   }

   public void setPrice(double price){
      this.price=price;
   }
```

```
   public double getPrice(){
      return price;
   }

   public void setPages(int num_pages){
      this.num_pages=num_pages;
   }

   public int getPages(){
      return num_pages;
   }

   public String toString(){
      return "Book Name: "+name+" Author Name: "+author+" Price: "+price+" Pages:
"+num_pages;
   }

}
public class Prog3{
   public static void main(String[]args)
   {
      Scanner in =new Scanner(System.in);
      System.out.println("Enter number of books: ");
      int n=in.nextInt();
      Book [] books= new Book[n];
      for(int i=0;i<n;i++)
      {
         books[i]=new Book();
         System.out.println("Enter the name of book: ");
         String name=in.next();
         in.nextLine();
         System.out.println("Enter the author of book: ");
         String author=in.next();
         in.nextLine();
         System.out.println("Enter the price of the book: ");
         double price=in.nextDouble();
         System.out.println("Enter the number of pages: ");
         int num_pages=in.nextInt();

books[i].setName(name);books[i].setAuthor(author);books[i].setPrice(price);books[i].setPage
s(num_pages);
```

```
            System.out.println("Book: "+books[i].getName()+" Author: "+books[i].getAuthor()+"
details entered.");
        }
        for(int i=0;i<n;i++)
        {
            String s=books[i].toString();System.out.println(s);
        }
        System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
        in.close();
    }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals$ javac Prog3.java
winterwizard@pop-os:~/Desktop/Java Practicals$ java Prog3
Enter number of books:
2
Enter the name of book:
A
Enter the author of book:
B
Enter the price of the book:
234
Enter the number of pages:
568
Book: A Author: A details entered.
Enter the name of book:
C
Enter the author of book:
D
Enter the price of the book:
456
Enter the number of pages:
590
Book: C Author: C details entered.
Book Name: A Author Name: B Price: 234.0 Pages: 568
Book Name: C Author Name: D Price: 456.0 Pages: 590
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals$
```

Lab 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:

```
abstract class Shape{
   // private int a,b;
   Shape(){
   }
   abstract void printArea();
}

class Rectangle extends Shape{
   private int a, b;
      Rectangle(int a, int b)
   {
      this.a=a;
      this.b=b;
   }
   void printArea()
   {
      System.out.println("The area of rectangle is: "+(a*b));
   }
}

class Triangle extends Shape{
   private int a, b;
   Triangle(int a, int b)
   {
      this.a=a;
      this.b=b;
   }
   void printArea()
   {
      System.out.println("The area of triangle is: "+(0.5*a*b));
   }
}
```

```
class Circle extends Shape{
   private int a;
   Circle(int a)
   {
      this.a=a;
   }
   void printArea()
   {
      System.out.println("The area of circle is: "+(3.14*a*a));
   }
}

public class Prog4{
   public static void main(String[]args)
   {
      Shape rectangle=new Rectangle(3,6);
      Shape triangle=new Triangle(4,6);
      Shape circle=new Circle(5);
      rectangle.printArea();
      triangle.printArea();
      circle.printArea();
      System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
   }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals$ javac Prog4.java
winterwizard@pop-os:~/Desktop/Java Practicals$ java Prog4
The area of rectangle is: 18
The area of triangle is: 12.0
The area of circle is: 78.5
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals$
```

Lab 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:

```
import java.util.Scanner;
class Account{
   String name;
   String type;
   int acc_num;
   double dep;

   public void info(String name,String type,int acc_num, double dep){
      this.name=name;
      this.type=type;
      this.acc_num=acc_num;
      this.dep=dep;
   }

   public void details(){
      System.out.println("Name: "+name);
      System.out.println("Account Type: "+type);
      System.out.println("Account Number: "+acc_num);
      System.out.println("Current Balance: "+dep);
   }

}

class Savings extends Account{
```

```
    public void deposit(double amount){
        dep=dep+amount;
        System.out.println("Balance: "+dep);

