

B.M.S College of Engineering

(Autonomous Institution affiliated to VTU, Belagavi)
Bengaluru – 20

Department of Computer Science and Engineering

Report on

OOJP LAB PROGRAMS

Course Title:

Object Oriented Java Programming

Course Code: 19CS3PCOOJ

(Autonomous Scheme 2020)

Submitted by

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LAB PROGRAM 1

QUESTION

Develop a Java program that prints all real solutions to the quadratic equation $ax^2+bx+c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.

SOLUTION

```
import java.util.*;
public class Quadratic {

    public static void main(String[] args)
    {

        double a, b, c;
        double root1, root2;
        System.out.println("Enter values");
        Scanner input = new Scanner (System.in);
        a = input.nextDouble();
        b = input.nextDouble();
        c = input.nextDouble();

        double determinant = b * b - 4 * a * c;

        // condition for real and different roots
        if(determinant > 0)
```

```

{
    root1 = (-b + Math.sqrt(determinant)) / (2 * a);
    root2 = (-b - Math.sqrt(determinant)) / (2 * a);
    System.out.println("Real and Different roots");

    System.out.println("root1 and root2 =" + " " + root1 + " " + root2);
}
// Condition for real and equal roots
else if(determinant == 0)
{
    root1 = root2 = -b / (2 * a);
    System.out.println("Real and Equal roots");

    System.out.println("root1 = root2 = " + " " + root1);
}
// If roots are not real
else
{
    double realPart = -b / (2 * a);
    double imaginaryPart = Math.sqrt(-determinant) / (2 * a);

    System.out.println("There are no real solutions");

    System.out.println("real part = " + " " + realPart + " " + "and imaginary part =" + "
"+imaginaryPart);
}
}
}

```

OUTPUT

```
OOPS_Progs — -bash — 80x24
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ java Quadratic
Enter values
1
-5
2
Real and Different roots
root1 and root2 = 4.561552812808831 0.4384471871911697
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ javac Quadratic.java
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ java Quadratic
Enter values
1
2
1
Real and Equal roots
root1 = root2 = -1.0
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ javac Quadratic.java
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ java Quadratic
Enter values
3
2
1
There are no real solutions
real part = -0.3333333333333333 and imaginary part = 0.47140452079103173
[Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ ]
```

LAB PROGRAM 2

QUESTION

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.

SOLUTION

```
import java.util.Scanner;
```

```
class Student
{
    private String USN;
    private String name;
    private int n;
    private double SGPA = 0;
    private int totalCredits = 0;
    Scanner ss = new Scanner(System.in);
```

```

void Details()
{
    System.out.println("Enter USN of the student");
    USN = ss.nextLine();
    System.out.println("Enter Name of the student");
    name = ss.nextLine();
    System.out.println("Enter no of subjects");
    n = ss.nextInt();
    int credits[] = new int[n];
    double marks[] = new double[n];
    System.out.println("Enter details of the subjects:");
    for(int i=0;i<n;i++)
    {
        System.out.println("Enter credits allotted to the subject "+(i+1));
        credits[i] = ss.nextInt();
        System.out.println("Enter marks in the subject "+(i+1));
        marks[i] = ss.nextDouble();
        Calculate(credits[i],marks[i],i);
    }
}

void Calculate(int credit,double mark,int j)
{
    totalCredits = totalCredits + credit;
    if(mark>=90&&mark<=100)
        SGPA = SGPA + (10*credit);
    else if(mark>=80 && mark<=89)
        SGPA = SGPA + (9*credit);
    else if(mark>=70&&mark<=79)
        SGPA = SGPA + (8*credit);
    else if(mark>=60&&mark<=69)
        SGPA = SGPA + (7*credit);
    else if(mark>=50 && mark<=59)
        SGPA = SGPA + (6*credit);
    else if(mark>=40&&mark<=49)
        SGPA = SGPA + (5*credit);
    else
        System.out.println("Failed in subject "+(j+1));
}

void Display()
{
    System.out.println("Details of the Student");
    System.out.println("Name :"+name);
    System.out.println("USN: "+USN);
}

