

WEEK - 3

LAB 1 : Roots of quadratic equation.

Algorithm :

Step 1 : Start

Step 2 : Read a, b, c in $ax^2 + bx + c$

Step 3 : $D = b^2 - 4ac$

Step 4 : If D is less than 0, Print invalid roots & exit
else step 5

Step 5 : Calculate $x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$

and $x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$

Step 6 : Print x_1 and x_2 .

Step 7 : Stop.

Program :

```

import java.util.*;
class quadratic
{
    public static void main (String [] args)
    {
        int a, b, c;
        double d, x1, x2;
        Scanner in = new Scanner (System.in);
        System.out.println ("Enters a,b,c in ax2 + bx + c");
        a = in.nextInt();
        b = in.nextInt();
        c = in.nextInt();
    }
}

```

$$d = (b * b) - (4 * a * c);$$

if ($d < 0$)

{

System.out.println ("Imaginary roots // No real solutions");
return;

}

$$x1 = ((-1 * b) + \text{Math.sqrt}(d)) / (2 * a);$$

$$x2 = ((-1 * b) - \text{Math.sqrt}(d)) / (2 * a);$$

System.out.println ("Root 1: " + x1 + " | Root 2: " + x2);

3

3.

Output

Enters a, b, c in $ax^2 + bx + c$

1

10

4

Root 1: -0.417

Root 2: -9.582

```
C:\Users\RAJ\Desktop\c prog\Java>javac quadratic.java
```

```
C:\Users\RAJ\Desktop\c prog\Java>java quadratic
```

```
Enter a,b,c in a(x^2)+bx+c
```

```
1
```

```
10
```

```
4
```

```
Root 1: -0.41742430504416017
```

```
Root 2: -9.582575694955839
```

```
C:\Users\RAJ\Desktop\c prog\Java>java quadratic
```

```
Enter a,b,c in a(x^2)+bx+c
```

```
20
```

```
1
```

```
1
```

```
Imaginary Roots//No real Solutions
```

```
C:\Users\RAJ\Desktop\c prog\Java>
```

WEEK 4LAB 2:

Java program to create class Student with members USN, name, credits, marks. Include methods to accept & display details & to calc SGPA

Step 1: Create class student with members & methods

Step 2: Read USN, Name, credits, marks from user

Step 3: Find grade point from marks

Step 4: Calc SGPA by using $SGPA = \frac{\sum_{i=1}^5 Credits[i] \times GradePoint[i]}{TotalSubjects}$

Step 5: Print USN, Name, SGPA.

Program:

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

```
class student
```

```
{
```

```
String USN, name;
```

```
int credits[] = new int[5]
```

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

```
double SGPA;
```

```
void input()
```

```
{
```

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

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

```
USN = in.nextLine();
```

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

```
System.out.println("Enter Credits in all Subjects")
```

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

```
credits[i] = nextInt();
```

System.out.println ("Enters Marks in all subjects, in same order as credits");

```

for (int i=0; i<5; i++)
  marks[i] = ih.nextFloat();
  }

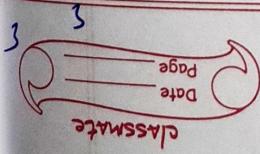
void calcsgpa()
{
  int sum=0, totcs=0;
  for (int i=0; i<5; i++)
  {
    totcs += credits[i];
    if (marks[i]>=89.5 && marks[i]<=100)
      sum += 10 * credits[i];
    else if (marks[i]>=79.5 && marks[i]<89.5)
      sum += 9 * credits[i];
    else if (marks[i]>=69.5 && marks[i]<79.5)
      sum += 8 * credits[i];
    else if (marks[i]>=59.5 && marks[i]<69.5)
      sum += 7 * credits[i];
    else if (marks[i]>=49.5 && marks[i]<59.5)
      sum += 6 * credits[i];
    else if (marks[i]>=39.5 && marks[i]<49.5)
      sum += 4 * credits[i];
    else
      sum += 0 * credits[i];
  }
}
  
