

A1

Develop a Java program that prints all real solutions to the quadratic eq². $ax^2 + bx + c = 0$.
Read in a,b,c and use the formula $b^2 - 4ac$ for discriminant.

dab - 1

import java.util.*;

public class main {

public static void main (String [] args)

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

int a,b,c;

double D, γ_1 , γ_2 ;

System.out.println ("Enter the values of a, b and c");

a = sc.nextInt();

b = sc.nextInt();

c = sc.nextInt();

D = (b * b) - (4 * a * c);

if (D == 0)

{

System.out.println ("Roots are equal and equal"),

$$\gamma_1 = \gamma_2 = \frac{-b}{2a};$$

System.out.println ("n" + " + " + "n2);

}

else if (D > 0)

{

System.out.println ("Roots are real and distinct");

$$\gamma_1 = (-b + \sqrt{D}) / 2a;$$

$$\gamma_2 = (-b - \sqrt{D}) / 2a;$$

System.out.println ("n1" + " + " + "n2");

}

use
{

 System.out.println("No roots does not exist");

}
}

}

```
Enter the values of a,b ad c in Quadratic Equation ax^2+bx+c
```

```
2  
9  
7
```

```
Roots are real and distinct
```

```
-4.0 -14.0
```

```
Process finished with exit code 0
```

```
|
```

Q

Q2

Develop a Java program to create a class student with members name, roll, marks array credit and marks. Include method to accept and display details and method to calculate SGPA.

Lab - 2

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

```
class studentmarks
```

```
{
```

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

```
float[] credit = new float[5];
```

```
float[] mark = new float[5];
```

```
float[] sgpa = new float[5];
```

```
float sum = 0.0;
```

```
int usn;
```

```
float sgpa;
```

```
String name;
```

```
void setData()
```

```
{
```

```
System.out.println("Enter Student's name");
```

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

```
System.out.println("Enter the USN");
```

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

```
System.out.println("Enter the marks obtained  
by the student in each five subjects");
```

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

{

marks[i] = sc>NextFloat();

if (marks[i] >= 90 && marks[i] <= 100)

{

sgpas[i] = 10;

}

elseif (marks[i] >= 80 && marks[i] < 90)

{

sgpas[i] = 9;

}

elseif (marks[i] >= 70 && marks[i] < 80)

{

sgpas[i] = 8;

}

elseif (marks[i] >= 60 && marks[i] < 70)

{

sgpas[i] = 7;

}

elseif (marks[i] >= 50 && marks[i] < 60)

{

sgpas[i] = 6;

}

else if (marks[i] >= 40 & marks[i] < 50)

{

sgpas[i] = 5;

}

else

sgpas[i] = 0;

}

System.out.println("Enter the credits in each subject")

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

{

credits[i] = sc.nextInt();

}

}

float catogpa()

{

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

{

sum = sum + (sgpas[i] * credit[i]);

}

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

{

c = c + credit[i] * 1;

}

Sgpa = sum/c;

return sgpa;

}

Void getdata() {

{

System.out.println("Enter details of student: \n");
" " " ("Name:" + name);
" " " ("U.S.N" + usn);

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

{

System.out.println(marks[i] + " ");

}

}

Class Student

{

public static void main(Sting[] args) {

{

Scanner a = new Scanner(System.in);

student marks[] st;

st = new student Marks[5];

System.out.println("Enter number of students");
int n = a.nextInt();

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

```
{
```

```
    st[i] = new student Mackel();
```

```
System.out.println("Enter the data of "(i+1)).
```

```
st[i].setdata();
```

```
st[i].getdata();
```

```
float c = st[i].calsgpa();
```

```
System.out.println "G.P.A is :" + c);
```

```
}
```

```
{
```

```
}
```

```
Enter the number of students:
```

```
2
```

```
Enter the data of student1
```

```
Enter the name of the student
```

```
Abhi
```

```
Enter the USN of the student
```

```
1
```

```
Enter the marks obtained by the student in each of the five subjects
```

```
99
```

```
96
```

```
95
```

```
94
```

```
91
```

Enter the credits of each subject

5

5

5

4

4

Name: Abhi

U.S.N: 1

99.0

96.0

95.0

94.0

91.0

S.G.P.A of the Student is: 10.0

Enter the data of student2

Enter the name of the student

Amit

Enter the USN of the student

2

(03) Create a class Book which contains four member: name, author, price, num_pages
Include a constructor to set the values for the members. Include a method to set and get details of the objects. Include toString meth() to display details.

