B.M.S. College of Engineering
(Autonomous Institution affiliated to VTU, Belagavi)

Department of Computer Science and Engineering

Laboratory Report

Submitted in partial fulfilment of the requirements for record of

OBJECT ORIENTED JAVA PROGRAMMING (23CS3PCOOJ)

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B.M.S COLLEGE OF ENGINEERING DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Lab program no 1:

Develop a Java program that prints all real solu ons to the quadra c equa on ax 2 +bx+c = 0. Read in a, b, c and use the quadra c formula. If the discriminate b 2 -4ac is nega ve, display a message sta ng that there are no real solu ons

```java
import java.util.Scanner;
public class QuadraticMain
{
    public static void main(String args[])
    {
        System.out.println("Shashidhar B M");
        System.out.println("1BM22CS257");
        Quadratic q = new Quadratic();
        q.getd();
        q.compute();
    }
}

class Quadratic
{
    int a, b, c;
    double r1, r2, d;
    void getd()
    {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the coefficients of a,b,c");
        a = s.nextInt();
        b = s.nextInt();
        c = s.nextInt();
    }
    void compute()
    {
```

```java
        while(a==0)
        {
            System.out.println("Not a quadratic equation");
            System.out.println("Enter a non zero value for a:");
            Scanner s = new Scanner(System.in);
            a = s.nextInt();
        }
        d = b*b-4*a*c;
        if(d==0)
        {
            r1 = (-b)/(2*a);
            System.out.println("Roots are real and equal");
            System.out.println("Roo1 = Root2 = " + r1);
        }
        else if(d>0)
        {
            r1 = ((-b)+(Math.sqrt(d)))/(double)(2*a);
            r2 = ((-b)-(Math.sqrt(d)))/(double)(2*a);
            System.out.println("Roots are real and distinct");
            System.out.println("Roo1 = " + r1 + " Root2 = " + r2);
        }
        else if(d<0)
        {
            System.out.println("Roots are imaginary");
            r1 = (-b)/(2*a);
            r2 = Math.sqrt(-d)/(2*a);
            System.out.println("Root1 = " + r1 + " + i"+r2);
            System.out.println("Root1 = " + r1 + " - i"+r2);
        }
    }
}
```

