



## WEEK 3

① Write a program to calculate roots of a quadratic equation ( $ax^2 + bx + c = 0$ )

STEP 1 INPUT a, b, c

STEP 2  $D = b * b - 4 * a * c$

STEP 3 If ( $D > 0$ )  
 PRINT Real Roots  
 Roots are  $(-b + \sqrt{D}) / (2 * a)$   
 Roots are  $(-b - \sqrt{D}) / (2 * a)$

EISE IF ( $D = 0$ )

PRINT EQUAL Roots  
 Roots is  $(-b) / (2 * a)$

ELSE

PRINT IMAGINARY ROOTS

~~PRINT~~

Roots are  $(-b + i\sqrt{-D}) / (2 * a)$

Roots are  $(-b - i\sqrt{-D}) / (2 * a)$

STEP 4 STOP

## Java code

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

public class quadratic
{
    private static int double a;
    private static double b;
    private static double c;
    public static void read()
    {
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter the Co-efficient a");
        a = sc.nextDouble();
        System.out.println("Enter the Co-efficient b");
        b = sc.nextDouble();
        System.out.println("Enter the Co-efficient c");
        c = sc.nextDouble();
    }
}
```

```
public static void calc()
```

```
    read();
    double d = b * b - 4 * a * c;
    if (d > 0)
    {
        System.out.println("ROOTS ARE REAL AND DISTINCT");
    }
```

System.out.println("First root is " + (-b + Math.

$\sqrt{d}) / (2 * a))$ ;

System.out.println("Second root is " + (-b - Math.

$\sqrt{d}) / (2 * a))$ ;

}

else if (d == 0)

System.out.println("Roots are equal");

System.out.println("Roots are " + (-b) / (2 \* a));

);

}

else

{

System.out.println("Roots are imaginary");

System.out.println("Roots are " + (-b) / (2 \* a))

+ " + " + "i" +

(Math.sqrt(-d)) / (2 \* a))

);

System.out.println("Roots are " + (-b) / (2 \* a))

+ " - " + "i" + " + Math.

.sqrt(-d))

);

}

(else have while condition)

}

$a^2 - d^2 = b \sin 2\theta$

$(a < b)$

public static void main (String [] args)

{

value();

}

ALGORITHM:

STEP 1

START

STEP 2 Read number of subjects, usn, name, credit P, mark[] from the user

STEP 3 fun() (grade.)  
 If  $i = 0$  to  $n$   
 if  $\text{mark}[i] \geq 90 \& \text{mark}[i] \leq 900$   
 Return 10

else if  $\text{mark}[i] >= 80 \& \text{mark}[i] < 90$   
 return 7

else if  $\text{mark}[i] >= 70 \& \text{mark}[i] < 60$   
 return 8

else if  $\text{mark}[i] >= 60 \& \text{mark}[i] < 50$   
 return 7

else if  $\text{mark}[i] >= 50 \& \text{mark}[i] < 40$   
 return 6

else  
 return "fail"

STEP 4 PTO (NextPage) . . . .

for i = 0 to n  
c = grade (mark[i])  
sum\_credit += credit[i];  
sum += c \* credit[i];  
  
sgpa = sum / sum - credit;

STEP 5 PRINT sgpa

Date \_\_\_\_\_

A program to calculate SGPA of student

import java.util.\*;

public class Lab2

{

private static int n;

private static String usn;

private static String name;

private static int credit[];

private static double mark[];

public static void read()

{

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number  
of students");

n = sc.nextInt();

credit = new int[n];

mark = new double[n];

System.out.println("Enter the name of  
student").

name = sc.next();

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

usn = sc.next();

System.out.println("Enter the credits  
of subject");

Date / /

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

{

```
System.out.print("Enter credit in  
subject " + " " +  
(i+1));
```

```
credit[i] = sc.nextInt();
```

}

```
System.out.print("Enter the marks in subject  
" + ");
```

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

{

```
System.out.print("Enter marks in  
subject " + " " +  
(i+1));
```

```
mark[i] = sc.nextDouble();
```

}

```
public static int grade(double marks)
```

```
if (marks >= 90 & & marks <= 100)  
return 10
```

```
else if (marks >= 80 & & marks < 90)
```

```
{ return 9
```

{

Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

```
else if (marks >= 70 & & marks < 80 )  
{
```

```
    return 4.8;
```

```
}
```

```
else if (marks >= 60 & & marks < 50 )  
{
```

```
    return 3.7;
```

```
}
```

```
else if (marks >= 50 & & marks < 60 )  
{
```

```
    return 6;
```

```
}
```

```
else if (marks >= 40 & & marks < 50 )  
{
```

```
    return 5;
```

```
}
```

```
else
```

```
{
```

```
    System.out.println ("You have failed");  
    return 0;
```

```
}
```

```
}
```

public static double calculate()