Lab-3

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

```
class bookdet
```

```
{ String name, aname;
```

```
float price;
```

```
int pages;
```

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

```
void bookdet(String name, String aname, float price,  
            int pages);
```

```
{
```

```
    this.name = name;
```

this.name = name;

this.page = page;

this.price = price;

}

public String toString()

{

return ("\\n" + name + "\\n" + author + "\\n" + price + "\\n" +
pages + "\\n");

}

}

public class Book

public static void main (String args[])

{

book arr [] b = new book arr [10];

Scanner sc = new Scanner (System.in);

System.out.println ("Enter no. of books");

int n = sc.nextInt();

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

{

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

String name = sc.nextLine();

System.out.println ("Enter author name");

String author = sc.nextLine();

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

float price = sc.nextInt();

System.out.println("Enter total pages");

int pages = sc.nextInt();

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

b[i] = new bookdet();

b[i].bookdet(name, author, price, pages);

}

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

{

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

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

}

}

}

```
Enter the number of books
```

```
2
```

```
Enter the name:
```

```
harry
```

```
Enter the author's name
```

```
jk
```

```
Enter the price
```

```
560
```

```
Enter total pages:
```

```
555
```

```
Enter the name:
```

```
brut
```

```
Enter the author's name
```

```
amiy
```

```
Enter the price
```

```
456
```

```
Enter total pages:
```

```
123
```

```
Details of book1
```

```
harry
```

```
jk
```

```
560.0
```

```
555
```

```
Details of book2
```

```
brut
```

```
amiy
```

```
456.0
```

```
123
```

```
Process finished with exit code 0
```

Q4

Develop a java program to create an abstract class named shape that contains two integers and an empty method named print area(). Provide three classes name rectangle, triangle and circle , It each extends the class shape.

Lab 4

import java.awt.*;

abstract class shape {

{ Scanner sc = new Scanner (System.in);
int a = 6, b = 4;

abstract void print-area();

}

class rectangle extends shape {

public int rect-area;

void rectangle ()

{

System.out.println ("Area of rectangle");

}

void print-area ()

{

rect-area = a * b;

System.out.println ("The area of rectangle is "+ rect-area);

b

2

class triangle extends shape {

double tri-area;

```
void print_area()
```

```
{
```

$$\text{tri_area} = (0.5 * a * b);$$

```
System.out.println("The area of triangle is " + tri_area);
```

```
}
```

```
}
```

```
double ci_area;
```

```
void print_area()
```

```
{
```

$$ci_area = (3.14 * a * a);$$

```
System.out.println("The area of circle is : " +  
ci_area);
```

```
}
```

```
Class Main
```

```
{
```

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

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

```
{
```

```
rectangle r = new rectangle();
```

```
r.print_area();
```

```
triangle t = new triangle();
```

```
t.print_area();
```

```
circle c = new circle();
```

```
c.print_area();
```

```
}
```

```
C:\Program Files\Java\jdk1.8_201\bin\java.exe -jar  
The area of rectangle is 24  
The area of triangle is 12.0  
The area of circle is: 113.03999999999999  
Process finished with exit code 0
```

(5)

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called saving and other called current a/c. The saving a/c contains compound interest and withdrawal facility, but no cheque book facility. The current a/c provides cheque book facility but no interest. Current a/c holders should also maintain a minimum balance. If balance falls below a service charge is charged. Create a class Account that stores customer's name, a/c no. and a/c type. From this derive the classes curr acc and saving acc. To make specific for requirements include a necessary method → ① to display balance ② compute and deposit interest ③ permit withdraw and update ④ check for min balance, impose penalty if necessary.