Lab program no 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.

```java
import java.util.Scanner;

class Subject{

int subjectMarks;

int credits;

int grades;

}

class Student{

Subject subject[];

String name;

String usn;

double SGPA;

Scanner s;

Student(){

subject = new Subject[9];

for(int i = 0;i<9;i++){

subject[i] = new Subject();

}

s= new Scanner(System.in);

}

void getStudentDetails(){
```

```java
System.out.println("Enter your name: ");
this.name = s.nextLine();
System.out.println("Enter your usn: ");
this.usn = s.next();
 }


 void getMarks(){
 for(int i = 0;i<8;i++){
 System.out.println("Enter the marks of the "+(i+1)+" subject");
 subject[i].subjectMarks = s.nextInt();


 System.out.println("Enter the credits of the "+(i+1)+" subject");
 subject[i].credits = s.nextInt();
 subject[i].grades = (subject[i].subjectMarks/10)+1;


 if(subject[i].grades >10){
 subject[i].grades = 10;
 }
 if(subject[i].grades <4){
 subject[i].grades = 0;
 }
 }
}


 void computeSGPA(){
 int sum=0;
 int totalCredits = 0;
 for(int i = 0;i<9;i++){
 sum+=(subject[i].grades * subject[i].credits);
 totalCredits += subject[i].credits;
```

```java
    }
   this.SGPA = (double) sum/totalCredits;
  }
}


public class Main{
 public static void main(String args[]){
  Student s1 = new Student();
  s1.getStudentDetails();
  s1.getMarks();
  s1.computeSGPA();


  System.out.println("Name: "+s1.name);
  System.out.println("Usn: "+s1.usn);
  System.out.println("SGPA: "+s1.SGPA);


  }
}
```
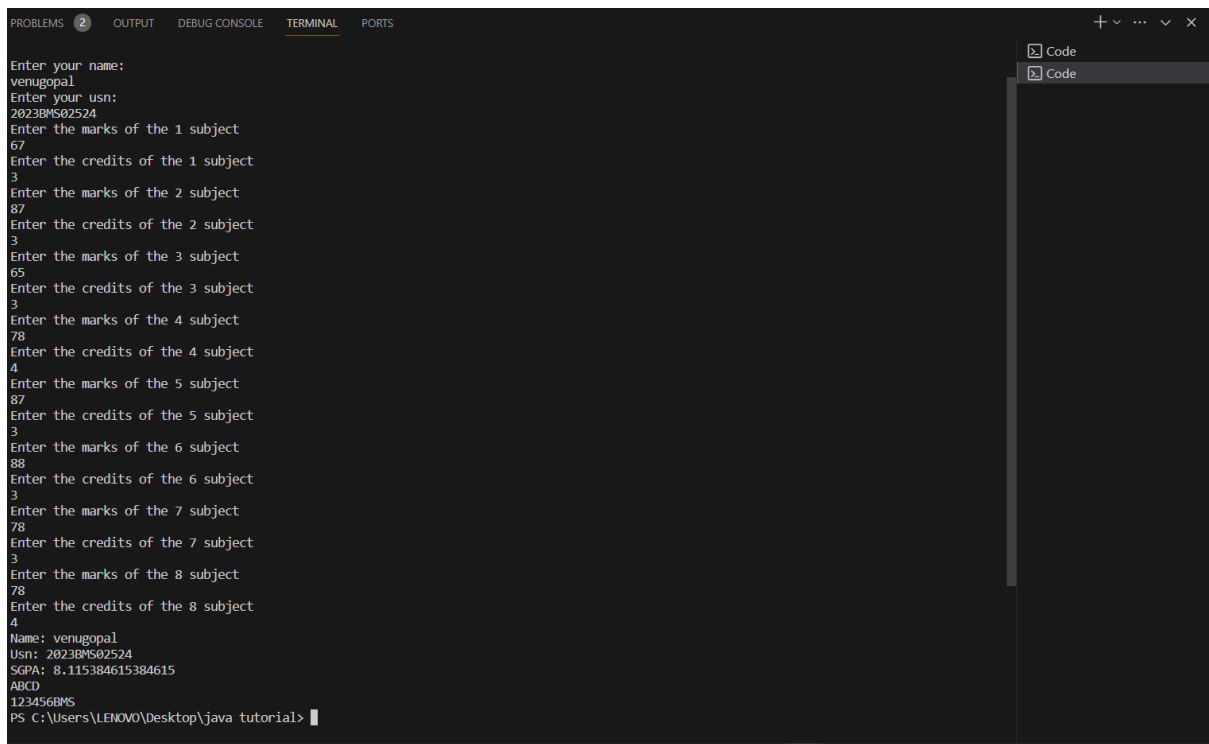
PROBLEMS 2   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

```
Enter your name:
venugopal
Enter your usn:
2023BMS02524
Enter the marks of the 1 subject
67
Enter the credits of the 1 subject
3
Enter the marks of the 2 subject
87
Enter the credits of the 2 subject
3
Enter the marks of the 3 subject
65
Enter the credits of the 3 subject
3
Enter the marks of the 4 subject
78
Enter the credits of the 4 subject
4
Enter the marks of the 5 subject
87
Enter the credits of the 5 subject
3
Enter the marks of the 6 subject
88
Enter the credits of the 6 subject
3
Enter the marks of the 7 subject
78
Enter the credits of the 7 subject
3
Enter the marks of the 8 subject
78
Enter the credits of the 8 subject
4
Name: venugopal
Usn: 2023BMS02524
SGPA: 8.115384615384615
ABCD
123456BMS
PS C:\Users\LENOVO\Desktop\java tutorial>
```