```

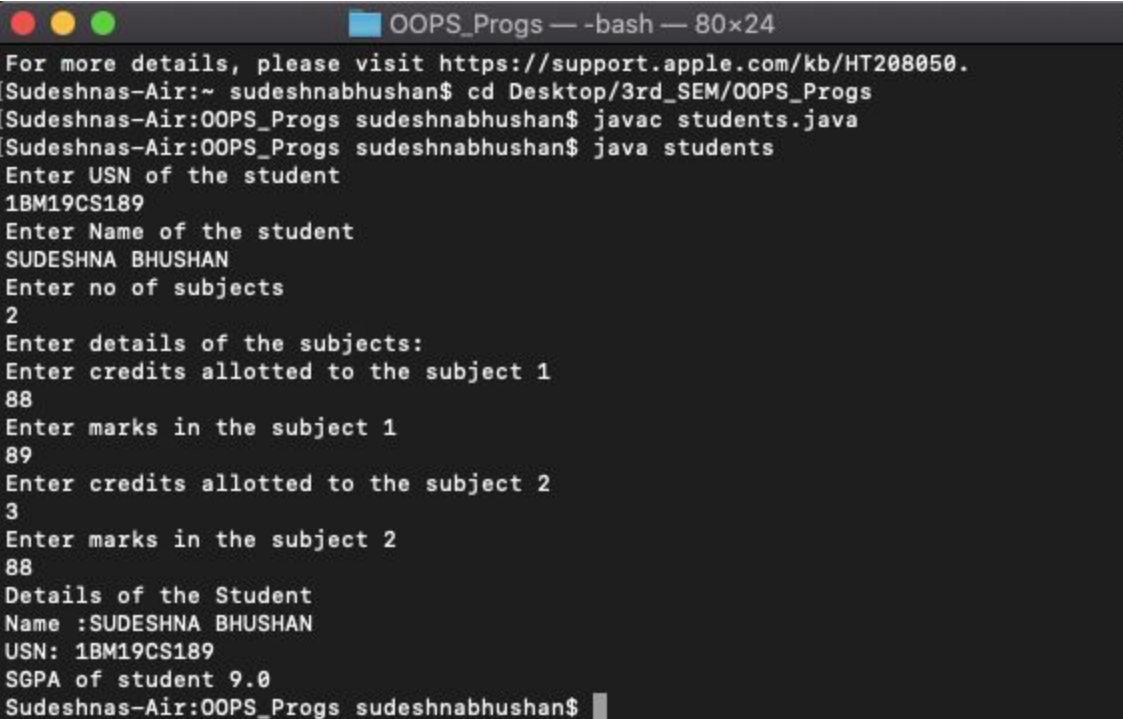
```

        System.out.println("SGPA of student "+(SGPA/totalCredits));
    }
}

public class students
{
    public static void main(String args[])
    {
        Student s1 = new Student();
        s1.Details();
        s1.Display();
    }
}

```

OUTPUT



```

OOPS_Progs — -bash — 80x24
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ javac students.java
Sudeshnas-Air:OOPS_Progs sudeshnabhushan$ java students
Enter USN of the student
1BM19CS189
Enter Name of the student
SUDESHNA BHUSHAN
Enter no of subjects
2
Enter details of the subjects:
Enter credits allotted to the subject 1
88
Enter marks in the subject 1
89
Enter credits allotted to the subject 2
3
Enter marks in the subject 2
88
Details of the Student
Name :SUDESHNA BHUSHAN
USN: 1BM19CS189
SGPA of student 9.0
Sudeshnas-Air:OOPS_Progs sudeshnabhushan$

```

LAB PROGRAM 3

QUESTION

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.

SOLUTION

```
import java.util.*;
class Book {
    String name;
    String author;
    int price;
    int num_pages;
    Book()
    {}
    Book(String name,String author,int price,int num_pages)
    {
        this.name=name;
        this.author=author;
        this.price=price;
        this.num_pages=num_pages;
    }
    void accept()
    {
        Scanner s=new Scanner(System.in);
        System.out.println("Enter the name of the book");
        name=s.next();
        System.out.println("Enter the author of the book");
        author=s.next();
        System.out.println("Enter the price of the book");
        price=s.nextInt();
        System.out.println("Enter the number of pages of the book");
        num_pages=s.nextInt();
    }
    public String toString()
    {
        return ("Name: "+name + "\n" + "Author: "+author + "\n" + "Price: "+price + "\n"
        +"Number of pages: "+num_pages );
    }
}
class BookMain {
```

```

public static void main(String ss[])
{
    Scanner a=new Scanner(System.in);
    Book b1=new Book("Heights","Anne",299,345);
    System.out.println("Sample input:\n"+b1);
    System.out.println("Enter the number of books");
    int n=a.nextInt();
    Book b[]=new Book[n];
    for(int i=0;i<n;i++)
    {
        b[i]=new Book();
        System.out.println("Enter the details of "+(i+1)+" book");
        b[i].accept();
    }
    for(int i=0;i<n;i++)
    {
        System.out.println("Details of book "+(i+1));
        System.out.println(b[i]);
    }
}
}

