

## LAB-1

Write a program to calculate roots of a quadratic equation  $(ax^2 + bx + c)$

```
import java.util.*;  
import java.lang.Math;  
class Solutions  
{  
    public static void main(String args[])  
    {  
        Scanner input = new Scanner(System.in);  
        float a, b, c;  
        System.out.println("Enter the three coefficients  
of your quadratic equation");  
        a = input.nextFloat();  
        b = input.nextFloat();  
        c = input.nextFloat();  
        float d, sol1, sol2;  
        d = b * b - 4 * a * c;  
        if (d < 0)  
            System.out.println("No Real solutions");  
        else  
        {  
            sol1 = (float) (-b + Math.sqrt(d)) / (2 * a);  
            sol2 = (float) (-b - Math.sqrt(d)) / (2 * a);  
            System.out.println("Solution1: " + sol1);  
            System.out.println("Solution2: " + sol2);  
        }  
    }  
}
```



# ALGORITHM:

Step 1: ~~Input~~ INPUT  $a, b, c$

Step 2:  $d = b * b - 4 * a * c$

Step 3: If  $(d < 0)$   
~~Print~~ PRINT No real ~~solutions~~ solutions.

ELSE

PRINT Solution 1 =  $(-b + \sqrt{d}) / 2 * a$

PRINT Solution 2 =  $(-b - \sqrt{d}) / 2 * a$

Step 4: STOP



# ALGORITHM

Step 1: START

Step 2: READ usn, name, credits[], marks[]

Step 3: grade() func.

```
if (marks >= 90 & marks <= 100) return 10;  
else if (marks >= 80 & marks < 90) return 9;  
else if (marks >= 70 & marks < 80) return 8;  
else if (marks >= 60 & marks < 70) return 7;  
else if (marks >= 50 & marks < 60) return 6;  
else if (marks >= 40 & marks < 50) return 5;  
else  
    print fail  
    return 0
```

Step 4: calculate gpa() func

```
initialise i = 0, till i < 5    i++  
sum of credits += credits[i]  
total sum of marks t += grade * credits[i]  
  
return sum / sum - credits;
```

Step 5: Print gpa

Step 6: end.



## LAB - 2

Program to calculate sgpa of student

```
import java.util.*;

class student
{
    public static String usr;
    public static String name;
    public static int credits[];
    public static int marks[];
    public static void main(String args[])
    {
        System.out.println("Enter your details:");
        getgetdetails();
        System.out.println(name + " got " + calculateSgpa()
+ " sgpa");
    }
    public static void getdetails()
    {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter your USN: ");
        usr = input.next();
        System.out.print("Enter your name: ");
        name = input.next();
        credits = new int[5];
        marks = new int[5];
        for (int i = 0; i < 5; i++)
        {
            System.out.print("Enter your marks in
```



```

subject " + (i+1) + " : ";
marks[i] = input.nextInt();
system.out.print("Enter the credits of
subject " + (i+1) + " : ");
credits[i] = input.nextInt();
}
}

```

```

}
}
public static double calculateGpa()
{
    int c;
    int sum = 0, sum_credits = 0;
    for (int i = 0; i < 5; i++)
    {
        c = subjectPoints(marks[i]);
        sum_credits += credits[i];
        sum += c * credits[i];
    }
    return (double) sum / sum_credits;
}
}

```

```

public static int subjectPoints(int marks)
{
    if (marks >= 90 && marks < 100)
        return 10;
    else if (marks >= 80 && marks < 90)
        return 9;
    else if (marks >= 70 && marks < 80)
        return 8;
    else if (marks >= 60 && marks < 70)
        return 7;
}
}

```



```
else if (marks >= 50 & marks < 60)
    return 6;
else if (marks >= 40 & marks < 50)
    return 5;
else
{
    System.out.println("You Failed in this
Subject");
    return 0;
}
}
```



## ALGORITHM:

Step 1: start

Step 2: Read name, author, price, num-pages from constructor

Step 3: to string() method  
return ("In Author: " + author + "In Price: " + price  
+ "In Total pages: " + num-pages);

Step 4: end class Book.