Lab Program no 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.

```java
import java.util.Scanner;

class Books{
 String name;
 String author;
 int price;
 int numPages;

 public Books(String name,String author,int price,int numPages){
 this.name = name;
 this.author = author;
 this.price = price;
 this.numPages = numPages;
 }
 public String toString(){
 String name, author, price, numPages;

 name = "Book name: " + this.name + "\n";
 author = "Author name: " + this.author + "\n";
 price = "Price: " + this.price + "\n";
 numPages = "Number of pages: " + this.numPages + "\n";

 return name + author + price + numPages;
 }
 void setName(String name){
```

```java
    this.name = name;

    }

    void setAuthor(String author){

    this.author = author;

    }

    void setPrice(int price){

    this.price = price;

    }

    void setNumPages(int numPages){

    this.numPages = numPages;

    }

    String getName(){

    return name;

    }

    String getAuthor(){

    return author;

    }

    int getPrice(){

    return price;

    }

    int getPgNum(){

    return numPages;

    }

}

class Main{

public static void main(String args[]){

    Scanner sc = new Scanner(System.in);

    int n, price, numPages;

    String name, author;

    System.out.println("Enter the number of books");

    n = sc.nextInt();
```

```java
   sc.nextLine();

  Books b[]= new Books[n];

  for(int i =0;i<n;i++){

   System.out.println("Read name of the book");

   name = sc.nextLine();

   System.out.println("Read author of the book");

   author = sc.nextLine();

   System.out.println("Read the price of the book");

   price = sc.nextInt();

   System.out.println("Read pgNumbers of the book");

   numPages = sc.nextInt();

   sc.nextLine();

   System.out.println("-------------------------------------
");

   b[i] = new Books(name,author,price,numPages);

  }

  for(int i =0;i<n;i++){

   String bookDetails = b[i].toString();

   System.out.println(bookDetails);

  }

  for(int i =0;i<n;i++){

   System.out.println("Book name is "+b[i].getName());

   System.out.println("Book author is "+b[i].getAuthor());

   System.out.println("Book price is "+b[i].getPrice());

   System.out.println("Book has number of pages =
"+b[i].getPgNum()+"\n");

  }


 }
 }
```

```
Enter your name:
venugopal
Enter your usn:
2023BMS02524
Enter the marks of the 1 subject
67
Enter the credits of the 1 subject
3
Enter the marks of the 2 subject
87
Enter the credits of the 2 subject
3
Enter the marks of the 3 subject
65
Enter the credits of the 3 subject
3
Enter the marks of the 4 subject
78
Enter the credits of the 4 subject
4
Enter the marks of the 5 subject
87
Enter the credits of the 5 subject
3
Enter the marks of the 6 subject
88
Enter the credits of the 6 subject
3
Enter the marks of the 7 subject
78
Enter the credits of the 7 subject
3
Enter the marks of the 8 subject
78
Enter the credits of the 8 subject
4
Name: venugopal
Usn: 2023BMS02524
SGPA: 8.115384615384615
ABCD
123456BMS
PS C:\Users\LENOVO\Desktop\java tutorial>
```

```
----------------------------------------
Book name: xxxxxxx
Author name: xxxxxxxxx
Price: 300
Number of pages: 323

Book name: xxxxxxxxxxx
Author name: xxxxxxxxxxx
Price: 399
Number of pages: 221

Book name: xxxxxxxxx
Author name: xxxxxxxxx
Price: 129
Number of pages: 234

Book name: xxxxxxxxx
Author name: xxxxxxxx
Price: 766
Number of pages: 356

Book name is xxxxxxx
Book author is xxxxxxxxx
Book price is 300
Book has number of pages = 323

Book name is xxxxxxxxxxx
Book author is xxxxxxxxxxx
Book price is 399
Book has number of pages = 221

Book name is xxxxxxxxx
Book author is xxxxxxxxx
Book price is 129
Book has number of pages = 234

Book name is xxxxxxxxx
Book author is xxxxxxxx
Book price is 766
Book has number of pages = 356

Name : venugopal
USN : 1BM22CS257
```

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.

import java.util.Scanner;

class InputScanner{

 Scanner s;