```

    read()
    double sgpa;
    double sum_credits = 0;
    double sum = 0;
    int c;
    for (int i = 0; i < n; i++)
    {
        c = grade[mark[i]];
    }

```

```

        sum_credits += credit[i];
        sum = sum + c * credit[i];
    }
    sgpa = (double) (sum / sum_credits);
    return sgpa;
}

```

public static void main (String[] args)

```

Scanner sc = new Scanner(System.in);
double sgpa = calculate();
System.out.println ("Name of Student"
                    + name);

```

System.out.println ("Marks are ");

```

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

```

```

    System.out.print ("Mark in Subject "
                    + " " + (i + 1)
                    + " is " + "(t)");
}
```

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

Date \_\_\_\_\_

System out.println ("SGPA of Student is "+  
sgpa);

# LAB 3

Date \_\_\_\_\_

Saath

## Algorithm

Step 1 Start

class book

Step 2 Take inputs for name, autho  
r price and no of pages, using  
constructor

Step 3 toString()

return "Name is :" + name + "Autho  
is " +  
author  
+ "Price is " +  
price

+ "Number of page  
are " + no of  
pages

End class book

class Test

STEP 4: book obj = new book()  
for i = n

take input from user each  
object and its instance  
variable

Date / /

STEP 5 for i=0 to n

display obj[7]

STEP 6 End

Date: / /

## → Lab 3

```
import java.io.*;
import java.lang.*;
import java.util.*;
```

```
public class Book_Lab3
```

```
{  
    public String name;  
    public String author;  
    public double price;  
    public double p no-of pages;
```

```
    public Lab_Programs(String n, String a,  
                        double p, int pages)
```

{

```
        name = n;
```

```
        author = a;
```

```
        price = p;
```

```
        no-of-pages = pages;
```

{

@Override

```
public String toString()
```

```
{ return "Name of book is: " + name +
```

```
           " Author of book is: "
```

```
+ author +
```

```
"Cost of the book is "
```

```
+ price +
```

```
"No of pages
```

```
is " + no-of-pages
```

Date

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

```
import java.io.*;
```

```
import java.lang.*;
```

```
public class ListBook3
```

```
{ public static String name;
```

```
public static String author;
```

```
public static double price;
```

```
public static int no_of_pages;
```

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

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

```
int n;
```

```
System.out.println("Enter the number of  
books");
```

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

```
book3[] ob = new book3[n];
```

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

```
{}
```

```
System.out.print("Enter the name  
of the book");
```

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

```
System.out.print("Enter the author  
of the book");
```

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

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

Date / /

```
price = sc.nextIntDouble();  
System.out.println("Enter the number of  
pages of book")
```

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

```
ob[i] = new Book3(name, author, price,  
no_of_pages);
```

{

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

```
System.out.println("Displaying the  
details of book")
```

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

{

#### OUTPUT:

1 Enter the number of books

2

3 Enter the name of book

4

5 Enter the author of book

6

Date

Enter the price of book 1  
500

Enter the number of pages of book 1  
400

Enter the name of book 2  
t

Enter the author of book 2  
t

Enter the price of book 2  
410

Enter the number of pages of book 2  
500

Displaying Details of book 1

Name of book is : h Author of book is : t  
cost of the book is : 500  
No of pages in book : 400

Display Details of book 2

Name of the book is : r Author of book is : t  
cost of the book is : ~~500~~ 410  
No of pages in book is : 500

## LAB - 6

## # Shapes program.

```

import java.io.*;
import java.lang.*;
import java.util.*;
abstract class Shape {
    int len, wid;
    Shape (int l, int w)
    {
        len = l;
        wid = w;
    }
    abstract void printArea();
}
class rectangle extends Shape {
    rectangle (int a, int b)
    {
        super (a, b);
    }
    void printArea()
    {
        System.out.println ("Area of Rectangle is " +
            (len * wid));
    }
}
class triangle extends Shape {
    triangle (int a, int b)
    {
        super (a, b);
    }
    void printArea()
    {
        System.out.println ("Area of the triangle");
    }
}

```

Date \_\_\_\_\_

```
is "+(len*wid)/2));
```

```
}
```

Class circle extends Shape

```
circle (int r1, int r2)
```

```
Super (r1, r2);
```

```
Void printArea()
```

```
System.out.println ("Area of the circle is "+  
(3.142 * len*len));
```

```
}
```

class test

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

```
Int l, b, rad;
```

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

```
System.out.println ("Enter the length/base of  
the rectangle/triangle respectively");
```

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

```
System.out.println ("Enter the breadth/height  
of the rectangle/triangle respectively");
```

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

```
System.out.println ("Enter the radius of  
the circle");
```

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

