

OOJ Lab Programs

Lab - 1 program

develop a java program that prints all real soln to quadratic equation $ax^2 + bx + c = 0$. Read a, b & c. if the discriminant $b^2 - 4ac$ is -ve, display message stating No - real solns.

Code -

```

import java.util.*;
import java.lang.*;
public class quadratic
{
    public static void main (String args [])
    {
        double a, b, c, r1 = 0, r2 = 0;
        System.out.println ("Enter coefficients of a, b & c
                           for the Quadratic equation:");
        Scanner in = new Scanner (System.in);
        a = in.nextDouble();
        b = in.nextDouble();
        c = in.nextDouble();
        double d = (b * b) - (4 * a * c);
        if (d == 0)
        {
            System.out.println ("two equal & real roots");
            r1 = -b / 2 * a;
            r2 = r1;
        }
        else if (d > 0)
            System.out.println ("two distinct real roots");
            r1 = -b + Math.sqrt(d) / 2 * a;
    }
}

```

```
r2 = -b - Math.sqrt(d)/2*a;  
}  
else  
{
```

```
System.out.print("No real roots");  
System.exit(0);  
}
```

```
System.out.println("Roots of Quadratic equation  
are r1 = "+r1+" & r2 = "+r2);  
}
```

{

— — — X — —

Lab 2 - program

develop a java program to create a class
Student - with members like, vsn, name
an Array of credits.
an Array of Marks.

Also,

Include Methods to Accept & Display.
Also a Method to calculate SGPA of the
Student.

Display All the details.

CommandLine Arguments

JDK 11.0.4



Interactive



Execute



Result

compiled and executed in 22.496 sec(s)

Enter coefficients a,b and c of quadratic equation:

3

4

1

Two distinct real roots

Roots of quadratic equation are r1 = -1.0 and r2 = -7.0



```
r2 = -b - Math.sqrt(d)/2*a;
```

```
} else
```

```
{
```

```
System.out.print("No real roots");
```

```
System.exit(0);
```

```
}
```

```
System.out.println("Roots of Quadratic equation  
are r1 = "+r1+" & r2 = "+r2);
```

```
{
```

```
}
```

→ X →

Lab 2 - program

develop a java program to create a class Student - with members like, vsn, name
an Array of credits.
an Array of Marks.

Also,

include Methods to Accept & Display.
Also a Method to calculate SGPA of the
Student.

Display All the details.

```
import java.util.*;
public class student
{
    String usn, name;
    static int credits[];
    static double marks[];
    void input (int n)
    {
        Scanner sc = new Scanner (System.in);
        System.out.println ("enter usn & name");
        usn = sc.nextInt();
        name = sc.nextLine();
        System.out.println ("enter marks along with credits");
        for (int i=0; i<n; i++)
        {
            marks[i] = sc.nextDouble();
            credits[i] = sc.nextInt();
        }
        System.out.println ();
        double calculate (int n)
        {
            int c, cred = 0;
            double tot, total = 0.0;
            for (int i=0; i<n; i++)
            {
                tot = marks[i];
                if (tot >= 90)
                    c = 10;
                else if (tot >= 80)
                    c = 9;
                else if (tot >= 70)
```

```

C = 8;
else if (tot >= 60)
    C = 7;
else if (tot >= 50)
    C = 6;
else if (tot >= 40)
    C = 4;
else
    C = 0;
total = total + (c * credits[i]);
cred = cred + credits[i];
}
total = total / cred;
return (total);
}

void display (int n, double total)
{
    System.out.println ("name of student : " + name);
    System.out.println ("USN of Student : " + USN);
    System.out.println ("marks of student along with credits");
    for (int i = 0; i < n; i++)
    {
        System.out.println (marks[i] + " " + credits[i]);
    }
    System.out.println ("SGPA of student : " + total);
}

public static void main (String args[])
{
    Scanner sc = new Scanner (System.in);
    Student obj = new Student ();
    System.out.println ("enter no of course");
    int n = sc.nextInt ();
    Credits = new int [n];
    marks = new double [n];
    double total = obj.calculate (n);
    obj.display (n, total);
}

```

enter no of course

5

enter usn and name

1BM19CS122

prithvi j

enter marks along with credits

90

2

88

2

95

1

96

2

88

3

name of student : prithvi j

usn of student : 1BM19CS122

marks of student along with credits of course

90.0 2

88.0 2

95.0 1

96.0 2

88.0 3

sgpa of student : 9.5

Lab Program- 3

Create a class Book, which contains 4 members:

name

Author

Price

num pages

Include a constructor to set the values for the Members. Also include a method to set & get the details of the Objects.