    }
    public void withdraw(double amount)
    {
        if(dep<amount)
        {
            System.out.println("Enter insufficient funds.");
        }
        else{
            dep=dep-amount;
        }
        System.out.println("Balance: "+dep);
    }
    public void interest(double t, double r){
        double dep1=dep*Math.pow((1+r/100.0),t);
        System.out.println("Interest: "+(dep1-dep));dep=dep1;
        System.out.println("Interest Deposited Amount : "+dep);
    }
}

class Current extends Account{
    public void deposit(double amount){
        dep=dep+amount;
        System.out.println("Balance: "+dep);
    }
    public void withdraw(double amount)
    {
        if(dep<amount)
        {
            System.out.println("Enter insufficient funds.");
        }
        else{
            dep=dep-amount;
        }
        check(dep);
    }

    public void check(double amount)
```

```
   {
      if(dep<2000)
      {
         if(dep<500)
         {
            dep=0;
         }
         else
         {
            dep=dep-500;
         }
         System.out.println("Insufficient Balance!!!! Amount less than Rs. 2000. Rs. 500
deducted. Rs.");
      }
      System.out.println("Balance: "+dep);
   }
}

public class Prog5
{
   public static void main(String[]args)
   {
      Scanner in = new Scanner(System.in);
      int c1=1;
      while(c1==1)
      {
         System.out.println("Enter Name: ");
         String name=in.next();
         in.nextLine();
         System.out.println("Enter Account Number: ");
         int acc_no=in.nextInt();
         int choice1;
         System.out.println("1.Savings 2.Current");
         System.out.println("Enter Account Type: ");
         choice1=in.nextInt();
         switch (choice1){
            case 1:
               Savings s = new Savings();
               System.out.println("Enter deposit");
               double balance=in.nextDouble();
               s.info(name,"Savings",acc_no,balance);
```

```
            s.details();
            System.out.println("1.Deposit 2.Withdraw 3.Interest 4.Exit");int choice2;
            do{
            System.out.println("Enter your choice: ");
            choice2=in.nextInt();
            switch (choice2){
               case 1:
                  System.out.println("Enter amount: ");
                  double amount1 = in.nextDouble();
                  s.deposit(amount1);
                  break;
               case 2:
                  System.out.println("Enter amount: ");
                  double amount2 = in.nextDouble();
                  s.withdraw(amount2);
                  break;
               case 3:
                  System.out.println("Enter time period: ");
                  double time=in.nextDouble();
                  System.out.println("Enter rate: ");
                  double rate=in.nextDouble();
                  s.interest(time,rate);
                  break;
               case 4:
                  break;
               default:
                  System.out.println("Invalid choice.");
            }}while(choice2>=1&&choice2<=3);
            break;
         case 2:
            Current c=new Current();
            do{
               System.out.println("Enter deposit(>2000)");
               balance=in.nextDouble();
            }while(balance<2000);
            c.info(name,"Current",acc_no,balance);
            c.details();
            System.out.println("1.Deposit 2.Withdraw 3.Exit");
            int choice3;
            do{
            System.out.println("Enter your choice: ");
```

```
            choice3=in.nextInt();
            switch (choice3){
               case 1:
                  System.out.println("Enter amount: ");
                  double amount1 = in.nextDouble();
                  c.deposit(amount1);
                  break;
               case 2:
                  System.out.println("Enter amount: ");
                  double amount2 = in.nextDouble();
                  c.withdraw(amount2);
                  break;
               case 3:
                  break;
               default:
                  System.out.println("Invalid choice.");
            }}while(choice3>=1&&choice3<=2);
         default:
            System.out.println("Invalid Choice");
      }
      System.out.println("Enter 1 to continue or 0 to exit");
      int c2 =in.nextInt();c1=c2;
   }
   System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
  }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog5.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog5
Enter Name:
Mohan Kumar
Enter Account Number:
1
1.Savings 2.Current
Enter Account Type:
1
Enter deposit
7000
Name: Mohan
Account Type: Savings
Account Number: 1
Current Balance: 7000.0
1.Deposit 2.Withdraw 3.Interest 4.Exit
Enter your choice:
1
Enter amount:
1000
Balance: 8000.0
Enter your choice:
3
Enter time period:
3
Enter rate:
7
Interest: 1800.344000000001
Interest Deposited Amount : 9800.344000000001
Enter your choice:
4
Enter 1 to continue or 0 to exit
1
Enter Name:
Rahul
Enter Account Number:
6475786
1.Savings 2.Current
Enter Account Type:
2
Enter deposit(>2000)
4500
Name: Rahul
Account Type: Current
Account Number: 6475786
Current Balance: 4500.0
1.Deposit 2.Withdraw 3.Exit
Enter your choice:
2
Enter amount:
```