```
Shape s;
```

```
rectangle r = new rectangle (l, b);
```

```
triangle t = new triangle (l, b);
```

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

Date / /

$$S = 8;$$

S. print Area(); // Prints the area of the rectangle.

$$S = 4;$$

S. print Area(); // Prints the area of the triangle.

$$S = C;$$

S. print Area(); // Prints the area of the circle.

{ }

### OUTPUT

Enter the length/base of the rectangle/Tri  
angle respectively.

4

Enter the breadth/height of the rectangle/  
Triangle respectively.

4

Enter the radius of the circle.

4

Area of Rectangle is 16

Area of the Triangle is 8

Area of the circle is 50.272.

Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

## # Bank Programm

```
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 fine();  
    abstract void inter();
```

```
class curr_acc extends account
```

```
{  
    curr_acc (String n, String a, String t,  
              double b)  
{  
    super (n, a, t, b);
```

```
}  
    void fine()  
{
```

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

```
}  
    System.out.println ("you will be fined")
```

Date: / /

500 Rs 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("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 withdraw");  
sum = sc.nextDouble();  
balance = balance - sum;  
if (balance > 1000)  
display();  
else

Date / /

```
System.out.println("you cannot withdraw  
This much Amount");  
line()
```

```
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);
```

```
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 withdraw()
```

```
double sum;
```

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

```
System.out.println ("Enter the amount you
```

Date

```
want to withdraw");
System.out.println();
Sum = sc.nextDouble();
balance = balance - Sum;
display();
```

### Void deposit()

```
int Sum;
Scanner sc = new Scanner(System.in);
System.out.println("Enter the principal amount you want to submit");
Sum = sc.nextInt();
```

### Void inter()

```
double n, t;
double cpy = balance;
double interest;
Scanner sc = new Scanner(System.in);
System.out.println("Enter the Rate of interest");
n = sc.nextInt();
System.out.println("Enter the year of time Account has to be elapsed");
t = sc.nextInt();
System.out.println("Enter the period per year, when interest has to be calculated");
n = sc.nextInt();
balance = (balance) * (Math.pow((1 + (interest / 100)), t));
Interest = balance - cpy;
System.out.println("Interest Accumulated");
```

Date

In your Account is "t interest);  
display();  
System.out.println();

4 void fine ()

{

System.out.println("you have no Restriction on your minimum Balance Thankyou");  
System.out.println();

5

class test

{

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 minimum 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_ac (name, acc
                           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. fine();

break;

case 2;

a. deposit();

break;

case 3;

a. withdraw ();

break;

case 4;

System.exit (0);

break;

4

```

while (counter != 4);
break;

```

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case 2;

Sav-Acc s = new Sav-Acc(name, acc-num,  
type, bal);

a = s;

int cnr;

do

{

System.out.println("1; Deposit with  
Interest");

System.out.println("2; withdraw");

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

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

cnr = sc.nextInt();

switch(cnr)

{

case 1;

a.deposit();

break;

case 2;

a.withdraw();

break;

case 3;

System.exit(0);

break;

{

while(cnr != 3);

break;

case 3;

System.exit(0);

break;

g  
y

Date / /

Saath

## OUTPUT

Enter the name of the Account holder

Hari

Enter the Account Number

1bm19cs153

Enter the minimum balance in the account

2000

1 : current Account

2 : Saving Account

3 : Exit

Enter your choice

3

Enter the rate of

1 : Deposit

2 : withdraw

3 : Interest

4 : Exit

Enter your choice

1

Enter ~~your~~ the principle amount of you want to submit

500

Name of the Account Holder is Hari

Account Number of the Account holder

Current Account

Balance in your Account is 2500.

1 : Deposit

2 : withdraw

3 : Interest

4 : Exit

Enter your choice

3

Date \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Enter the rate of the interest

5

Enter the year of the time Account has to be  
clapped.

4

~~615153~~

Interest Accumulated In your Account is  
538.7656.

Name of the Account holder is Hari  
Account Number of the Account Holder  
is 1bm19cs153

Type of the Account of the Account Holder  
is current Account

Balance In your Account is 3038.7656

## WRITE A PROGRAM TO SOLVE THE QUADRATIC EQUATION

```
import java.io.*;
import java.util.*;
import java.lang.*;
public class quadratic
{
    private static double a;
    private static double b;
    private static double c;
    public static void read()
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the Co-Effcient a");
        a=sc.nextDouble();
        System.out.println("Enter the Co-Effcient b");
        b=sc.nextDouble();
        System.out.println("Enter the Co-Effcient c");
        c=sc.nextDouble();
        System.out.println("THANK YOU FOR ENTERRING THE CO-EFFICIENTS");
    }
    public static void calc()
    {
        read();
        double d=b*b-4*a*c;
        if(d>0)
        {
            System.out.println("ROOTS ARE REAL AND DISTINCT");
            System.out.println("FIRST ROOT IS " + (-b+Math.sqrt(d))/(2*a));
            System.out.println("SECOND ROOT IS " + (-b-Math.sqrt(d))/(2*a));
        }
    }
}
```