```

OUTPUT


```
OOPS_Progs — -bash — 80x24
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac lab4.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java lab4
Enter the no of books:
1
Enter the book details
Book 1
enter the name of book
sudeshna
enter the name of author
sudeshna
enter the price of book
120
enter the number of pages
12
Printing book details....
Book 1
Book: sudeshna
Author: sudeshna
Price: Rs 120.0
No.of pages: 12
-----
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$
```

LAB PROGRAM 4

QUESTION

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.

SOLUTION

```
import java.util.Scanner;
```

```

abstract class Shape
{
    int length,breadth;
    void printArea()
    {}
}
class Rectangle extends Shape
{
    double areaR;
    void printArea(){
        areaR=(length*breadth);
        System.out.println("The area of rectangle is "+areaR+" cm^2");
    }
}
class Triangle extends Shape
{
    double areaT;
    void printArea(){
        areaT=(0.5)*(length*breadth);
        System.out.println("The area of Triangle is "+areaT+"cm^2");
    }
}
class Circle extends Shape
{
    double areaC;
    void printArea(){
        areaC=(3.14)*(length*length);
        System.out.println("The area of circle is "+areaC+"cm^2");
    }
}
class Main
{
    public static void main(String args[])
    {
        Scanner A=new Scanner(System.in);
        Rectangle R1=new Rectangle();
        Triangle T1=new Triangle();
        Circle C1=new Circle();
        System.out.println("Enter the length and breadth of which u have to find the area of rectangle in cm\n");
        R1.length=A.nextInt();
        R1.breadth=A.nextInt();
    }
}

```

```
System.out.println("Enter the length and breadth of which u have to find the area of triangle in cm\n");
T1.length=A.nextInt();
T1.breadth=A.nextInt();
System.out.println("Enter the length of which u have to find the area of circle in cm\n");
C1.length=A.nextInt();
R1.printArea();
T1.printArea();
C1.printArea();
}
}
```

OUTPUT

```
OOPS_Progs — -bash — 80x24
Last login: Sun Nov  8 20:20:38 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac Main.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java Main
Enter the length and breadth of which u have to find the area of rectangle in cm

12
13
Enter the length and breadth of which u have to find the area of triangle in cm

12
13
Enter the length of which u have to find the area of circle in cm

12
The area of rectangle is 156.0 cm^2
The area of Triangle is 78.0cm^2
The area of circle is 452.16cm^2
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$
```

LAB PROGRAM 5

QUESTION

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 Curr-acct and Sav-acct to

make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:

Accept deposit from customer and update the balance. Display the balance.

Compute and deposit interest

Permit withdrawal and update the balance

Check for the minimum balance, impose penalty if necessary and update the balance.

SOLUTION

```
import java.util.Scanner;
class Bank
{
    int deposit_balance;
    int withdraw_balance;
    String customername;
    String Account_Number;
    String Account_Type;
    int Balance=27890;
    void accept()
    {
        Scanner s=new Scanner(System.in);
        System.out.println("Enter the customer name\n");
        customername=s.next();
        System.out.println("Enter the Account Number\n");
        Account_Number=s.next();
        System.out.println("Enter the Account type\n");
        Account_Type=s.next();
    }
    void display()
    {
        System.out.println("CUSTOMER NAME : "+customername);
```

```

System.out.println("ACCOUNT NUMBER : "+Account_Number);
System.out.println("ACCOUNT TYPE : "+Account_Type);

}

}
class curr_acct extends Bank{

int updated_balance;
int After_cwithdrawn;
int updated_lost_cbalance;

int cdepo_ba(){

updated_balance=Balance+deposit_balance;
return updated_balance;
}
int cwith_ba(){
After_cwithdrawn=((updated_balance)-(wthdraw_balance));
return After_cwithdrawn;
}
int minimum()
{
if((After_cwithdrawn)<=(2000))
{
updated_lost_cbalance=((After_cwithdrawn)-(200));
System.out.println("you have minimum balance below 2000 so u have lost 200 rs");

return updated_lost_cbalance;

}

else
return After_cwithdrawn;

}

}

}
class sav_acct extends Bank{

int supdated_balance;
int After_swithdrawn;