 InputScanner(){

```java
   s = new Scanner(System.in);
  }
 }
 abstract class Shape extends InputScanner{
  double a;
  double b;

  abstract void getInput();
  abstract void displayArea();
 }


 class Rectangle extends Shape{

  void getInput(){
   InputScanner is = new InputScanner();
   System.out.println("Enter the length and breadth of the rectangle
:");
   a = is.s.nextDouble();
   b = is.s.nextDouble();
  }
  void displayArea(){
   System.out.println("The area of the rectangle is :"+(a*b));
  }



 }
 class Triangle extends Shape{

  void getInput(){
   InputScanner is = new InputScanner();
   System.out.println("Enter the base and height of the triangle :");
```

```java
   a = is.s.nextDouble();

  b = is.s.nextDouble();

 }

 void displayArea(){

 System.out.println("The area of the triangle is :"+(a*b*0.5));

 }



}
class Circle extends Shape{


 void getInput(){

  InputScanner is = new InputScanner();

  System.out.println("Enter radius of the Cirlce :");

  a = is.s.nextDouble();

 }

 void displayArea(){

 System.out.println("The area of the Circle is :"+(3.14*a*a));

 }



}
public class AbstractMain{

 public static void main(String args[]){

 System.out.println("HI");

 Rectangle rect = new Rectangle();

 rect.getInput();

 rect.displayArea();


 Triangle triangle = new Triangle();

 triangle.getInput();
```

```
    triangle.displayArea();


  Circle circle = new Circle();

  circle.getInput();

  circle.displayArea();


}
}
```


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 facili es 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.

```
import java.util.*;
class Account{
String name;
int accno;
String type;
double balance;
private int mins=2000;
Account(String name,int accno,String type,double balance){
this.name = name;
```

```java
        this.accno = accno;

        this.type = type;

        this.balance = balance;

        if(balance<mins){

System.out.println("Insufficient balance");

        }

        }

        void deposit(double amount){

        balance +=amount;

        }

        void withdraw(double amount){

        if((balance-amount)>=0 ){

        balance -=amount;

        }

        else{

        System.out.println("Insufficient balance");

        return;

        }

        }

        void display(){

        System.out.println("Name : "+name+"\n"+

            "AccountNo : "+accno+"\n"+

            "Type : "+type+"\n"+

            "balance: "+balance+"\n");

        }

        }


class SavingAccount extends Account{

 private static int rate = 5;

 SavingAccount(String name,int accno,String type,double balance){

  super(name,accno,type,balance);
```

```java
 }
 void balanceWithInterest(){
  balance +=balance*rate/100;
  System.out.println("balance: "+balance);
 }


 }


 class CurrAccount extends Account{
  private static int minBalance = 2000;
  private static int charge  = 100;



  CurrAccount(String name,int accno,String type,double balance){
   super(name,accno,type,balance);
  }
  void checkMin(){
   if(balance<minBalance){
    System.out.println("Balance is less than min balance service
charge exposed " + charge);
    balance -=charge;
    return;
   }


   System.out.println("balanc is "+balance);
  }


 }



 public class Main{
```

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

    Scanner s = new Scanner(System.in);
    System.out.println("Enter your name: ");
    String name = s.nextLine();

    System.out.println("Enter the account type (current or deposit)");
    String type = s.next();

    System.out.println("Enter the account number: ");
    int accno = s.nextInt();

    System.out.println("Enter the initial balance: ");
    double balance = s.nextDouble();

    Account acc = new Account(name,accno,type,balance);
    SavingAccount sa =  new SavingAccount(name,accno,type,balance);
    CurrAccount ca = new CurrAccount(name,accno,type,balance);
    double amount;
    while(true){
     if(acc.type.equals("savings")){
      System.out.println("\n-------MENU------\n");
      System.out.println("1. Deposit \t2.Withdraw \t
3.compute interest for SavingsAccount \t 4.Display Account Details\n
5.Exit\t");

      System.out.println("Enter your choice");
      int choice = s.nextInt();
      switch(choice){
       case 1:System.out.println("Enter the deposit
amount");
```

```java
        amount = s.nextDouble();

        sa.deposit(amount);

        break;

      case 2: System.out.println("Enter the withdrawl
amount ");

        amount = s.nextDouble();

        sa.withdraw(amount);

        break;

      case 3:sa.balanceWithInterest();

        break;

      case 4:System.out.println("Details: ");

        sa.display();

        break;

      case 5: return;

      default: System.out.println("Invalid choice ");

