

Lab 1

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.

Quadratic

```
g)import java.util.Scanner;  
public class Main {  
    public static void main (String args []) {  
        Scanner sc = new Scanner (System.in);  
        System.out.println ("Enter the a,b,c");  
        double a = sc.nextInt ();  
        double b = sc.nextInt ();  
        double c = sc.nextInt ();  
        double delta = (b*b) - (4*a*c);  
        double root1, root2;  
        if (delta >= 0)  
        {  
            root1 = (-b - Math.sqrt (delta)) / (2*a);  
            root2 = (-b + Math.sqrt (delta)) / (2*a);  
            System.out.println ("Two real roots are : " + root1 + " , " + root2);  
        }  
        else  
        {  
            System.out.println ("No real roots");  
        }  
    }  
}
```

Administrator: Command Prompt

use --help for a list of possible options

D:\akask-java>javac quadEquation.java

D:\akask-java>java quadEquation

The equation is of the form ax^2+bx+c.

Enter the value of a,b and c respectively

2

4

5

The roots are imaginary

The imaginary roots are -4.0+i1.224744871391589 and -4.0-i1.224744871391589

D:\akask-java>

Lab 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.

Q2) SGPA

```
import java.util;
class student
{
    string usn, name;
    string int credits[];
    static double marks [];
    void student Input (int n)
    {
        scanner sc = new scanner (System.in);
        System.out.println ("Enter usn and name");
        usn = sc.nextLine ();
        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 studentDisplay (int n, double total) {
```

```
System.out.println ("Name of students : " + name);
```

classmate

```
System.out.println("usn of students :" + usn);
System.out.println ("marks of student along with credits of
courses"),;
for (int i = 0; i < n; i++)
{
    System.out.println (marks [i] + " " + credits[i]);
}
System.out.println ("sgpa of students :" + 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];
    mark = new double [n];
    obj.studentInput(n);
    double total = obj.calucte (n);
    obj.StudentDisplay (n, total);
}
```

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Directory of D:\akask-java

9-12-2020	09:25	<DIR>	.
9-12-2020	09:25	<DIR>	..
8-12-2020	09:09		4,510 Account.java
8-12-2020	08:55		1,001 AgeMain.java
5-12-2020	10:55		1,546 BookMain.java
9-12-2020	07:07		504 Division\$MyWindowAdapter.class
9-12-2020	07:07		2,304 Division.class
9-12-2020	07:07		1,625 Division.java
8-12-2020	08:57		880 Gen.java
8-12-2020	09:18		1,663 Inherit1.java
8-12-2020	09:17		2,756 PlayerInher.java
9-12-2020	09:19		1,702 quadEquation.class
9-12-2020	09:19		974 quadEquation.java
9-12-2020	08:46		1,713 SgpaMain.java
8-12-2020	09:10		987 Shape.java
9-12-2020	09:25		1,713 studentSgpa.java
7-12-2020	11:05		733 ThreadMain.java
5-12-2020	11:09		2,309 totalmarks.java
		16 File(s)	26,920 bytes
		2 Dir(s)	690,499,375,104 bytes free

D:\akask-java>javac studentSgpa.java

D:\akask-java>java studentSgpa

Enter name and usn

akash

BM18CS009

Enter marks and credits of subject 1

9 5

Enter marks and credits of subject 2

9 4

Enter marks and credits of subject 3

5

Enter marks and credits of subject 4

5

Enter marks and credits of subject 5

5

Name : akash

USN : BM18CS009

Total marks : 393.0

GPA : 8.238095238095237

D:\akask-java>



Type here to search



Lab 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.