```

```

int updated_lost_sbalance;
int compound_interest;
int sdepo_ba(){

    supdated_balance=Balance+deposit_balance;
    return supdated_balance;
}
int interest()
{
    double r=0.08;
    int n=12;
    int t=5;
    compound_interest=(int)((supdated_balance)*(Math.pow((1+(r/n)),(n*t))));
    return compound_interest;
}

int Swith_ba(){
    After_swithdrawn=((compound_interest)-(wthdraw_balance));
    return After_swithdrawn;
}

int minimum()
{
    if((After_swithdrawn)<=(1000))
    {
        updated_lost_sbalance=((After_swithdrawn)-(100));
        return updated_lost_sbalance;

    }

    else
    return After_swithdrawn;
}
}

class Transactions{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        curr_acct CA=new curr_acct();
        CA.accept();
        System.out.println("Enter the money u want to deposit in current account in rupees");
        CA.deposit_balance=r.nextInt();
        CA.display();
    }
}

```

```

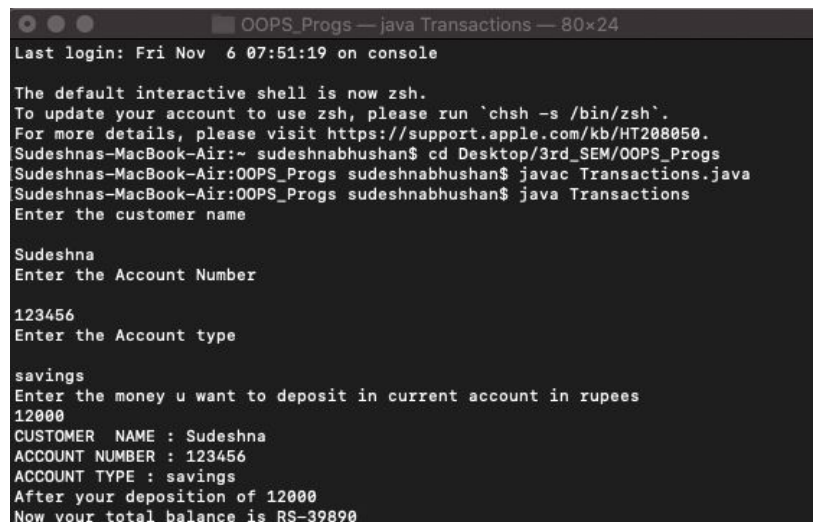
System.out.println("After your deposition of "+CA.deposit_balance+"\nNow your total balance is
RS-"+CA.cdepo_ba());
System.out.println("Enter the money you want to withdraw in rupees");
CA.wthdraw_balance=r.nextInt();
System.out.println("After your withdrawal of "+CA.wthdraw_balance+"\nNow your total balance
is RS-"+CA.cwith_ba());
System.out.println("After checking if u have minimum balance are not your updated total
balance is RS-"+CA.minimum());
sav_acct SA=new sav_acct();
SA.accept();
System.out.println("Enter the money u want to deposit in Saving account");
SA.deposit_balance=r.nextInt();
SA.display();
System.out.println("After your deposition of "+SA.deposit_balance+"\nNow your total balance is
RS-"+SA.sdepo_ba());
System.out.println("After interest ur updated balance is RS-"+SA.interest());
System.out.println("Enter the money you want to withdraw in Saving account");
SA.wthdraw_balance=r.nextInt();
System.out.println("After your withdrawal of RS-"+SA.wthdraw_balance+"\nNow your total
balance is RS-"+SA.Swith_ba());

System.out.println("After checking if u have minimum balance are not your updated total
balance is RS-"+SA.minimum());

}
}

```

OUTPUT



```

OOPS_Progs — java Transactions — 80x24
Last login: Fri Nov  6 07:51:19 on console

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac Transactions.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java Transactions
Enter the customer name

Sudeshna
Enter the Account Number

123456
Enter the Account type

savings
Enter the money u want to deposit in current account in rupees
12000
CUSTOMER NAME : Sudeshna
ACCOUNT NUMBER : 123456
ACCOUNT TYPE : savings
After your deposition of 12000
Now your total balance is RS-39890

```



```
OOPS_Progs — java Transactions — 80x24
CUSTOMER  NAME : Sudeshna
ACCOUNT NUMBER : 123456
ACCOUNT TYPE : savings
After your deposition of 12000
Now your total balance is RS-39890
Enter the money you want to withdraw in rupees
1300
After your withdrawal of 1300
Now your total balance is RS-38590
After checking if u have minimum balance are not your updated total balance is R
S-38590
Enter the customer name

SUDESHNA
Enter the Account Number

123456
Enter the Account type

current
Enter the money u want to deposit in Saving account
230
CUSTOMER  NAME : SUDESHNA
ACCOUNT NUMBER : 123456
```

LAB PROGRAM 6

QUESTION

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.