```

    }

    else if(d==0)
    {

        System.out.println("Roots are equal");

        System.out.println("ROOTS ARE " + (-b)/(2*a));

    }

    else

    {

        System.out.println("ROOTS ARE IMAGINARY");

        System.out.println("ROOTS ARE " + -b/(2*a) + "+" +"i" + (Math.sqrt(-d))/(2*a));

        System.out.println("ROOTS ARE " + -b/(2*a) + "-" +"i" + (Math.sqrt(-d))/(2*a));

    }

}

public static void main(String[] args)

{

    calc();

}

}

```

OUTPUT:

OUTPUT IS SHARED IN THE NEXT PAGE

```
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac quadratic.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java quadratic
Enter the Co-Efficient a
1
Enter the Co-Efficient b
-4
Enter the Co-Efficient c
4
THANK YOU FOR ENTERRING THE CO-EFFICIENTS
Roots are equal
ROOTS ARE 2.0

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac quadratic.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java quadratic
Enter the Co-Efficient a
4
Enter the Co-Efficient b
5
Enter the Co-Efficient c
5
THANK YOU FOR ENTERRING THE CO-EFFICIENTS
ROOTS ARE IMAGINARY
ROOTS ARE -0.625+10.78862474979798
ROOTS ARE -0.625-10.78862474979798

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac quadratic.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java quadratic
Enter the Co-Efficient a
4
Enter the Co-Efficient b
5
Enter the Co-Efficient c
1
THANK YOU FOR ENTERRING THE CO-EFFICIENTS
Roots are READ AND DISTINCT
FIRST ROOT IS -0.25
SECOND ROOT IS -1.0

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>
```

## WRITE A PROGRAM TO CALCULATE SGPA OF THE STUDENT

```
import java.io.*;
import java.lang.*;
import java.util.*;

public class lab2
{
    private static int n;
    private static String usn;
    private static String name;
    private static int credit[];
    private static double mark[];

    public static void read()
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the Number Of Subjects");
        n=sc.nextInt();
        credit=new int[n];
        mark=new double[n];
        System.out.println("Enter the name of the Student");
        name=sc.next();

        System.out.println("Enter the USN of The Student");
        usn=sc.next();

        System.out.println("Enter the Credits Of The Subject");
        for(int i=0;i<n;i++)
        {
            credit[i]=sc.nextInt();
        }
        System.out.println("Enter the Marks Of The Student In Corresponding Subjects");
```

```
for(int i=0;i<n;i++)
{
    mark[i]=sc.nextDouble();
}

public static int grade(double 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 Have Failed In This Subject");

    return 0;

}

}

public static double calculate()

{

    read();

    double sgpa;

    double sum_credits=0;

    double sum=0;

    int c;

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

    {

        c=grade(mark[i]);

        sum_credits+=credit[i];

        sum=sum+c*credit[i];

    }

    sgpa=(double)(sum/sum_credits);

    return sgpa;

}

public static void main(String[] args)

{

    Scanner sc=new Scanner(System.in);

    double sgpa=calculate();

    System.out.println("Name Of The Student is " + name);
```

```
System.out.println("SGPA OF THE STUDENT IS " + sgpa);  
}  
}
```

OUTPUT:

The screenshot shows a Microsoft Windows Command Prompt window titled 'Command Prompt'. The window displays the following text:

```
Microsoft Windows [Version 10.0.18362.1082]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Shreehari Kulkarni>set path=C:\Program Files\Java\jdk-14.0.2\bin

C:\Users\Shreehari Kulkarni>cd desktop
C:\Users\Shreehari Kulkarni\Desktop>d JAVA LAB PROGRAMS
C:\Users\Shreehari Kulkarni\Desktop>javac lab2.java
C:\Users\Shreehari Kulkarni\Desktop>java lab2
Enter the USN of The Student
153
Enter the Number Of Subjects
4
Enter the name of the Student
Hari
Enter the Credits Of The Subject
4
4
4
4
Enter the Marks Of The Student In Corresponding Subjects
95
99
99
85
Name Of The Student is Hari
SGPA OF THE STUDENT IS 9.45