Step 5: class BookDetails

take input ~~from~~ for each object for  
its instance variable

Step 6: for  $i = 0$  to  $n$   
display obj[i]

Step 7: end.



### LAB-3.

```
import java.util.*;
class Book
{
    String name;
    String author;
    double price;
    int num-pages;
    Book (String name, String author, double price, int
num-pages)
    {
        this.name = name;
        this.author = author;
        this.price = price;
        this.num-pages = num-pages;
    }
    public String toString()
    {
        return ("Author: " + author + "\n Price: " + price + "\n
Total pages: " + num-pages);
    }
}
class BooksDetails
{
    public static void main(String args[])
    {
        String a, b, m;
        double c; int d;
        System.out.print("How many books details
do you want to enter: ");
    }
}
```



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

```
m = input.nextInt();
```

```
Book book[] = new Book[m];
```

```
for (int i = 0; i < m; i++)
```

```
{  
    System.out.println("Enter the details of Book "  
        + (i+1) + " :");
```

```
    System.out.print("Name: ");
```

```
    a = input.nextLine();
```

```
    System.out.print("Price: ");
```

```
    c = input.nextInt();
```

```
    System.out.print("Author: ");
```

```
    b = input.next();
```

```
    System.out.print("Pages: ");
```

```
    d = input.nextInt();
```

```
    book[i] = new Book(a, b, c, d);
```

```
}
```

```
for (int i = 0; i < m; i++)
```

```
{  
    System.out.println("Details of Book " + book[i].  
        name + " :");
```

```
    System.out.println(book[i]);
```

```
}
```

```
}
```

```
}
```



Lab-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 of the class contains only the method printArea() that prints the area of the given shape.

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

```
abstract class shape  
{
```

```
    int dim1 = 1, dim2 = 2;  
    abstract void printArea();  
}
```

```
class Rectangle extends shape  
{
```

```
    void printArea()  
    {
```

```
        double area = dim1 * dim2;  
        System.out.println("Rectangle's area is : "  
                             + area);  
    }
```

```
class Triangle extends shape  
{
```

```
    void printArea()  
    {
```

```
        double area = dim1 * dim2 * 0.5;  
        System.out.println("Triangle's area is : "  
                             + area);  
    }
```



```
class Circle extends Shape
```

```
{
```

```
    void printarea()
```

```
{
```

```
        double area = 3.1415 * dim1 * dim1;
```

```
        System.out.println("Circle's area is : " +
```

```
area);
```

```
    }
```

```
}
```

```
class Series
```

```
{
```

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

```
{
```

```
        Rectangle r = new Rectangle();
```

```
        r.printarea();
```

```
        Triangle t = new Triangle();
```

```
        t.printarea();
```

```
        Circle c = new Circle();
```

```
        c.printarea();
```

```
    }
```

```
}
```



Lab-5.

Bank program.

```
import java.io.*;  
import java.lang.*;  
import java.util.*;  
abstract class account.  
{
```

```
    String name;  
    String acc-no;  
    String type;  
    double balance;  
    account (String n, String a, String t, double b)  
    {
```

```
        name = n;  
        acc-no = a;  
        type = t;  
        balance = b;  
    }
```

```
    abstract void deposit();  
    abstract void display();  
    abstract void withdraw();  
    abstract void find();  
    abstract void inter();  
}
```

```
class curr-acc extends account  
{
```

```
    curr-acc (String n, String a, String t, double b)  
    {  
        deposit (n, a, t, b);  
    }  
}
```



```

void fine()
{
    if (balance < 1000)
    {
        system.out.println("You'll be Fined 500Rs  

        Because Minimum balance in your account must be 1000");
        balance = balance - 500;
        display();
    }
    else
    {
        system.out.println("You will not be charged  

        any fine Thank you");
        display();
    }
}

```

```

void display()
{
    system.out.println("Name of the Account Holder  

    is " + name);
    system.out.println("Account number of the  

    Account Holder is " + acc_no);
    system.out.println("Type of the account of  

    the Account Holder is " + type);
    system.out.println("Balance in your account  

    is " + balance);
}

void deposit()
{