Q3) Book.java

```
import java.util.Scanner;  
class Book;  
{  
    String name;  
    String author;  
    String price ;  
    String num_page;  
    public Book;  
{  
    name="abc";  
    author="xyz";  
    price ="100rs";  
    num_pages ="500";  
}  
void getData()  
{  
    Scanner s1 = new Scanner(System.in);  
    System.out.println("Enter Book name:");  
    name=s1.next();  
    System.out.println("Enter author name:");  
    author=s1.next();  
    System.out.println("Enter number of pages ");  
    num_pages =s1.next();  
}
```

```
public string toString()
{
    return ("Book : " + name + " \ Author : " + author + " \n Price : " + Price +
           "\n Number of pages : " + numPages);
}

public class BookMain
{
    public static void main (string args [])
    {
        int i, n;
        Book tempby = new Book();
        System.out.println ("constructor values : ");
        System.out.println (tempby.toString());
        System.out.println ("Enter number of books : ");
        Scanner s = new Scanner (System.in);
        n = s.nextInt();
        Book [ ] ob = new Book [n];
        for (i = 0; i < n; i++)
        {
            ob [i] = new Book();
            ob [i].getData();
            System.out.println ("-- --");
        }
        System.out.println ("Details of all Books");
    }
}
```

```
for(i=0; i<n; i++)
```

```
{
```

```
    system.out.println("Book : " + (i+1));
```

```
    system.out.println(ob[i] to string());
```

```
}
```

```
}
```

```
}
```



Administrator: Command Prompt

D:\akash-java>java BookMain

Constructor values:

Book: abc

Author: xyz

Price: 100rs

Number of pages:500

Enter number of books:

1

Enter Book name:

rrr

Enter Author name:

rk

Enter Book price:

500

Enter number of pages:

200

Details of all books:

Book : 1

Book: rrr

Author: rk

Price: 500

Number of pages:200

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 one of the classes contain only the method printArea() that prints the area of the given shape.

I
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shape .java

```
import java.util.Scanner;  
abstract class shape {  
    int int1, int2;  
    abstract double printArea();  
}
```

```
class Rectangle extends shape {
```

```
    Rectangle (int a, int b) {
```

```
        int1 = a;
```

```
        int2 = b;
```

```
}
```

```
    double printArea () {
```

```
        System.out.println ("For Rectangle ");
```

```
        return int1 * int2;
```

```
}
```

```
}
```

```
class Triangle extends shape {
```

```
    Triangle (int a, int b) {
```

```
        int1 = a;
```

```
        int2 = b;
```

```
}
```

```
    double printArea () {
```

```
System.out.println("For Triangle ");
return (int1 * int2) / 2;
}
```

```
}
```

```
class circle extends shape {
```

```
circle(int a) {
```

```
int1 = a;
```

```
}
```

```
double printArea() {
```

```
System.out.println("For Circle ");
return 3.14 * int1 * int1;
```

```
}
```

```
}
```

```
class shapeMain {
```

```
public static void Main(String arge[]) {
```

```
Rectangle r = new Rectangle(10, 20);
```

```
Triangle t = new Triangle(20, 30);
```

```
Circle c = new Circle(3.5);
```

```
System.out.println("Area of Rectangle is: " + r.printArea());
```

```
System.out.println("Area of triangle is: " + t.printArea());
```

```
System.out.println("Area of circle is: " + c.printArea());
```

```
}
```

```
}
```

Administrator: Command Prompt

D:\akask-java>javac ShapeMain.java

D:\akask-java>java ShapeMain

For Rectangle

Area of Rectangle is:200.0

For Triangle

Area of Triangle is:300.0

For Circle

Area of Circle is:3846.5

D:\akask-java>

Lab 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 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

Account.java

```
import java.util.Scanner;  
class account  
{  
    private String name;  
    private double account_no;  
    private char account_type;  
    private double balance;  
    void getdata (char ch)  
{  
        Scanner xx = new Scanner (System.in);  
        System.out.println ("Enter the name of customer :");  
        name = xx.next();  
        xx.nextLine();  
        System.out.println ("Enter the account number of customers :")  
        account_no = xx.nextDouble();  
        System.out.print ("Enter the balance of the customer :");  
        balance = xx.nextDouble();  
        account_type = ch;  
    }  
    void updatebalance (double n)  
{  
        balance = balance + n;  
    }  
}
```

```
void updatebalance (double x)
```

```
{
```

```
    balance = balance - x;
```

```
}
```

```
double getbalance ()
```

```
{
```

```
    return balance;
```

```
}
```

```
void displaybalance ()
```

```
{
```