Include a to String () Method that could display the complete details of the book

Develop a program to create 12 Book Objects.

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

```
class book
```

```
{
```

```
String booktitle ;
```

```
String author ;
```

```
int no_of_pages ;
```

```
double price ;
```

```
Scanner sc = new Scanner (System.in);
```

```
book ()
```

```
{
```

```
booktitle = " " ;
```

```
author = " " ;
```

```
no_of_pages = 0 ;
```

```
price = 0 ;
```

```
{
```

```
void get details()
```

```
{
```

```
System.out.print ("enter the book title :");
```

```
booktitle = sc.nextLine();
```

```
System.out.print (" enter author name :");
```

```
author = sc.nextLine();
```

```
System.out.print ("enter the price of book :");
```

```
price = sc.nextDouble();
```

```
System.out.print (" enter no of pages :");
```

```
no_of_pages = sc.nextInt();
```

```
{
```

```
public String toString()
```

```
{
```

```
return ("book name =" + booktitle + "author =" +  
author + "price =" + price + "pages =" + no_of_pages);
```

{

{

public class Books

{

public static void main (String [] args)

{

int a, i;

{

Scanner in = new Scanner (System.in);

a = in.nextInt();

{

book [] b = new book [a];

{

for (i=0; i<a; i++)

{

System.out.println ("enter details of book " + (i+1));

b [i] = new book ();

b [i].getdetails ();

{

for (i=0; i<a; i++)

{

System.out.println (b [i]);

{

{

{

enter number of books:1
enter details of book1
enter the book title:Harry Potter and the goblet of fire
enter author name:JK Rowling
enter the price of book :1800
enter the number of pages:670
book name=Harry Potter and the goblet of fire author=JK Rowling price=1800.0 pages =670

Lab Program - 4

develop a java program to create an Abstract class named Shape that contains 2 Integers & an empty Method named print Area(). provide 3 classes named rectangle, triangle & circle such that each one of the classes extends the class shape. each one of the classes contain only the Method print Area() - that prints Area of the shape.

Code - Abstract class Shape

{

double dim1;

double dim2;

Shape (double a, double b)

{

dim1 = a;

dim2 = b;

}

abstract double area();

}

class Rectangle extends Shape

{

Rectangle (double a, double b)

{

Super (a, b);

}

double area();

System.out.println ("Inside Area for rectangle : ");

return dim1 * dim2;

{

}

class Triangle extends Shape

{

Triangle (double a, double b)

{

Super (a, b);

{

double area ()

{

System.out.println ("Inside Area for rectangle : ");
return dim1 * dim2 / 2;

{

{

class Circle extends Shape

{

Circle (double a)

{

super (a, a);

{

double area ()

{

System.out.println ("Inside area for Circle is : ");
return 3.14 * dim1 * dim2;

{

{

public class AbstractArea

{

public static void main (String args [])

{

Rectangle r = new Rectangle (9, 5);

Triangle t = new Triangle (10, 8);

Circle c = new Circle (7);

Shape f = r;

System.out.println("Area is :" + shape f.area());
 Shape f = t;

System.out.println("Area is :" + shape f.area());
 Shape f = c;

System.out.println("Area is :" + shape f.area());
 g
 g

————— X —————

Lab Program - 5

develop a java pgm to create a class called Bank. that has 2 kinds of accounts - savings n current Account. The Savings Account - provides comp interest & withdrawal facilities but no cheque book. The Current Account provides cheque book but no interest. - they should also maintain a min. balance - if it falls, a service charge is imposed. Create a class that stores Account number, Name & type of Account. then derive classes curr-acct & sav-acct to make them more specific to their requirements. Accept the deposit from customer & update the balance. display - Balance & Comp interest. Permit withdrawal & check for min balance & impose fine if necessary.

Code -

```
import java.util.*;  

class account
```

{

String cus_name;

int acc_num;

String acc_type;

account(String cus_name, int acc_num, String acc_type)

{

Mr Result

```
$javac AbstractAreas.java
```

```
$java -Xmx128M -Xms16M AbstractAreas
```

inside area for rectangle:

Area is:45.0

inside area for triangle:

Area is:40.0

inside area for circle:

Area is:153.86

```
System.out.println("Area is :" + shape_f.area());
shape_f = t;
```

```
System.out.println("Area is :" + shape_f.area());
shape_f = c;
```

```
System.out.println("Area is :" + shape_f.area());
}
}
```

————— X —————

Lab Program - 5

develop a java pgm to create a class called Bank that has 2 kinds of accounts - savings n current Account. The Savings Account - provides comp. interest & withdrawal facilities but no cheque book. The Current Account provides cheque book but no interest. - they should also maintain a min. balance - & if it falls, a service charge is imposed. Create a class that stores Account number, Name & type of Account. then derive classes curr-acct & sav-acct to make them more specific to their requirements. Accept the deposit from customer & update the balance. display - balance & compute interest. Permit withdrawal & check for min balance & impose fine if necessary.