```
Name: Rahul
Account Type: Current
Account Number: 6475786
Current Balance: 4500.0
1.Deposit 2.Withdraw 3.Exit
Enter your choice:
2
Enter amount:
2900
Insufficient Balance!!!! Amount less than Rs. 2000. Rs. 500 deducted. Rs.
Balance: 1100.0
Enter your choice:
3
Invalid Choice
Enter 1 to continue or 0 to exit
0
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$
```

Lab 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:

```
package CIE;
public class Internals {
   int [] marks=new int[5];
   public void setMarks(int [] marks)
   {
      this.marks=marks;
   }
   public int [] getMarks(){
      return marks;
   }
}

package CIE;
public class Student{
   String usn;
   String name;
   int sem;
   public Student(){

   }
   public void setUSN(String usn){
      this.usn=usn;
   }
   public void setName(String name){
      this.name=name;
   }
   public void setSem(int sem)
   {
      this.sem=sem;
   }
   public String getName(){
      return name;
```

```
    }
    public String getUSN(){
        return usn;
    }
    public int getSem(){
        return sem;
    }
}

package SEE;
import CIE.Student;

public class Externals extends Student{
    int [] marks=new int[5];
    public Externals()
    {
        super();
    }
    public void setMarks(int [] marks)
    {
        this.marks=marks;
    }
    public int [] getMarks(){
        return marks;
    }
}

import CIE.*;
import SEE.*;
import java.util.*;
public class Prog6 {
    public static void main(String[]args)
    {
        Scanner in=new Scanner(System.in);
        System.out.println("Enter number of students:");
        int n=in.nextInt();int [] marks5=new int[5];
        Externals[] E=new Externals[n];
        Internals[] I=new Internals[n];
        for(int i=0;i<n;i++)
        {
            E[i]=new Externals();I[i]=new Internals();
```

```
        System.out.println("Enter Name:");
        String name=in.next();in.nextLine();

        System.out.println("Enter USN:");
        String usn=in.nextLine();
        System.out.println("Enter Semester:");
        int sem=in.nextInt();
        System.out.println("Enter CIE Marks:");int[] marks1=new int[5];
        E[i].setName(name);
        E[i].setUSN(usn);
        E[i].setSem(sem);
        for(int j=0;j<5;j++)
        {
           marks1[j]=in.nextInt();
        }
        I[i].setMarks(marks1);
        System.out.println("Enter SEE Marks:");int [] marks2=new int[5];
        for(int j=0;j<5;j++)
        {
           marks2[j]=in.nextInt();
        }
        E[i].setMarks(marks2);
        int[] marks3=E[i].getMarks();int[] marks4=I[i].getMarks();
        System.out.println("Name: "+E[i].getName()+"USN: "+E[i].getUSN()+" Semester:
                                  "+E[i].getSem());
        System.out.println("The marks of student are:");
        for(int j=0;j<5;j++)
        {
           marks5[j]=(marks3[j]/2)+marks4[j];
           System.out.println((marks5[j]));

        }
     }
     System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
  }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog6.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog6
Enter number of students:
2
Enter Name:
Ram Kumar
Enter USN:
01
Enter Semester:
2
Enter CIE Marks:
50
48
47
44
43
Enter SEE Marks:
100
90
99
98
96
Name: RamUSN: 01 Semester: 2
The marks of student are:
100
93
96
93
91
Enter Name:
```

```
Enter Name:

Mohan Kumar
Enter USN:
02
Enter Semester:
2
Enter CIE Marks:
50
45
46
44
43
Enter SEE Marks:
88
86
87
90
92
Name: MohanUSN: 02 Semester: 2
The marks of student are:
94
88
89
89
89
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$
```

Lab 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 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.

Code:

```
import java.util.*;
class WrongAge extends Exception {
   public WrongAge(String s) {
      super(s);
   }
}

class Father {
   int f;
   public Father() {
   }

   public Father(int f) {
      this.f = f;