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

```
}
```

```
}
```

```
class Saving_Account extends Accounts {
```

```
private double interest_rate;
```

```
Saving_Account ()
```

```
{
```

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

```
get data ('s');
```

```
System.out.println ("Enter the Interest rate: ");
```

```
interest_rate = xx.nextDouble();
```

```
}
```

```
void get Deposit ()
```

```
{
```

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

classmate

```
System.out.println("Enter amount to be deposited : ");
double x = scanner.nextDouble();
updateBalance(x);
}

Void computeInterest ();
{
    double x = (getBalance() * interestRate) / 100;
    updateBalance(x);
    System.out.println("The computed interest is : " + x);
    displayBalance();
}

Void withdrawl ()
{
    System.out.println("Enter the amount to be withdrawn : ");
    Scanner nn = new Scanner(System.in);
    double n = nn.nextDouble();
    while (n > getBalance())
    {
        System.out.println("The amount withdrawn is more than the
                           balance enter again : ");
        updateBalance(n);
        displayBalance();
    }
}
```

```
class Current_Account extends Account {  
    private double min_balance;  
    private int cheq_book;  
    Current_Account()  
{  
        Scanner x = new Scanner(System.in);  
        getData('c');  
        System.out.println("Enter the minimum blance :");  
        min_balance = x.nextDouble();  
    }  
  
    void getDeposit()  
{  
        Scanner xx = new Scanner (System.in);  
        System.out.println("Enter amount of the check :");  
        double x = xx.nextDouble();  
        if (x > (getBalance () - min_balance))  
        {  
            System.out.println ("You have issued a check of more than the  
                minimum balance and you have been charged a  
                penalty!");  
            updateBalance (100);  
        }  
        else  
        {  
            updateBalance (x);  
        }  
    }
```

```
displaybalance();
```

```
}
```

```
void withdraw()
```

```
{
```

```
System.out.println("Enter the amount to be withdrawn :");
```

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

```
double x = x.nextDouble();
```

```
while (n > (getBalance() - min_balance))
```

```
{
```

```
System.out.println("The account withdrawn is more than the  
balance enter again : ");
```

```
x = x.nextDouble();
```

```
}
```

```
updateBalance(n);
```

```
displayBalance();
```

```
}
```

```
}
```

```
class AccountMain {
```

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

```
{
```

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

```
char ch;
```

```
System.out.println("Enter the type of account you want (C/S)");
```

```
ch = input.next().charAt(0);
```

```
if (ch == 'S' || ch == 's')
```

```
{
```

classmate

```
Saving_Account s=new Saving_Account();  
int n=1;  
while (n!=0)  
{  
    System.out.println("Enter 0 for exit: ");  
    System.out.println("Enter 1 for deposit: ");  
    System.out.println("Enter 2 for balance enquiry: ");  
    System.out.println("Enter 3 for calculate intrest: ");  
    System.out.println("Enter 4 for withdrawl : ");  
    n = input.nextInt();  
    if (n == 0)  
        break;  
    else if (n == 1)  
    {  
        s.getdeposit();  
    }  
    else if (n == 2)  
    {  
        s.displaybalance();  
    }  
    else if (n == 3)  
    {  
        s.displaybalance();  
    }  
    else if (n == 4)  
    {  
        s.withdrawl();  
    }  
}
```

{

S. computeintrest();

}

else if (n==4)

{

S. withdrawal();

}

}

}

else

{

Current_Account S=new Current_Account();

int n=1;

while (n!=0)

{

System.out.println("Enter 0 for exit: ");

System.out.println("Enter 1 for deposit: ");

System.out.println("Enter 2 for balance enquiry: ");

System.out.println("Enter 3 to apply for cheque: ");

System.out.println("Enter 4 for withdrawl: ");

x=input.nextInt();

if (n==0).

break;

else if (n==1)

{