SOLUTION

[Internals.java](#)

```

package CIE;
import java.util.Scanner;
public class Internals extends CIE.Student
{
    public int ciem[]=new int[5];
    Scanner xx =new Scanner (System.in);
    public void accept()
    {
        for(int i=0;i<5;i++)
        {
            System.out.println("Enter the cie marks of subject"+(i+1)+" out of 50");
            {
                ciem[i]=xx.nextInt();
            }
        }
    }
}

```

Externals.java

```

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

public class Externals extends CIE.Student
{
    public int seem[]=new int[5];
    Scanner xx =new Scanner (System.in);
    public void accept()
    {
        for(int i=0;i<5;i++)
        {
            System.out.println("Enter the see marks of subject"+(i+1)+" out of 100");

```

```

        {
            seem[i]=xx.nextInt();
        }
    }
}

```

Student.java

```

package CIE;
import java.util.Scanner;

public class Student
{
    String name,usn;
    int sem;
    Scanner xx=new Scanner(System.in);
    public void accept()
    {
        System.out.println("Enter name:");
        name=xx.nextLine();
        System.out.println("Enter usn:");
        usn=xx.next();
        System.out.println("Enter sem:");
        sem=xx.nextInt();
    }
    public void display()
    {
        System.out.println("Name :"+name);
        System.out.println("Usn :"+usn);
        System.out.println("Sem :"+sem);
    }
}

```

TotalMarks.java

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

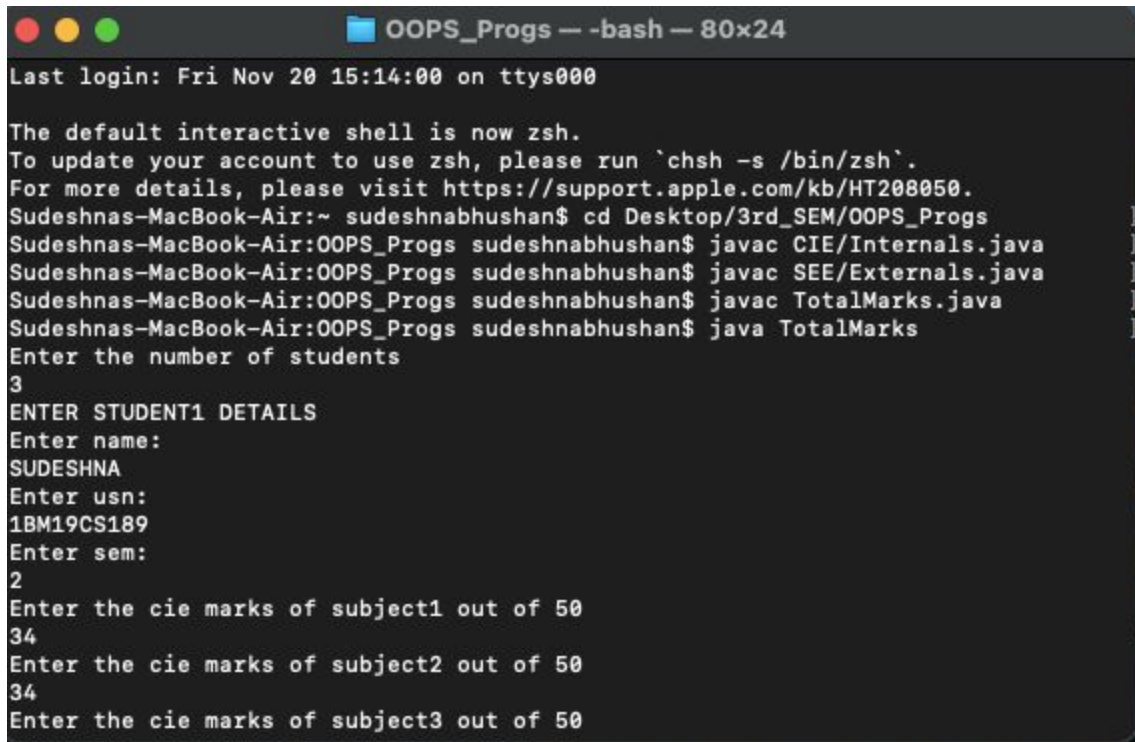
class TotalMarks
{
    public static void main(String sss[])
    {
        int i,j,n;
        int total[]=new int[5];
        Scanner xx=new Scanner(System.in);
        System.out.println("Enter the number of students");
        n=xx.nextInt();
        CIE.Student s[]=new CIE.Student[n];
        CIE.Internals ci[]= new CIE.Internals[n];
        SEE.Externals se[]=new SEE.Externals[n];
        for(i=0;i<n;i++)
        {
            System.out.println("ENTER STUDENT"+(i+1)+" DETAILS");
            s[i]=new CIE.Student();
            s[i].accept();
            ci[i]=new CIE.Internals();
            ci[i].accept();
            se[i]=new SEE.Externals();
            se[i].accept();
        }
        for(i=0;i<n;i++)
        {
            System.out.println("DETAILS OF STUDENT "+(i+1));
            s[i].display();
            for(j=0;j<5;j++)
```