      }

    }

    else{

    System.out.println("1. Deposit \t2.Withdraw \t
3.Display Account Details\n 4.Exit\t");

      System.out.println("Enter the choice");

      int choice = s.nextInt();

      switch(choice){

      case 1:System.out.println("Enter the amount : ");

          amount = s.nextInt();

          ca.deposit(amount);

        break;

      case 2:System.out.println("Enter the amount: ");

        amount = s.nextInt();

        ca.withdraw(amount);

        ca.checkMin();
```

```java
         break;
    case 3 : ca.display();
     break;
    case 4: System.exit(0);
   }


  }
 }
}
```

Lab program 6-a

Write a Java program to create a generic class Stack which hold 5 integers and 5 double values

and

String method demonstra ons

```java
import java.util.ArrayList;
import java.util.List;

class Stack<T> {
  private List<T> elements = new ArrayList<>();
  private int maxSize;

  public Stack(int maxSize) {
    this.maxSize = maxSize;
  }

  public void push(T element) {
    if (elements.size() < maxSize) {
      elements.add(element);
      System.out.println("Pushed: " + element);
```

```java
        } else {

            System.out.println("Stack is full. Cannot push more elements.");

        }

    }


    public T pop() {

        if (!elements.isEmpty()) {

            T poppedElement = elements.remove(elements.size() - 1);

            System.out.println("Popped: " + poppedElement);

            return poppedElement;

        } else {

            System.out.println("Stack is empty. Cannot pop elements.");

            return null;

        }

    }

}


public class Main {

    public static void main(String[] args) {

        // Creating a stack for integers

        Stack<Integer> intStack = new Stack<>(5);

        intStack.push(1);

        intStack.push(2);

        intStack.push(3);

        intStack.pop();

        intStack.push(4);

        intStack.push(5);

        intStack.push(6);


        Stack<Double> doubleStack = new Stack<>(5);

        doubleStack.push(1.1);
```

```java
        doubleStack.push(2.2);

        doubleStack.push(3.3);

        doubleStack.pop();

        doubleStack.push(4.4);

        doubleStack.push(5.5);

        doubleStack.push(6.6);



    }

}
```

Strings:

```java
import java.util.*;
class StringConstructor{
 public static void main(String args[]){


 System.out.println("Question : 1");


 String s1  = new String();

 s1 = "newString";

 char ch[]={'a','b','c','d'};

 String s2 = new String(ch);

 String demo = "Hello";

 String s = new String(demo);


 String charString = new String(ch,1,2);


 System.out.println(s1);

 System.out.println(s2);

 System.out.println(s);

 System.out.println(charString);
```

```java
System.out.println("Question : 2");

String name ="shashidhar";
String lname  = " B M ";
System.out.println("The first string length is "+name.length());
name = name.concat(lname);
System.out.println(name)
System.out.println("Question : 3");

Integer num = 9807;
String snum = num.toString();
System.out.println(snum);

System.out.println("Question : 4");

String extract = "Welcome to bmsce college";
char chs[] = new char[20];
extract.getChars(10,16,chs,0);
String ans = new String(chs);
System.out.println(ans);

System.out.println("Question : 5");

String myName = "shashihdar";
char charArray[] = myName.toCharArray();
for(char val: charArray){
 System.out.print(val+"\t");
}
System.out.println();
byte arr[] = myName.getBytes();
```

```java
        for(byte val: arr){
        System.out.print(val+"\t");
        }
        System.out.println();


        System.out.println("Question : 6");


        System.out.println("Bmsce".equals("Bmsce"));
        System.out.println("Bmsce".equals("College"));
        System.out.println("Bmsce".equals("BMSCE"));
        System.out.println("Bmsce".equalsIgnoreCase("BMSCE"));



    }
}
class Sorts{
 public static void main(String args[]){
  System.out.println("b".compareTo("a"));
  String st[] = {"van", "watch","ball", "cat","xmas","yatch"," zee",