   }

   public void checkFage() throws WrongAge {
      try {
         if (f < 0) {
            throw new WrongAge("incorrect father's age");
         }
      } catch (WrongAge e) {
         throw new WrongAge("incorrect father's age");
      }
   }

   public void printFage() {
      System.out.println("Father's age: " + f);
   }

}
```

```
class Son extends Father {
   int s, f;

   public Son() {

   }

   public Son(int f) {
      super(f);
   }

   public Son(int s, int f) {
      super(f);
      this.s = s;
      this.f = f;
   }

   public void checkSage() throws WrongAge {
      try {
         if (s >= f) {
            throw new WrongAge("incorrect son's age");
         }
      } catch (WrongAge e) {
         throw new WrongAge("incorrect son's age");
      }
   }

   public void printSage() {
      System.out.println("Son's age: " + s);
   }

}

public class Prog7 {
   public static void main(String[] args) {
      Scanner in = new Scanner(System.in);

      try {
         System.out.println("Enter father's age: ");
         int a1 = in.nextInt();
         Son son1 = new Son(a1);
```

```
            son1.checkFage();
            System.out.println("Enter son's age: ");
            int a2 = in.nextInt();
            Son son2 = new Son(a2, a1);
            son2.checkSage();
            son1.printFage();
            son2.printSage();
        } catch (WrongAge e) {
            System.out.println("Caught");
            System.out.println(e.getMessage());
        } finally{System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");}
    }

}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog7.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog7
Enter father's age:
-1
Caught
incorrect father's age
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog7
Enter father's age:
2
Enter son's age:
3
Caught
incorrect son's age
Name: D. V. Vedith Varma USN: 1BM22AI040
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$
```

Lab 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:

```
class NewThread implements Runnable {
   String Name;
   Thread t;
   int n;

   NewThread(String threadname, int n) {
      Name = threadname;
      this.n = n;
      t = new Thread(this, Name);
      System.out.println("New Thread " + t);
      t.start();
   }

   public void run() {
      try {
         for (int i = 0; i < 10; i++) {
            System.out.println(Name + " : " + i);
            Thread.sleep(n);
         }
      } catch (InterruptedException e) {
         System.out.println(Name + "Interrupted");
      }
      System.out.println("Exiting");
   }
}

public class Prog8 {
   public static void main(String[] args) {
      NewThread ob1 = new NewThread("CSE", 2000);
      NewThread ob2 = new NewThread("BMS College Of Engineering", 10000);
      System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
   }
}
```

Output:

```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog8.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog8
New Thread Thread[#20,CSE,5,main]
New Thread Thread[#21,BMS College Of Engineering,5,main]
Name: D. V. Vedith Varma USN: 1BM22AI040
BMS College Of Engineering : 0
CSE : 0
CSE : 1
CSE : 2
CSE : 3
CSE : 4
BMS College Of Engineering : 1
CSE : 5
CSE : 6
CSE : 7
CSE : 8
CSE : 9
BMS College Of Engineering : 2
Exiting
BMS College Of Engineering : 3
BMS College Of Engineering : 4
BMS College Of Engineering : 5
BMS College Of Engineering : 6
BMS College Of Engineering : 7
BMS College Of Engineering : 8
BMS College Of Engineering : 9
Exiting
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$
```

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

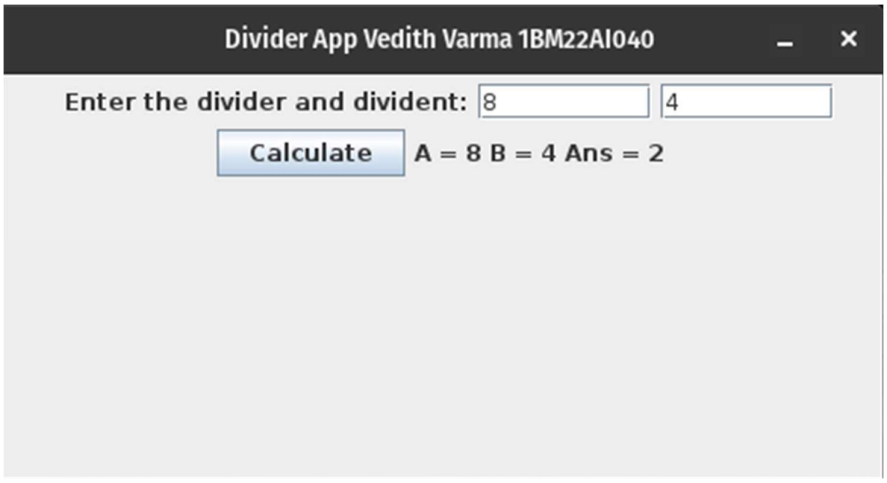
Code:

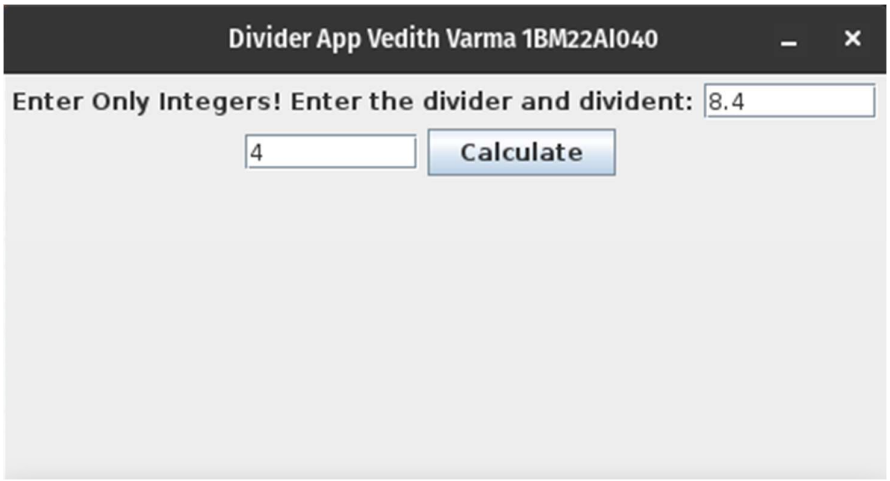
```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;