C:\Users\Shreehari Kulkarni\Desktop>JAVA LAB PROGRAMS>
```

The window includes the standard Windows taskbar at the bottom with various icons and system status information.

## LAB PROGRAM

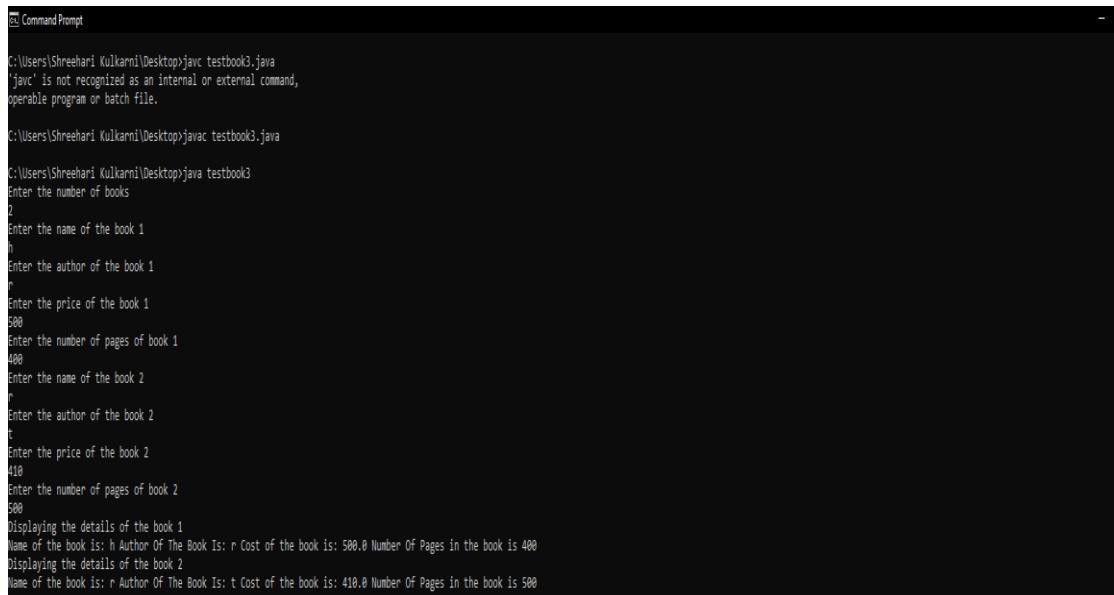
```
import java.io.*;
import java.lang.*;
import java.util.*;
public class book3
{
    public String name;
    public String author;
    public double price;
    public int no_of_pages;
    public book3(String n,String a,double pri,int pages)
    {
        name=n;
        author=a;
        price=pri;
        no_of_pages=pages;
    }
    @Override
    public String toString()
    {
        return "Name of the book is: " + name + " Author Of The Book Is: " + author + " Cost of the book
is: " + price + " Number Of Pages in the book is " + no_of_pages;
    }
}

import java.io.*;
import java.util.*;
import java.lang.*;
public class testbook3
{
```

```
public static String name;
public static String author;
public static double price;
public static int no_of_page;
public static void main(String[] args)
{
    Scanner sc=new Scanner(System.in);
    int n;
    System.out.println("Enter the number of books");
    n=sc.nextInt();
    book3[] ob=new book3[n];
    for(int i=0;i<n;i++)
    {
        System.out.println("Enter the name of the book " + (i+1));
        name=sc.next();
        System.out.println("Enter the author of the book " + (i+1));
        author=sc.next();
        System.out.println("Enter the price of the book " + (i+1));
        price=sc.nextDouble();
        System.out.println("Enter the number of pages of book " + (i+1));
        no_of_page=sc.nextInt();
        ob[i]= new book3(name,author,price,no_of_page);
        //ob[i]=new lab_program3(name,author,price,)
    }
    for(int i=0;i<n;i++)
    {
        System.out.println("Displaying the details of the book " + (i+1));
        //System.out.println();
        System.out.println(ob[i]);
    }
}
```

```
}
```

## OUTPUT



```
C:\Users\Shreehari Kulkarni\Desktop>javac testbook3.java
'javac' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Shreehari Kulkarni\Desktop>java testbook3
Enter the number of books
2
Enter the name of the book 1
h
Enter the author of the book 1
r
Enter the price of the book 1
500
Enter the number of pages of book 1
400
Enter the name of the book 2
t
Enter the author of the book 2
e
Enter the price of the book 2
410
Enter the number of pages of book 2
500
Displaying the details of the book 1
Name of the book is: h Author Of The Book Is: r Cost of the book is: 500.0 Number Of Pages in the book is 400
Displaying the details of the book 2
Name of the book is: t Author Of The Book Is: e Cost of the book is: 410.0 Number Of Pages in the book is 500
```

## EXTRA PROGRAM1:

```
import java.io.*;
import java.lang.*;
import java.util.*;

public class extra7
{
    public static String empid;
    public static String empname;
    public static double emphrs;
    public static double empbas;
    public static double emphra;
    public static double empda;
    public static double empit;
    public static double empgross;
    public static void read()
```