```

    {
        total[j]=ci[i].ciem[j]+(se[i].seem[j]/2);
        System.out.println("Total marks in subject"+(j+1)+" is "+total[j]);
    }
}
}

```

OUTPUT



```

OOPS_Progs --bash-- 80x24
Last login: Fri Nov 20 15:14:00 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac CIE/Internals.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac SEE/Externals.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac TotalMarks.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java TotalMarks
Enter the number of students
3
ENTER STUDENT1 DETAILS
Enter name:
SUDESHNA
Enter usn:
1BM19CS189
Enter sem:
2
Enter the cie marks of subject1 out of 50
34
Enter the cie marks of subject2 out of 50
34
Enter the cie marks of subject3 out of 50

```

OOPS_Progs — -bash — 80x24

```
2
Enter the cie marks of subject1 out of 50
34
Enter the cie marks of subject2 out of 50
34
Enter the cie marks of subject3 out of 50
34
Enter the cie marks of subject4 out of 50
34
Enter the cie marks of subject5 out of 50
34
Enter the see marks of subject1 out of 100
77
Enter the see marks of subject2 out of 100
77
Enter the see marks of subject3 out of 100
77
Enter the see marks of subject4 out of 100
77
Enter the see marks of subject5 out of 100
77
ENTER STUDENT2 DETAILS
Enter name:
SUD
```

OOPS_Progs — -bash — 80x24

```
ENTER STUDENT2 DETAILS
Enter name:
SUD
Enter usn:
1BM19CS197
Enter sem:
3
Enter the cie marks of subject1 out of 50
22
Enter the cie marks of subject2 out of 50
22
Enter the cie marks of subject3 out of 50
22
Enter the cie marks of subject4 out of 50
22
Enter the cie marks of subject5 out of 50
22
Enter the see marks of subject1 out of 100
99
Enter the see marks of subject2 out of 100
99
Enter the see marks of subject3 out of 100
99
Enter the see marks of subject4 out of 100
```

```
OOPS_Progs — -bash — 80x24

99
Enter the see marks of subject2 out of 100
99
Enter the see marks of subject3 out of 100
99
Enter the see marks of subject4 out of 100
99
Enter the see marks of subject5 out of 100
99
ENTER STUDENT3 DETAILS
Enter name:
BHU
Enter usn:
1BM19CS567
Enter sem:
4
Enter the cie marks of subject1 out of 50
33
Enter the cie marks of subject2 out of 50
33
Enter the cie marks of subject3 out of 50
33
Enter the cie marks of subject4 out of 50
33
```

```
OOPS_Progs — -bash — 80x24

4
Enter the cie marks of subject1 out of 50
33
Enter the cie marks of subject2 out of 50
33
Enter the cie marks of subject3 out of 50
33
Enter the cie marks of subject4 out of 50
33
Enter the cie marks of subject5 out of 50
33
Enter the see marks of subject1 out of 100
66
Enter the see marks of subject2 out of 100
66
Enter the see marks of subject3 out of 100
66
Enter the see marks of subject4 out of 100
66
Enter the see marks of subject5 out of 100
66
DETAILS OF STUDENT 1
Name :SUDESHNA
Usn :1BM19CS189
```