```

$$sgpa = \frac{sum}{(double)totcs};$$

void display

```

System.out.println ("In USN : " + usn + " In Name : " + name +
                    " In SGPA : " + sgpa);
  
```



Class student

{

public static void main (String [] args)

{

student s = new student();

s.input();

s.calcsgpa();

s.display();

3

3

output

Enter USN Name

1BM19CS147

Shaishank Sharma

Enter credits in all subjects

5

4

4

4

3

Enter marks in all subjects in same order as credits

70

80

79

89.5

98

Name : S USN : 1BM19CS147

Name : Shaishank Sharma

SGPA : 8.9

```
C:\Users\RAJ\Desktop\c prog\Java>javac studet.java
C:\Users\RAJ\Desktop\c prog\Java>java studet
Enter USN, Name
1BM19CS147
Shashank Sharma
Enter Credits in all subjects
5
4
4
4
3
Enter Marks in all subjects in same order as credits
70
80
79
89.5
98
USN: 1BM19CS147
Name: Shashank Sharma
SGPA: 8.9
C:\Users\RAJ\Desktop\c prog\Java>
```

WEEK - 5 // LAB - 3

1. Create class book which contains four members, name, authors, price, num-pages. Include constructors to set values, do a static method to display book detail. n book objects

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

```
class book
```

```
{
```

```
String name;
```

```
String authors;
```

```
int price;
```

```
int num-pages;
```

```
book()
```

```
{
```

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

```
System.out.println ("Enter book Name");
```

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

```
System.out.println ("Enter authors Name");
```

```
authors = in.nextLine();
```

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

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

```
System.out.println ("Enter no. of pages");
```

```
num-pages = in.nextInt();
```

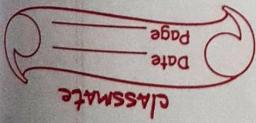
```
}
```

```
public String toString()
```

```
{
```

```
return ("In BookName: " + name + " Authors: " + authors +  
" In Price: " + price + " In No of pages: " +  
num-pages);
```

```
}
```



Class bookmark

2
public static void main (String args) {

int n;

Scanner in = new Scanner (System.in);

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

n = in.nextInt();

book b[] = new book[n];

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

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

b[i] = new book();

3

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

3

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

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

3

3

Output

Enters no. of books

1

Enters details of book 1.

Enters book Name

Java

Enters Author's name

me

Enters price

5000

Enter no of pages
500

Details of book 1

Book Name : Jana

Author : m e

Price : 5000

No of pages : 500.

```
C:\Users\RAJ\Desktop\c prog\Java\Week 5>java bookmain
Enter Number of books
Enter details of Book 1
Enter Book name
ava
Enter author name
e
Enter Price
000
Enter no of pages
00
Enter details of Book 2
Enter Book name
C++
Enter author name
me@
Enter Price
10000
Enter no of pages
1000

Details of Book 1
Book Name: Java
Author: me
Price: 5000
No of pages: 500

Details of Book 2
Book Name: C++
Author: me@
Price: 10000
No of pages: 1000
```

```
C:\Users\RAJ\Desktop\c prog\Java\Week 5>
```

Week 6 // LAB PROGRAM 4

Develop Java prog to create abstract class Shape that has 2 integers & empty method printArea(). Provide 3 classes Rectangle, Triangle & Circle such that each one of the classes extends Shape. Each ~~class~~ contains area() that prints area of given shape

```
import java.util.*;  
abstract class Shape  
{
```

```
    double dimen1;  
    double dimen2;  
    Shape(double a, double b)  
    {
```

```
        dimen1=a;  
        dimen2=b;
```

```
    }  
    abstract void printArea();
```

```
    class rectangle extends Shape  
{
```

```
        rectangle(double a, double b)  
        {
```

```
            super(a,b);
```

```
        }  
        void printArea()  
        {
```

```
            System.out.println("Area of Rectangle is : "+
```

dimen1*
dimen2);

