

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-EFFCIENTS");
    }

    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("FIRST 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 ENTERING 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
4
THANK YOU FOR ENTERING THE CO-EFFICIENTS
ROOTS ARE IMAGINARY
ROOTS ARE -0.625+10.7886247497997998i
ROOTS ARE -0.625-10.7886247497997998i

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 ENTERING THE CO-EFFICIENTS
ROOTS ARE REAL AND DISTINCT
FIRST ROOT IS -0.25
FIRST 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 caccluate()
{
    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;
}

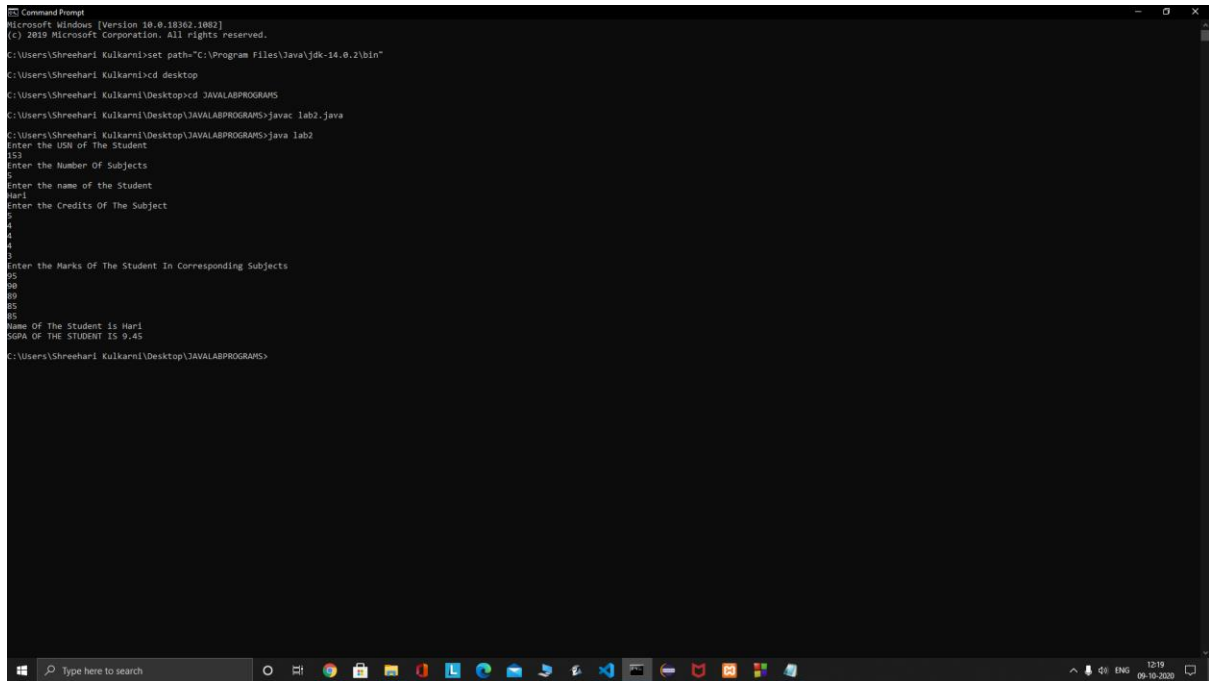
public static void main(String[] args)
{
    Scanner sc=new Scanner(System.in);

    double sgpa=caccluate();
    System.out.println("Name Of The Student is " + name);
}

```

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

OUTPUT:



```
Microsoft Windows [Version 10.0.18362.1002]  
(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>cd JAVALABPROGRAMS  
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac lab2.java  
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java lab2  
Enter the USN of The Student  
153  
Enter the Number Of Subjects  
5  
Enter the name of the Student  
Hari  
Enter the Credits Of The Subject  
4  
4  
4  
4  
3  
Enter the Marks Of The Student In Corresponding Subjects  
95  
90  
80  
85  
80  
Name Of The Student Is Hari  
SGPA OF THE STUDENT IS 9.45  
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>
```

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

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

C:\Users\Shreehari Kulkarni\Desktop>javac testbook3.java

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
t
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: t 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.next();
    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 the hra 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:

```
Microsoft Windows [Version 10.0.19041.572]
(c) 2020 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>cd JAVALABPROGRAMS
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac extra7.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java extra7
Enter the id of the employee
18M19CS153
Enter the name of the employee
HARI
Enter the number of hours an employee works in minutes
108
Enter the basic salary of the employee
40000
Enter the hra of the employee in percent
5
Enter the da of the employee in percent
5
Enter the it of the employee
7
Employee is eligible for Additional Payment
ADDITIONAL SALARY IS: 33.333333333333
Name of the employee is HARI
Id of the employee is 18M19CS153
Basic Salary of the employee is 40000.0
Final Salary of the employee is 42333.33333333336
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac extra7.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java extra7
Enter the id of the employee
18M19CS153
Enter the name of the employee
KULKARNI
Enter the number of hours an employee works in minutes
108
Enter the basic salary of the employee
40000
Enter the hra of the employee in percent
5
Enter the da of the employee in percent
4
Enter the it of the employee
6
Your Salary Will Be Cut If You Don't Perform Atleast 200 Minutes of work
DECREASED SALARY IS: 33.333333333333
Name of the employee is KULKARNI
Id of the employee is 18M19CS153
Basic Salary of the employee is 40000.0
Final Salary of the employee is 41966.66666666664
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>
```

EXTRA 2:

```
import java.util.*;

import java.io.*;

import java.lang.*;

public class extra2

{

    public int years;

    public int months;

    public String name;

}

class age

{

    public static void main(String[] args)

    {

        Scanner sc=new Scanner(System.in);

        extra2[] ob=new extra2[2];
```

```

ob[0]=new extra8();
ob[1]=new extra8();
for(int i=0;i<2;i++)
{
    System.out.println("Enter the name of the perosn " + (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)

```

```

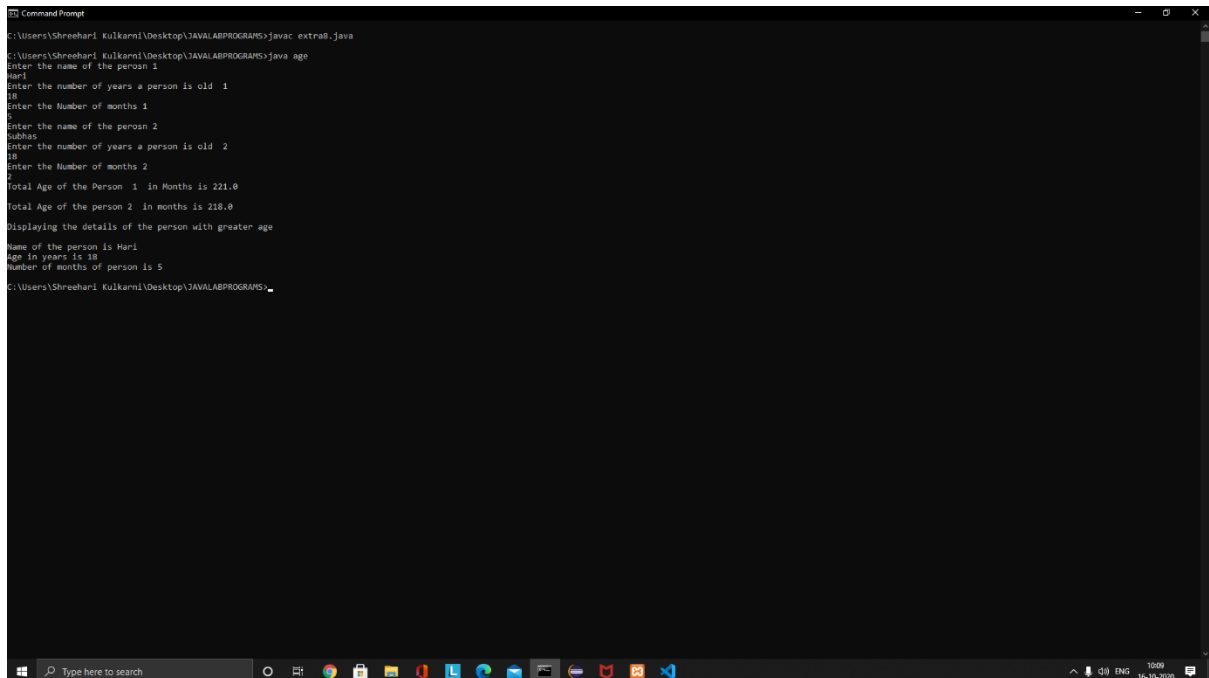
{
    System.out.println("Name of the person is " + ob.name);

    System.out.println("Age in years is " + ob.years/12);

    System.out.println("Number of months of person is " + ob.months);
}
}

```

OUTPUT:



```

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac extra8.java
C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java age
Enter the name of the person 1
Hari
Enter the number of years a person is old 1
18
Enter the Number of months 1
5
Enter the name of the person 2
Sudhas
Enter the number of years a person is old 2
18
Enter the Number of months 2
5
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 Hari
Age in years is 18
Number of months of person is 5
C:\Users\Shreehari 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/Traingle 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

```
Command Prompt
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVALAB>javac shape_abstract.java
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVALAB>java shape_abstract
Error: Could not find or load main class shape_abstract
Caused by: java.lang.ClassNotFoundException: shape_abstract
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVALAB>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\JAVALAB>
```

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\JAVALAB>javac bank.java
C:\Users\Shreehari Kulkarni\Desktop\LAB SUBJECT\JAVALAB>java test
Enter the name of the account holder
Hari
Enter the Account Number
18M19CS153
Enter the Minimum Balance in the account
2500
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 18M19CS153
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

```