```
{  
Scanner sc=new Scanner(System.in);  
System.out.println("Enter the id of the employee");  
empid=sc.nextInt();  
System.out.println("Enter the name of the employee");  
empname=sc.next();  
System.out.println("Enter the number of hours an employee works in minutes");  
emphrs=sc.nextDouble();  
System.out.println("Enter the basic salary of the employee");  
empbas=sc.nextDouble();  
System.out.println("Enter thehra of the employee in percent");  
emphra=sc.nextDouble();  
System.out.println("Enter the da of the employee in percent");  
empda=sc.nextDouble();  
System.out.println("Enter the it of the employee");  
empit=sc.nextDouble();  
}  
  
public static double calc()  
{  
    read();  
    double time=0;  
    double i_d=0;  
    empgross=empbas+(empbas*emphra)/(100);  
    if(emphrs>200)  
    {  
        time=emphrs-200;  
        time=time/60;  
        System.out.println("Employee is eligible for Additional Payment");  
        i_d=time*100;  
        System.out.println("ADDITIONAL SALARY IS: " + i_d);  
        empgross=empgross+i_d;  
    }  
}
```

```

    }
else
{
    time=200-emphrs;
    time=time/60;
    System.out.println("Your Salary Will Be Cut If You Don't Perform Atleast 200 Minutes of
work");
    i_d=time*100;
    System.out.println("DECREASED SALARY IS: " + i_d);
    empgross=empgross-i_d;
}
return empgross;
}

public static void main(String[] args)
{
    double salary=calc();
    System.out.println("Name of the employee is " + empname);
    System.out.println("Id of the employee is " + empid);
    System.out.println("Basic Salary of the employee is " + empbas);
    System.out.println("Final Salary of the employee is " + salary);
}
}

```

## OUTPUT

IS SHARED IN THE NEXT PAGE:

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0-19041.572]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\Shreeshari_Kulkarni>set path="C:\Program Files\Java\jdk-14.0.2\bin"
C:\Users\Shreeshari_Kulkarni>cd JAVA\LABPROGRAMS
C:\Users\Shreeshari_Kulkarni\Desktop>javac extra7.java
C:\Users\Shreeshari_Kulkarni\Desktop\JAVA\LABPROGRAMS>java extra7
Enter the id of the employee
1BM9CS153
Enter the name of the employee
KULKARNI
Enter the number of hours an employee works in minutes
180
Enter the basic salary of the employee
40000
Enter thehra of the employee in percent
5
Enter the da of the employee in percent
5
Enter the it of the employee
5
Employee is eligible For Additional Payment
ADDITIONAL SALARY IS: 333.3333333333337
Name of the employee is KULKARNI
Id of the employee is 1BM9CS153
Basic Salary of the employee is 40000.0
Final Salary of the employee is 42333.33333333336

C:\Users\Shreeshari_Kulkarni\Desktop\JAVA\LABPROGRAMS>javac extra8.java
C:\Users\Shreeshari_Kulkarni\Desktop\JAVA\LABPROGRAMS>java extra8
Enter the id of the employee
1BM9CS153
Enter the name of the employee
KULKARNI
Enter the number of hours an employee works in minutes
180
Enter the basic salary of the employee
40000
Enter thehra of the employee in percent
5
Enter the da of the employee in percent
5
Enter the it of the employee
5
Your Salary Will Be Cut If You Don't Perform Atleast 200 Minutes of work
DECREASED SALARY IS: 33.33333333333333
Name of the employee is KULKARNI
Id of the employee is 1BM9CS153
Basic Salary of the employee is 40000.0
Final Salary of the employee is 41966.666666666664

C:\Users\Shreeshari_Kulkarni\Desktop\JAVA\LABPROGRAMS>

```

## EXTRA 2:

```

import java.util.*;
import java.io.*;
import java.lang.*;
public class extra8
{
    public int years;
    public int months;
    public String name;
}
class age
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        extra8[] ob=new extra8[2];
    }
}

```

```
ob[0]=new extra8();
ob[1]=new extra8();
for(int i=0;i<2;i++)
{
    System.out.println("Enter the name of the person " + (i+1));
    ob[i].name=sc.next();
    System.out.println("Enter the number of years a person is old " + (i+1));
    ob[i].years=sc.nextInt();
    ob[i].years=ob[i].years*12;
    System.out.println("Enter the Number of months " + (i+1));
    ob[i].months=sc.nextInt();
}
double sum1=ob[0].years+ob[0].months;
System.out.println("Total Age of the Person " + " 1 " + " in Months is " + sum1);
System.out.println();
double sum2=ob[1].years+ob[1].months;
System.out.println("Total Age of the person 2 " + " in months is " + sum2);
System.out.println();
System.out.println("Displaying the details of the person with greater age ");
System.out.println();
if(sum1>sum2)
{
    display(ob[0]);
}
else
{
    display(ob[1]);
}
}

public static void display(extra8 ob)
```

```
{  
    System.out.println("Name of the person is " + ob.name);  
    System.out.println("Age in years is " + ob.years/12);  
    System.out.println("Number of months of person is " + ob.months);  
}  
}
```