3

class triangle extends shape

3

triangle (double a, double b)

3

super(a,b);

3

void printarea()

3

System.out.println("In Area of triangle is: " + 0.5 *

dimen1 *

dimen2);

3

class Circle extends shape

3

circle (double a, double b)

3

super(a,b);

3

void printarea()

3

System.out.println("In Area of circle is: " + 3.14 *

dimen1 *

dimen2);

3

class abstractShape

3

public static void main (String [] args)

3

Scans in = new Scanners (System.in);
int ch;
double d1, d2;
while (true)
{

System.out.println ("1. Area of Rectangle\n2. Area of Triangle\n3. Area of Circle\n0. EXIT");

ch = in.nextInt();

switch (ch)

{

case 1 : System.out.println ("Enters length &
d1 = in.nextDouble(); breadth l = ");
d2 = in.nextDouble();
rectangle r1 = new rectangle (d1, d2);
r1.printarea();
break;

case 2 : System.out.println ("Enters height & base l n");
d1 = in.nextDouble();
d2 = in.nextDouble();
triangle t1 = new triangle (d1, d2);
t1.printarea();
break;

case 3 : System.out.println ("Enters R ");
d1 = in.nextDouble();
circle c1 = new circle (d1, d1);
c1.printarea();
break;

case 0 : return true;

default : System.out.println ("Ent Valud Charect");

(continue);

3
3
3
3

Output

1. Area of Rectangle
2. Area of triangle
3. Area of circle

3

Enter radius

10

Area of circle is: 314.0

1. Area of Rectangle

:

:

0

C:\Users\RAJ\Desktop\c prog\Java\New folder>java abstractshapes

1.Area of Rectangle
2.Area of Triangle
3.Area of circle
0.Exit

1
Enter Length and breadth

5
10

Area of Rectangle is: 50.0

1.Area of Rectangle
2.Area of Triangle
3.Area of circle
0.Exit

2
Enter Height and Base

10
5

Area of Triangle ist: 25.0

1.Area of Rectangle
2.Area of Triangle
3.Area of circle
0.Exit

3
Enter Radius

10

Area of circle ist: 314.0

1.Area of Rectangle
2.Area of Triangle
3.Area of circle
0.Exit

4
Enter Valid Choice

1.Area of Rectangle
2.Area of Triangle
3.Area of circle
0.Exit

5

C:\Users\RAJ\Desktop\c prog\Java\New folder>

WEEK 6/CAB PROGRAM 5

Bank.java

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

```
class Account
```

```
{
```

```
String cust-name;
```

```
int acc-num;
```

```
String acc-type;
```

```
double balance;
```

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

```
Account ( String cust-name , int acc-num , String acc-type ,  
double balance )
```

```
{
```

```
this.cust-name = cust-name ;
```

```
this.acc-num = acc-num ;
```

```
this.acc-type = acc-type ;
```

```
this.balance = balance ;
```

```
}
```

```
void customer()
```

```
{
```

```
System.out.println ("The " + this.acc-type + " Status is :");
```

```
System.out.println ("Customer Name: " + this.cust-name)
```

```
System.out.println ("Account Number: " + this.acc-num);
```

```
System.out.println ("Account Type : " + this.acc-type);
```

```
}
```

```
void Balance_Status()
```

```
{
```

```
System.out.println ("Balance Amount : " + this.balance);
```

3 void deposit()

4 System.out.println("Enter deposit Amount : ");
double deposit = in.nextDouble();
balance += deposit;

3

3 class Savings extends Account

4 double withdraw;
double deposit;
int rate, time;
double bal, interest;

Savings (String cust-name, int acc-num, String acc-type, double balance)

4 super(cust-name, acc-num, acc-type, balance);

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

void compoundInterest()

4

System.out.println("C I : ");

System.out.println("Rate : ");

rate = in.nextInt();

System.out.println("Time : ");

time = in.nextInt();

bal = balance * Math.pow((1 + (rate / 100)), time);

interest = bal - balance

System.out.println("C I is : " + interest);

balance = bal;