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 fine();

abstract void inter();

}

Class curu-acc extends account

{

curu-acc (String n, String a, String t, double b)

{

super (n, a, t, b);

{

void fine()

{

if (balance < 500)

{

System.out.println("You will be fined 200 Rs
because min balance should be 500");
display();

}

else

{

System.out.println("You will be charged fine")
not

}

void display()

{

System.out.println("Name of A/c holder" + name),

System.out.println("A/c no." + acc_no),

" " " ("Type" + type),

" " " ("Balance:" + balance),

}

void deposit()

{

double sum;

Scanner sc = new Scanner(System.in),

System.out.println("Enter Amount"),

sum = sc.nextDouble();

balance = balance + sum;

display();

void withdraw()

{

 double sum;

 Scanner sc = new Scanner(System.in);

 System.out.println("Enter the amount to withdraw");

 sum = sc.nextDouble();

 balance = balance - sum;

 if (balance > 1000)

 500

}

 display();

}

else

{

 System.out.println("You cannot withdraw");

 fine();

}

}

void enter()

{

 System.out.println("No Interest");

}

{

where sav-account extends account.

{

sav-acct (string n, string a, string t, double b)

{

super (n, a, t, b);

}

void display()

{

System.out.println ("Name of a/c holder", name);

System.out.println ("A/C NO.", acc-no);

System.out.println ("Type:", + type);

System.out.println ("Balance", + balance);

}

void withdraw()

{

double sum;

Scanner sc = new Scanner (System.in);

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

double sum = sc.nextDouble();

balance = balance - sum;

display();

}

void deposit()

{

int sum;

Scanner sc = new Scanner (System.in);

System.out.println("Enter principal to deposit");

sum = sc.nextInt();

balance += sum;

display();

{

void interest()

{

double r, t;

double interest, amount, power;

Scanner sc = new Scanner (System.in);

System.out.println("Enter rate of interest");

r = sc.nextDouble();

System.out.println("Enter time");

t = sc.nextDouble();

power = Math.pow(1 + ((r)/100)), t);

amount = bal * power;

System.out.println("Interest : " + interest);

display();

{

class Test1 {

{

 public static void main(String args[]) {

{

{

{

```
System.out.println("2: Deposit");
" " " ("3: withdraw");
" " " ("4: exit");
" " " ("Enter your choice");
counter = sc.nextInt();
switch (counter) {
```

} case 1:

```
a. fine();
break;
```

} case 2:

} a.deposit()
break;

case 3 :

```
a.withdraw();
break;
```

case 4.

```
System.exit(status);
break;
```

} while (counter != 4);
break;

case 5:

```
sav_acc = new sav_acc(name, acc_num, typ, bal);
a = 8;
```

int curr;

do

{

System.out.println("1: deposit");
" " " ("2: withdraw");
" " " ("3: interest");
" " " ("4: exit");
" " " ("Enter");

curr = next.nextInt();

switch(curr)

{

case 1:

a. deposit();
break;

case 2:

a. withdraw();
break;

case 3 :

a. interest();

case 4 :

a. System.exit(status);
break;

}

} while (curr!=4);
break;

case 3 :

System.exit(status);
break;

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

    }

} while(cnr!=5);
break;

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

OUTPUT:

```
Enter the name of the account holder
aKASH
Enter the Account Number
123we
Enter the Minimum Balance in the account
3000

1: Current Account
2: Savings Account
3: Exit

Enter your choice
1
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit

Enter Your Choice
2
Enter the Amount You Want To Deposit
23456
Name Of the Account Holder is aKASH
Account Number of the Account Holder is 123we
```

```
Type Of the Account od the Account Holder is Current Account
Balance In Your Account is 26456.0
```

```
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
```

```
Enter Your Choice
```

```
1
```

```
You Will Not Be Charged Any Fine
```

```
Name Of the Account Holder is aKASH
```

```
Account Number of the Account Holder is 123we
```

```
Type Of the Account od the Account Holder is Current Account
Balance In Your Account is 26456.0
```

```
1: Check For Fine
2: Deposit
3: Withdraw
4: Exit
```