## OUTPUT:

The screenshot shows a Windows Command Prompt window titled 'Command Prompt'. The path is 'C:\Users\Shreeshari Kulkarni\Desktop\JAVALABPROGRAMS>'. The user runs 'javac extra8.java' and then 'java age'. They input 'Harsh' for the name of person 1, '18' for their age in years, and '5' for the number of months. For person 2, they input 'Subhas', '2', and '2'. The program calculates the total age in months for both individuals and displays the details of the person with the greater age. The output is as follows:

```
C:\Users\Shreeshari Kulkarni\Desktop\JAVALABPROGRAMS>javac extra8.java  
C:\Users\Shreeshari Kulkarni\Desktop\JAVALABPROGRAMS>java age  
Enter the name of the person 1  
Harsh  
Enter the number of years a person is old 1  
18  
Enter the Number of months 1  
Enter the name of the person 2  
Subhas  
Enter the number of years a person is old 2  
2  
Enter the Number of months 2  
2  
Total Age of the Person 1 in Months is 221.0  
Total Age of the person 2 in months is 218.0  
Displaying the details of the person with greater age  
Name of the person is Harsh  
Age in years is 18  
Number of months of person is 5  
C:\Users\Shreeshari Kulkarni\Desktop\JAVALABPROGRAMS>
```

Program to Calculate Area of triangle ,Rectangle,circle using abstract class

```
import java.io.*;
import java.lang.*;
import java.util.*;

abstract class shape{
```

```
    int len,wid;
```

```
    shape(int l,int w)
```

```
{
```

```
    len=l;
```

```
    wid=w;
```

```
}
```

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

```
}
```

```
class rectangle extends shape
```

```
{
```

```
    rectangle(int a,int b)
```

```
{
```

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

```
}
```

```
    void printArea()
```

```
{
```

```
        System.out.println("Area Of Rectangle is " + (len*wid));
```

```
}
```

```
}
```

```
class triangle extends shape
{
    triangle(int a,int b)
    {
        super(a,b);
    }

    void printArea()
    {
        System.out.println("Area Of The Traingle Is " + ((len*wid)/2));
    }
}

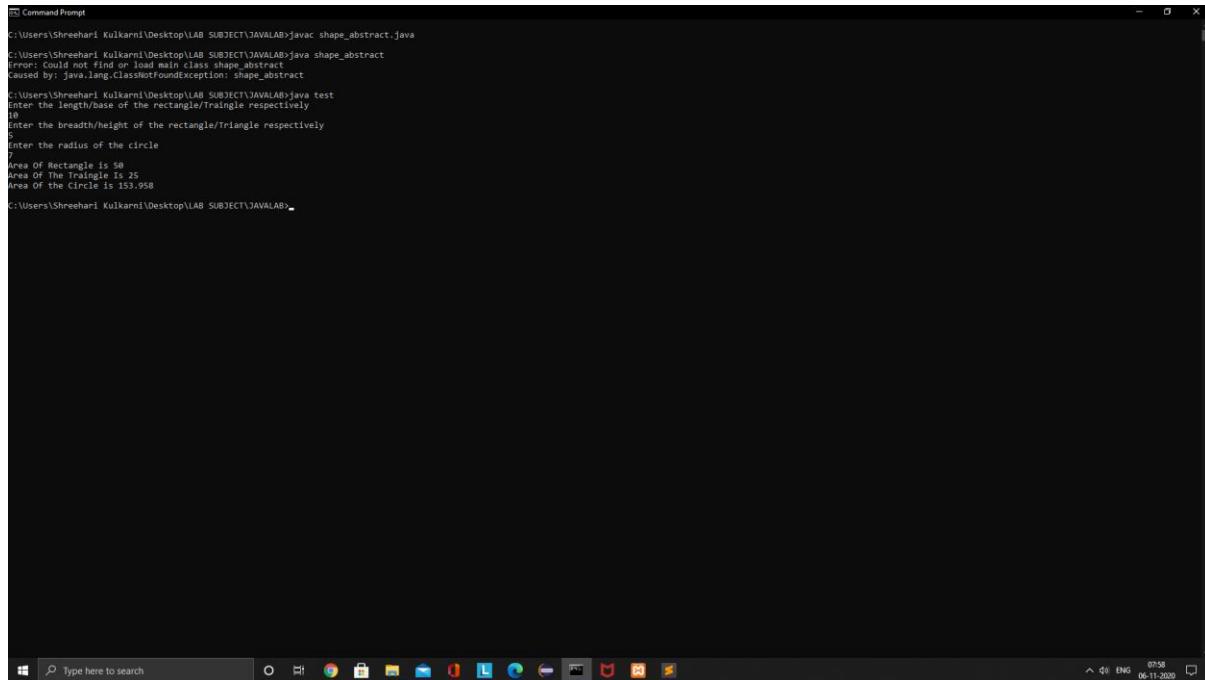
class circle extends shape
{
    circle(int r1,int r2)
    {
        super(r1,r2);
    }

    void printArea()
    {
        System.out.println("Area Of the Circle is " + (3.142*len*len));
    }
}

class test
{
    public static void main(String[] args)
    {
        int l,b,rad;
```

```
Scanner sc=new Scanner(System.in);
System.out.println("Enter the length/base of the rectangle/Triangle respectively ");
l=sc.nextInt();
System.out.println("Enter the breadth/height of the rectangle/Triangle respectively ");
");
b=sc.nextInt();
System.out.println("Enter the radius of the circle ");
rad=sc.nextInt();
shape s;
rectangle r=new rectangle(l,b);
triangle t=new triangle(l,b);
circle c=new circle(rad,rad);
s=r;
s.printArea(); //prints the area of the rectangle
s=t;
s.printArea(); //prints the area of the triangle
s=c;
s.printArea(); //prints the area of the circle
}
}
```