class Prog9{
   Prog9(){
      // create jframe container
      JFrame jfrm = new JFrame("Divider App Vedith Varma 1BM22AI040");
      jfrm.setSize(275, 150);
      jfrm.setLayout(new FlowLayout());
      // to terminate on close
      jfrm.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

      // text label
      JLabel jlab = new JLabel("Enter the divider and divident:");

      // add text field for both numbers
      JTextField ajtf = new JTextField(8);
      JTextField bjtf = new JTextField(8);

      // calc button
      JButton button = new JButton("Calculate");

      // labels
      JLabel err = new JLabel();
      JLabel alab = new JLabel();
      JLabel blab = new JLabel();
      JLabel anslab = new JLabel();

      // add in order :)
      jfrm.add(err);  // to display error bois
      jfrm.add(jlab);
      jfrm.add(ajtf);
```

```
jfrm.add(bjtf);
jfrm.add(button);
jfrm.add(alab);
jfrm.add(blab);
jfrm.add(anslab);

ActionListener l = new ActionListener() {
   public void actionPerformed(ActionEvent evt) {
      System.out.println("Action event from a text field");
   }
};
ajtf.addActionListener(l);
bjtf.addActionListener(l);

button.addActionListener(new ActionListener() {
   public void actionPerformed(ActionEvent evt) {
      try{
         int a = Integer.parseInt(ajtf.getText());
         int b = Integer.parseInt(bjtf.getText());
         int ans = a/b;

         alab.setText("\nA = " + a);
         blab.setText("\nB = " + b);
         anslab.setText("\nAns = "+ ans);
         err.setText("");
      }
      catch(NumberFormatException e){
         alab.setText("");
         blab.setText("");
         anslab.setText("");
         err.setText("Enter Only Integers!");
      }
      catch(ArithmeticException e){
         alab.setText("");
         blab.setText("");
         anslab.setText("");
         err.setText("B should be NON zero!");
      }
   }
});
```

```
        // display frame
        jfrm.setVisible(true);
    }

    public static void main(String args[]){
        // create frame on event dispatching thread
        SwingUtilities.invokeLater(new Runnable(){
            public void run(){
                new Prog9();
            }
        });
        System.out.println("Name: D. V. Vedith Varma USN: 1BM22AI040");
    }
}
```

Output:






```
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ javac Prog9.java
winterwizard@pop-os:~/Desktop/Java Practicals/dv_vedith_varma$ java Prog9
Name: D. V. Vedith Varma USN: 1BM22AI040
```