Code - import java.util.*;

class account

{

String cus_name;

int acc_num;

String acc_type;

account(String cus_name, int acc_num, String acc_type)

{

```

    this.cus_name = cus_name;
    this.acc_name = acc_num;
    this.acc_type = acc_type;
}

```

```

void display()
{
    System.out.println("details of the customer are : \n"
        + cus_name + acc_num + acc_type);
}

```

```

class curr_acct extends account
{
    int amt; int balance;
}
curr_acct (String cus_name, int acc_num, String acc_type)
{
    super(cus_name, acc_num, acc_type);
}

```

```

void display()
{
    Scanner in = new Scanner(System.in);
    System.out.println("Checkbook facility Available");
    System.out.println("enter Initial Amount : ");
    balance = in.nextInt();
    System.out.println("press 1 for withdrawl \n press 2
for deposit");
    int choice = in.nextInt();
}

```

```

if (choice == 1)
{
    System.out.println("enter Amt to be withdrawn : ");
    amt = in.nextInt();
}

```

```

System.out.println("Withdrawl of amount "+amt+" was
successful");

```

```

balance = balance - amt;

```

```

System.out.println("Remaining balance :" + balance);
}

```

```

else if (choice == 2)
{
}

```

```
System.out.println("enter the Amount to be Added:");
amt = in.nextInt();
```

```
System.out.println("Amount "+amt+" added Successfully");
balance = balance + amt;
```

```
System.out.println("Remaining balance : "+balance);
```

```
if (balance < 1000)
```

```
{ balance = balance - 100;
```

```
System.out.println("Service charge of Rs.100 is Imposed
in Remaining balance : "+balance);
```

```
}
```

```
}
```

```
}
```

```
class SavAcct extends Account
```

```
{ int amt, balance;
```

```
savAcct (String cus_name, int acc_num, String acc_type)
{ super (cus_name, acc_num, acc_type);
}
```

```
void display()
```

```
Scanner in = new Scanner (System.in);
```

```
System.out.println("Check book facility not Available");
```

```
System.out.println("enter initial Amnt : ");
```

```
balance = in.nextInt();
```

```
System.out.println("press 1 - withdrawal \n 2 - Deposit");
```

```
int choice = in.nextInt();
```

```
if (choice == 1)
```

```
System.out.println("enter Amnt. to be withdrawal : ");
```

```
amt = in.nextInt();
```

```
System.out.println("withdrawal of Amnt " + amt + " was
Successful");
```

```
balance = balance - amt;
System.out.println("Remaining balance : " + balance);
}
else if (choice == 2)
{
    System.out.println("Enter Amt to be added : ");
    amt = in.nextInt();
    System.out.println("Amt " + amt + " added successfully.");
    balance = balance + amt;
    System.out.println("Remaining balance : " + balance);
}
if (balance < 1000)
{
    balance = balance - 100;
    System.out.println("Service charge of Rs. 100 is imposed
        on Remaining balance : " + balance);
}
double interest = (balance * 1 * 5) / 100;
System.out.println("Interest for 1 year is : " + interest);
}

public class lab4 {
    public static void main (String args [ ] )
    {
        Scanner in = new Scanner (System.in);
        for ( ; ; )
        {
            System.out.println("Enter customer name : ");
            String name = in.nextLine();
            System.out.println("Enter Account type : ");
            String type = in.nextLine();
        }
    }
}
```

```
System.out.println ("Enter Account Number :");  
int num = in.nextInt();  
account acc = new account (name, num, type);  
curr_acct curr = new curr_acct (name, num, type);  
Sav_acct sav = new sav_acct (name, num, type);  
account ac;  
acc.display ();  
if (type.equals ("current"))  
{  
    ac = curr;  
    ac.display ();  
}  
else if (type.equals ("savings"))  
{  
    ac = sav;  
    ac.display ();  
}  
}  
}  
}  
}  
}
```

— X —

Result

compiled and executed in 120.611 sec(s)

Enter customer name:

prithvi

Enter the account type:

savings

Enter account number:

2136786

Details of the customer are:

prithvi2136786savings

Checkbook facility not available

Enter initial amount:

8000

press 1 for withdrawal

 press 2 for deposit

1

Enter the amount to be withdrawn:

1000

withdrawal of amount 1000 was successful

Remaining balance: 79000

The interest for 1 year is: 3950.0