 "apple","ice","jug","kite","lift","man","net","orange","dog","ent","free"
 ,"gun","hen","parrot","queen","ring","star","tree","umbrella"};
  for(int i =0;i<st.length();i++){
   for(int j =0;j<st.length();j++){
    if(st[i].compareTo(st[j])==1){
     String temp = st[i];
     st[i] = st[j];
     st[j] = temp;
    }
   }
  }
```

```java
    for(String c:st){
     System.out.println(c);
    }
  }
}
import java.util.*;

class Comparestrings{
 public static void main(String args[]){

  String subString = "Bmsce collge";
  String  val = "Welcome to Bmsce College of Engineering";
if(val.regionMatches(11,subString,0,5)){
System.out.println("String matches");
}
else{
}
System.out.println("String not matches");
System.out.println(subString.startsWith("B"));
System.out.println(subString.startsWith("r"));
String a = "Hello";
String b = "Hello";
String c = new String("Hello");
System.out.println(a==b);
System.out.println(b==c);
System.out.println(b.equals(c));
}
}
```

Lab program 6 -b packages

Create a package CIE which has two classes- Student and Internals. The class Student has members like usn, name, sem. The class Internals derived from Student 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.

CIE/Student.java

```java
package CIE;

import java.util.Scanner;

public class Student {

    protected String usn = new String();

    protected String name = new String();

    protected int sem;

    public void inputStudentDetails() {
        System.out.println("Enter the usn , name , sem :\n");
        Scanner sc = new Scanner(System.in);
        this.usn = sc.nextLine();
        name = sc.nextLine();
        sem = sc.nextInt();
    }
}
```

```java
    public void displayStudentDetails() {

        System.out.println("Student details are \n Name : name \n Usn : usn \n

Sem : sem \n");

    }

}


CIE/Internals.java


package CIE;

import java.util.Scanner;

public class Internals extends Student {

    protected int marks[] = new int[5];

    public void inputCIEmarks(){


        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the marks of 5 subject");

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

            marks[i] = sc.nextInt();

        }

    }

}


SEE/Externals.java

package SEE;

import CIE.*;

import java.util.Scanner;


public class Externals extends Internals {

    protected int marks[];

    protected int finalMarks[];

    public Externals() {
```

```java
        marks = new int[5]; finalMarks = new int[5];

    }

        public void inputSEEmarks() {

            Scanner s = new Scanner(System.in);

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

                System.out.print("Subject "+(i+1)+" marks: ");

                marks[i] = s.nextInt();

            }

        }


    public void calculateFinalMarks() {


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

            finalMarks[i] = marks[i]/2 + super.marks[i];

        }

    }


    public void displayFinalMarks() {

        displayStudentDetails();

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

            System.out.println("Subject " + (i+1) + ": " + finalMarks[i]);

        }

    }


}
Main.java import SEE.Externals;

import CIE.*;