Scanned N 3rd term (Math) notes - 2020

void withdraw()

{

System.out.println("Enter withdraw amount: ");

withdraw = in.nextDouble();

if (balance < withdraw)

{

System.out.println("Not enough balance. Can't withdraw");

withdraw = 0.0;

}

else

balance -= withdraw

System.out.println("Amount withdrawn = " + withdraw);

3

Class Current extends Account

{

double withdraw;

double deposit;

double minBalance = 500.0;

Scanner in = new Scanner (System.in);

Customer custName, int accNum, String accType,
double balance)

{

super(custName, accNum, accType, balance);

3

void withdraw()

{

System.out.print("Withdraw amount: ");

withdraw = in.nextDouble();

if (balance < withdraw)

{

System.out.println("Not enough balance");

(can't withdraw');

withdraw = 0.0;

}
else

balance -= withdraw

System.out.println ("Amount withdrawn = " + withdraw);

}
void minimumBalance ()

{
if (balance < min_balance)
{

System.out.println ("as balance is less than
min balance (500), service charge of 500
imposed.");

balance = balance - 500;

}

}
class bank

{
public static void main (String args [3])

String cust_name;

int acc_num;

int type;

double ~~balance~~ balance;

Scanner in = new Scanner (System.in);

System.out.println ("Customer name : ");

cust_name = in.next();

System.out.println ("Acc No. : ");

acc_num = in.nextInt();

System.out.println ("Acc Type. ");

System.out.println("1. Savings Acc");
System.out.println("2. Current Acc");
if (type == 1) {
 type = ih.nextInt();

System.out.println("Enter balance amount : ");

balance = ih.nextInt();

Savings s = new Savings(cust_name, acc_num, "Savings",
balance);

s.customers();

s.balance_Status();

s.deposit();

s.balance_Status();

s.withdraw();

s.balance_Status();

s.compound_Interest();

s.customers();

s.balance_Status();

3

else if (type == 2)

2

System.out.println("Enter balance amount : ");

balance = ih.nextInt();

Current c = new Current(cust_name, acc_num, "Current",
balance);

c.customers();

c.balance_Status();

c.deposit();

c.balance_Status();

c.withdraw();

c.balance_Status();

c.minimum_Balance();

c. customer(),
c. balance-status()

'else

System - out. problem ("invalid choice")

↑
3 O/P

Enters customers name

A

Enters acc no.

1

Account type

1. Savings Acc
2. current Acc

2

Enters balance amount : 1000

current status :

Customers name : A

Acc no : 1

Acc type : current

Balance : 1000.0

Enters deposit amount : 6000

Enters amount to be withdrawn : 4000

Amount withdraw = 4000.0

Balance Amount : 3000.0

Since balance amount is less than min balance (5000),
service charge of 500 imposed

The current status is:

Customers name : A

Acc no : 1

Acc type : current

Balance : 2500.0

```
C:\Users\RAJ>cd C:\Users\RAJ\Desktop\c prog\Java\Week 6
C:\Users\RAJ\Desktop\c prog\Java\Week 6>javac bank.java
C:\Users\RAJ\Desktop\c prog\Java\Week 6>java bank
Enter Customer Name :
shash
Enter Account Number :
123
Enter Account Type :
1. Savings Account
2. Current Account
2
Enter the balance amount :
1000
The Current status is:
Customer Name: shash
Account number: 123
Account Type: Current
Balance Amount: 1000.0
Enter deposit amount :
6000
Balance Amount: 7000.0
Enter the amount to be withdrawn:
4000
Amount withdrawn = 4000.0
Balance Amount: 3000.0
Since balance amount is less than the minimum balance(5000), service charge of 500 is imposed.
The Current status is:
Customer Name: shash
Account number: 123
Account Type: Current
Balance Amount: 2500.0
C:\Users\RAJ\Desktop\c prog\Java\Week 6>
```