```
OOPS_Progs — -bash — 80x24

DETAILS OF STUDENT 1
Name :SUDESHNA
Usn :1BM19CS189
Sem :2
Total marks in subject1 is 72
Total marks in subject2 is 72
Total marks in subject3 is 72
Total marks in subject4 is 72
Total marks in subject5 is 72
DETAILS OF STUDENT 2
Name :SUD
Usn :1BM19CS197
Sem :3
Total marks in subject1 is 71
Total marks in subject2 is 71
Total marks in subject3 is 71
Total marks in subject4 is 71
Total marks in subject5 is 71
DETAILS OF STUDENT 3
Name :BHU
Usn :1BM19CS567
Sem :4
Total marks in subject1 is 66
Total marks in subject2 is 66
```

LAB PROGRAM 7

QUESTION

Write a program to demonstrate generics with multiple object parameters.

SOLUTION

```
class GENERICSC<F,S>
{
    F object1;
    S object2;

    GENERICSC(F O1,S O2)
    {
        object1=O1;
```



```

object2=O2;
}
void printname()
{
System.out.println("Type of object 1 is "+object1.getClass().getName());
System.out.println("Type of object 2 is "+object2.getClass().getName());
}
F getob1()
{
return object1;
}
S getob2()
{
return object2;
}
}
public class DGenerics
{
public static void main(String args[])
{
GENERICSC<Float,String> G1=new GENERICSC<Float,String>(10f,"CGPA");
G1.printname();
float FL=G1.getob1();
System.out.println("The number given to object 1 is"+FL);
String ST=G1.getob2();
System.out.println("The detail given to object 2 is"+ST);
}
}

```

OUTPUT

```
OOPS_Progs — -bash — 80x24
Last login: Fri Nov 20 17:55:52 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac DGenerics.java
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java DGenerics
Type of object 1 is java.lang.Float
Type of object 2 is java.lang.String
The number given to object 1 is 10.0
The detail given to object 2 is CGPA
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$
```

LAB PROGRAM 8

QUESTION

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<0. In Son class, implement a constructor that takes both father and son’s age and throws an exception if son’s age is >=father’s age.

SOLUTION

```
import java.util.*;
```

```

class WrongAge extends Exception
{
    private int a1,b1;
    WrongAge(int a,int b)
    {
        a1=a;
        b1=b;
    }
    public String toString()
    {
        if(a1<0||b1<0)
            return "input age cannot be less than 0";
        else if(a1<=b1)
            return "father age cannot be less than or equal to son age ";
        return "";
    }
}

```

```

class Father
{
    int fage,sage;
    Scanner sc=new Scanner(System.in);
    Father() throws WrongAge
    {
        System.out.println("enter the age of father");
        fage=sc.nextInt();
        System.out.println("enter the age of son");
        sage=sc.nextInt();
        if(fage<0||sage<0)
            throw new WrongAge(fage,sage);
    }
}

```

```

class Son extends Father
{
    Son() throws WrongAge
    {
        if(sage>=fage)
            throw new WrongAge(fage,sage);
    }
}

```

```

        else
            System.out.println("proper ages have been entered");
    }
}

class Main2
{
    public static void main(String args[])
    {
        try
        {
            Son s=new Son();
        }catch(WrongAge e){
            System.out.println("error:"+e);
        }
    }
}

```

OUTPUT

```

Last login: Fri Dec 11 15:05:31 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
[Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
[Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac Main2.java
[Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java Main2
enter the age of father
77
enter the age of son
2
proper ages have been entered
[Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java Main2
enter the age of father
2
enter the age of son
99
error:father age cannot be less than or equal to son age
Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$

```

LAB PROGRAM 9

QUESTION

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.

SOLUTION

```
class NewThread implements Runnable
{ Thread t;
  NewThread()
  {
    t = new Thread(this, "NThread");
    t.start();
  }

  public void run()
  {
    try
    {
      for(int n=100;n>0;n--)
      {
        System.out.println("CSE");
        Thread.sleep(2000);
      }
    }
    catch(InterruptedException ie)
    {
      System.out.println("Child Thread Interrupted");
    }
  }
}

class Week11Lab
{
  public static void main(String ss[])
  {
```

```

        NewThread n1=new NewThread();
        //n1.t.start();

        try
        {
            for(int n=5;n>0;n--)
            {
                System.out.println("BMS College of Engineering");
                Thread.sleep(10000);
            }
        }
        catch(InterruptedException ie)
        {
            System.out.println("Main Thread interrupted");
        }
    }
}

```

OUTPUT