class Main {


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

```java
        int numOfStudents = 2;

        Externals finalMarks[] = new Externals[numOfStudents];

        for(int i=0;i<numOfStudents;i++){

            finalMarks[i] = new Externals();

            finalMarks[i].inputStudentDetails();


            System.out.println("Enter CIE marks");

            finalMarks[i].inputCIEmarks();

            System.out.println("Enter SEE marks");

            finalMarks[i].inputSEEmarks();

        }

        System.out.println("Displaying data:\n");


        for(int i=0;i<numOfStudents;i++){

            finalMarks[i].calculateFinalMarks();

            finalMarks[i].displayFinalMarks();

        }


    }

}
```
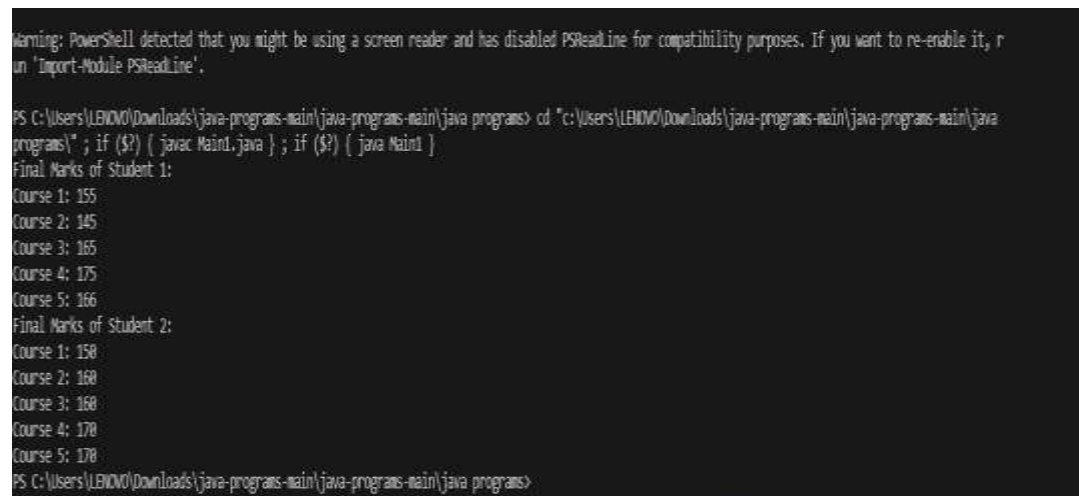


```
Warning: PowerShell detected that you might be using a screen reader and has disabled PSReadLine for compatibility purposes. If you want to re-enable it, r
un 'Import-Module PSReadLine'.

PS C:\Users\LENOVO\Downloads\java-programs-main\java-programs-main\java programs> cd "c:\Users\LENOVO\Downloads\java-programs-main\java-programs-main\java
programs\" ; if ($?) { javac Main1.java } ; if ($?) { java Main1 }
Final Marks of Student 1:
Course 1: 155
Course 2: 145
Course 3: 165
Course 4: 175
Course 5: 166
Final Marks of Student 2:
Course 1: 150
Course 2: 160
Course 3: 160
Course 4: 170
Course 5: 170
PS C:\Users\LENOVO\Downloads\java-programs-main\java-programs-main\java programs>
```

Lab program 7

Write a program that demonstrates handling of excep ons 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 excep on WrongAge( ) when the input age<0. In Son class, implement a constructor that cases both father and son's age and throws an excep on if son's age is >=father's age.

```java
import java.util.*;
class WrongAge extends Exception{
    public WrongAge(String s){
        super(s);
    }
}
class InputScanner{
    Scanner sc;
    public InputScanner(){
        sc = new Scanner(System.in);
    }
}

class Father extends InputScanner{
    int fatherAge;
    public Father() throws WrongAge{
        InputScanner ss = new InputScanner();
        System.out.println("Enter the father age: ");
        fatherAge = ss.sc.nextInt();
        if(fatherAge<0){
            throw new WrongAge("Age cannot be negative");
        }
    }
    void fdisplay(){
        System.out.println("Father age is : "+fatherAge);
```

```java
        }
    }


    class Son extends Father{
        int sonAge;
        public Son() throws WrongAge{
            InputScanner ss = new InputScanner();
            System.out.println("Enter the Son age: ");
            sonAge = ss.sc.nextInt();
            if(sonAge==fatherAge){
                throw new WrongAge("Son's age cannot be equal to father age");
            }
            else if(sonAge>fatherAge){
                throw new WrongAge("Son's age cannot be greater than father's age");
            }
            else if(sonAge<0){
                throw new WrongAge("Age cannot be negative");
            }
        }
        void sdisplay(){
            System.out.println("Son's age is :"+sonAge );
        }
    }


    public class PMain{
        public static void main(String args[]){
            Son p;
            try{
                p = new Son();
                p.fdisplay();
                p.sdisplay();
```

```
        }
      catch(WrongAge e){

        System.out.println(e);

      }


  }
}
```


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.

```
class Bms extends Thread {

  public void run() {

    for (int i = 1; i <= 50; i++) {

      try {

        Thread.sleep(10000);

        System.out.println("BMS College of Engineering" + i);

      } catch (InterruptedException e) {

        System.out.println("thread error");

      }

    }
```

```java
        }
    }


class Cse extends Thread {
    public void run() {
        for (int i = 1; i <= 50; i++) {
            try {
                Thread.sleep(2000);
                System.out.println("Computer Science " + i);
            } catch (InterruptedException e) {
                System.out.println("thread error");
            }
        }
    }
}


public class TreadsMain {
    public static void main(String args[]) {
        Bms c1 = new Bms();
        c1.start();


        Cse i1 = new Cse();
        i1.start();
    }
```

```
    }
```