## Output



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The command `javac shape\_abstract.java` is run, followed by `java shape\_abstract`, which results in a `java.lang.ClassNotFoundException`. Then, `java test` is run, prompting for rectangle/triangle dimensions. Finally, the areas of a rectangle (50), triangle (25), and circle (153.958) are displayed.

```
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVA\LAB>javac shape_abstract.java
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVA\LAB>java shape_abstract
java: Could not find or load main class shape_abstract
Caused by: java.lang.ClassNotFoundException: shape_abstract
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVA\LAB>java test
Enter the length/base of the rectangle/triangle respectively
10
Enter the breadth/height of the rectangle/triangle respectively
5
Enter the radius of the circle
7
Area Of Rectangle is 50
Area Of The Triangle Is 25
Area Of The Circle Is 153.958
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVA\LAB>
```

## 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 fine();
    abstract void inter();
}

class curr_acc extends account
{
    curr_acc(String n,String a,String t,double b)
    {
        super(n,a,t,b);
    }

    void fine()
    {
        if(balance<1000)
        {
            System.out.println("You Will 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 od 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=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=balance-sum;
    if(balance>1000)
    {
        display();
    }
}
```

```
        else
        {
            System.out.println("You Cannot Withdraw This Much Amount ");
            fine();
        }
    }

    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);
        System.out.println();
        System.out.println("Account Number of the Account Holder is " + acc_no);
        System.out.println();
        System.out.println("Type Of the Account of the Account Holder is " + type);
        System.out.println();
        System.out.println("Balance In Your Account is " + balance);
        System.out.println();
    }
}
```

```
void withdraw()
{
    double sum;
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the amount You Want To Withdraw ");
    System.out.println();
    sum=sc.nextDouble();
    balance=balance-sum;
    display();
}
```

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

```
void inter()
{
    double r,t;
    double interest;
    double amount;
    double 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 Accumalted In Your Account is " + interest);

display();

System.out.println();

}

void fine()

{

System.out.println("You Have No Restriction On Your Minimum Balance Thank You!");

};

System.out.println();

}

class test

{

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 Minimum Balance in the account ");
bal=sc.nextDouble();

System.out.println();

System.out.println("1: Current Account ");
System.out.println("2: Savings Account ");
System.out.println("3: Exit");

System.out.println();

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();
            System.out.println("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(0);
                break;
        }
    }while(counter!=4);

    break;

    case 2:
        sav_acc s=new sav_acc(name,acc_num,typ,bal);
        a=s;
        int cnr;
        do
        {
```

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

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

System.out.println("3: Interest");

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

System.out.println();

System.out.println("Enter Your Choice ");

cnr=sc.nextInt();

switch(cnr)

{

    case 1:

        a.deposit();

        break;

    case 2:

        a.withdraw();

        break;

    case 3:

        a.inter();

    case 4:

        System.exit(0);

        break;

}

}while(cnr!=5);

break;

case 3:
```

```
        System.exit(0);

    break;

}

}

}

}
```

## Output

```
Command Prompt - java test
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVA LAB>java bank.java
Enter the name of the account holder
Hari
Enter the Account Number
IBMI9CS153
Enter the Minimum Balance in the account
2000
1: Current Account
2: Savings Account
3: Exit
Enter your choice
1
1: Deposit
2: Withdraw
3: Interest
4: Exit
Enter Your Choice
1
Enter the principal amount you want to submit
500
Name Of the Account Holder is Hari
Account Number of the Account Holder is IBMI9CS153
Type of the Account of the Account Holder is Current Account
Balance In Your Account is 2500.0
1: Deposit
2: Withdraw
3: Interest
4: Exit
Enter Your Choice
```