```



```

double sum;
Scanner sc = new Scanner(System.in);
System.out.println("Enter the amount you want
To Deposit");
sum = sc.nextDouble();
balance += sum;
display();
}

```

```

void withdraw()
{

```

```

double sum;
Scanner sc = new Scanner(System.in);
System.out.println("Enter the amount you
want to Withdraw");
sum = sc.nextDouble();
balance -= sum;
if (balance > 1000)
    display();
else
{

```

```

    System.out.println("You cannot Withdraw
This much Amount");
}

```

```

void inter()
{

```

```

    System.out.println("Your Account Type is
not Eligible For any Interest");
}

```

```

}

```



```

class sav_acc extends account
{
    sav_acc(String n, String a, String t, double b)
    {
        super(n, a, t, b);
    }
    void display()
    {
        System.out.println("Name of the Account Holder is " + name + "\n");
        System.out.println("Account Number of the Account Holder is " + acc-no + "\n");
        System.out.println("Type of the Account of the Account Holder is " + type + "\n");
        System.out.println("Balance in your Account is " + the balance + "\n");
    }
    void withdraw()
    {
        double sum;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the amount you want to withdraw");
        sum = sc.nextDouble();
        balance -= sum;
        display();
    }
    void deposit()
    {

```



```

int sum;
Scanner sc = new Scanner(System.in);
System.out.println("Enter the principle amount  
you want to submit");
sum = sc.nextInt();
balance += sum;
display();
}

```

```

void inter()
{
    double r, t, interest, amount, power;
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the Rate of interest");
    r = sc.nextDouble();
    System.out.println("Enter the year of time  
Account has to be elapsed");
    t = sc.nextDouble();
    power = Math.pow((1 + (r) / (100)), t);
    System.out.println(power);
    amount = balance * power;
    System.out.println(amount);
    interest = amount - balance;
    System.out.println("Interest Accumulated  
In your Account is " + interest);
    display();
}

```

```

void fin()
{
    System.out.println("You have no restriction on your  
min. balance. Thank You Sir");
}
}

```



```
class Bank  
{
```

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

```
    {  
        account a;
```

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

```
        String name, acc-num, typ;
```

```
        int option;
```

```
        double bal;
```

```
        System.out.println("Enter the name of the  
account holder");
```

```
        name = sc.next();
```

```
        System.out.println("Enter the Account Number");
```

```
        acc-num = sc.next();
```

```
        typ = "Current Account";
```

```
        System.out.println("Enter the min-balance  
in the account");
```

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

```
        System.out.println("1: Current Account");
```

```
        System.out.println("2: Savings Account");
```

```
        System.out.println("3: Exit");
```

```
        System.out.println("Enter your choice");
```

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

```
        switch(option)
```

```
        {
```

```
            case 1:
```

```
                curr-acc c = new curr-acc(name, acc-num,  
                typ, bal); a=c; int counter;
```



```
do  
{
```

```
    System.out.println("1: Check for Fine");  
    System.out.println("2: Deposit");  
    System.out.println("3: Withdraw");  
    System.out.println("4: Exit");  
    System.out.println("Enter your choice");  
    counter = sc.nextInt();  
    switch (counter)  
    {
```

```
        case 1: a.find();  
                break;
```

```
        case 2: a.deposit(); break;
```

```
        case 3: a.withdraw(); break;
```

```
        case 4: System.exit(0); break;
```

```
    }
```

```
    while (counter != 4)  
        break;
```

```
case 2:
```

```
new-acc s = new sav-acc(name, acc-number, type  
bal);
```

```
a = s;
```

```
int cnt;
```

```
do
```

```
{
```

```
    System.out.println("1: Deposit");
```

```
    System.out.println("2: Withdraw");
```

```
    System.out.println("3: Inhibit");
```

```
    System.out.println("4: Exit");
```



```
System.out.println("Enter your choice");  
switch (cns)  
{
```

```
    case 1: a.deposit(); break;  
    case 2: a.withdraw(); break;  
    case 3: a.inter();  
    case 4: System.exit(0); break;  
}
```

```
while (cns != 5), break;
```

```
    case 3:  
        System.exit(0);  
        break;
```

```
}
```

```
}
```

```
}
```