Program 9:

```java
import java.awt.*;

import java.awt.event.*;

public class EventHandling extends WindowAdapter implements ActionListener {

    Frame f;
    TextField tf;

    EventHandling() {
        // Create components
```

```java
        f = new Frame();

        f.addWindowListener(this);


        tf = new TextField();

        tf.setBounds(60, 50, 170, 20);


        Button b = new Button("click me");

        b.setBounds(100, 120, 80, 30);


        // Register listener

        b.addActionListener(this); // Passing current instance


        // Add components and set size, layout, and visibility

        f.add(b);

        f.add(tf);

        f.setSize(300, 300);

        f.setLayout(null);

        f.setVisible(true);

    }


    public void actionPerformed(ActionEvent e) {

        tf.setText("Welcome");

    }


    public void windowClosing(WindowEvent e) {

        System.exit(0);

    }


    public static void main(String args[]) {

        new EventHandling();

    }
```
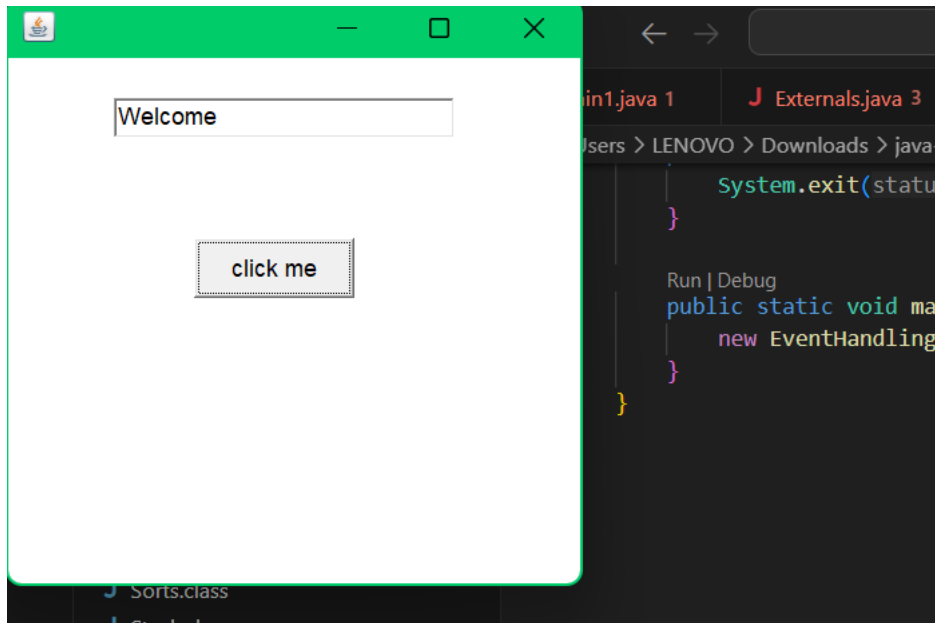
}

Program 10:

import java.awt.*;

import java.awt.event.*;

public class AWTExample extends WindowAdapter {

   Frame f;

  AWTExample() {

    f = new Frame();

    f.addWindowListener(this);

    Label label = new Label("Employee id:");

    Button button = new Button("Submit");

```java
        TextField textField = new TextField();

        label.setBounds(20, 80, 80, 30);

        textField.setBounds(20, 100, 80, 30);

        button.setBounds(100, 100, 80, 30);

        f.add(button);

        f.add(label);

        f.add(textField);

        f.setSize(400, 300);

        f.setTitle("Employee info");

        f.setLayout(null);

        f.setVisible(true);

    }

    public void windowClosing(WindowEvent e) {
        System.exit(0);
    }

    public static void main(String[] args) {
        AWTExample awt = new AWTExample();
```

```
    }

}
```