```

Last login: Thu Dec  3 14:11:06 on ttys000

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
[Sudeshnas-MacBook-Air:~ sudeshnabhushan$ cd Desktop/3rd_SEM/OOPS_Progs
[Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ javac Week11Lab.java
[Sudeshnas-MacBook-Air:OOPS_Progs sudeshnabhushan$ java Week11Lab
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE

```

LAB PROGRAM 10

QUESTION

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.

SOLUTION

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

public class Lab10 extends Frame implements ActionListener{
    TextField t1,t2;
    String msg="";
    Button btn;
    Lab10(){
        Label l1 = new Label("First Number: ",Label.RIGHT);
        t1 = new TextField(10);
        Label l2 = new Label("Second Number: ",Label.RIGHT);

        t2 = new TextField(10);
        btn = new Button("Submit");
        //Label l = new Label("Updates:");
        l1.setBackground(Color.YELLOW);
        l2.setBackground(Color.YELLOW);
        //this.setResizable(false);
        this.add(l1);
        this.add(t1);
        this.add(l2);
        this.add(t2);
```

user

//the following command will make sure that the input char is not visible to the

user
//(it has been added just to demonstrate). Can be used for passwords.

```
//t1.setEchoChar('*');
```

```
//t2.setEchoChar('#');
```

```
this.add(btn, BorderLayout.CENTER);
```

```
this.setVisible(true);
```

```
this.setSize(600, 300);
```

```
this.setLayout(new FlowLayout(FlowLayout.CENTER,20,10));
```

```
//t1.addActionListener(this);
```

```
btn.addActionListener(this);
```

```
addWindowListener(new MyWindow());
```

```
setBackground(Color.YELLOW);
```

```
//System.out.println(BorderLayout.CENTER);
```

```
}
```

```
@Override
```

```
public Insets getInsets() {
```

```
    return new Insets(50,10,10,20);
```

```
}
```

```
@Override
```

```
public void actionPerformed(ActionEvent e) {
```

```
    String st1 = t1.getText();
```

```
    String st2 = t2.getText();
```

```
    double n1,n2;
```

```
    n1 = 0.0;
```

```
    n2 = 0.0;
```

```
    if(st1.equals("")||st2.equals("")) {
```

```
        msg="You cannot leave the text elements blank";
```

```
    }else{
```

```
        try {
```

```
            n1 = Double.parseDouble(st1);
```

```
            n2 = Double.parseDouble(st2);
```

```
            try {
```

```
                double res = n1/n2;
```

```
                msg = "Result of division: "+res;
```

```
            }catch(ArithmeticException e1) {
```

```
                msg = e1.toString();
```

```
            }
```

```
        }catch(NumberFormatException e2) {
```

```
            msg = "Enter only numbers and not other things";
```



```

        }
    }
    new MyDialog(this,"Result Dialog",false,msg,n1,n2);
}
public static void main(String[] args) {
    new Lab10();
}
}

```

class MyDialog extends Dialog implements ActionListener{

```

    public MyDialog(Frame owner, String title, boolean modal,String msg, double n1, double
n2) {

```

```

        super(owner, title, modal);
        this.setVisible(true);
        this.setSize(300, 400);
        this.setLayout(new FlowLayout());
        //System.out.println(owner);
        Label l1 = new Label("        Updates on the result:        ");
        //l1.setSize(300, 20);
        this.add(l1);
        this.add(new Label("First Number: "+n1));
        this.add(new Label("Second Number: "+n2));
        this.add(new Label(msg));

```

```

        Button b = new Button("Close");
        this.add(b);
        b.addActionListener(this);
        this.addWindowListener(new WindowAdapter() {
            public void windowClosing(WindowEvent e) {
                dispose();
            }
        });
    }
}

```

```

@Override
public void actionPerformed(ActionEvent e) {
    dispose();
}

```

```

}

```

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

OUTPUT

First Number: 12 Second Number: 0

Submit

Result Dialog

Updates on the result:

First Number: 12.0 Second Number: 0.0

Result of division: Infinity

Close

Result Dialog

Updates on the result:

First Number: 12.0 Second Number: 17.0

Result of division: 0.7058823529411765

Close



