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-Effcient a
1
Enter the Co-Effcient b
-4
Enter the Co-Effcient c
4
THANK YOU FOR ENTERRING THE CO-EFFCIENTS
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-Effcient a
4
Enter the Co-Effcient b
5
Enter the Co-Effcient c
4
THANK YOU FOR ENTERRING THE CO-EFFCIENTS
ROOTS ARE IMAGINARY
ROOTS ARE -0.625+i0.7806247497997998
ROOTS ARE -0.625-i0.7806247497997998

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>javac quadratic.java

C:\Users\Shreehari Kulkarni\Desktop\JAVALABPROGRAMS>java quadratic
Enter the Co-Effcient a
4
Enter the Co-Effcient b
5
Enter the Co-Effcient c
1
THANK YOU FOR ENTERRING THE CO-EFFCIENTS
ROOTS ARE READ 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;
```

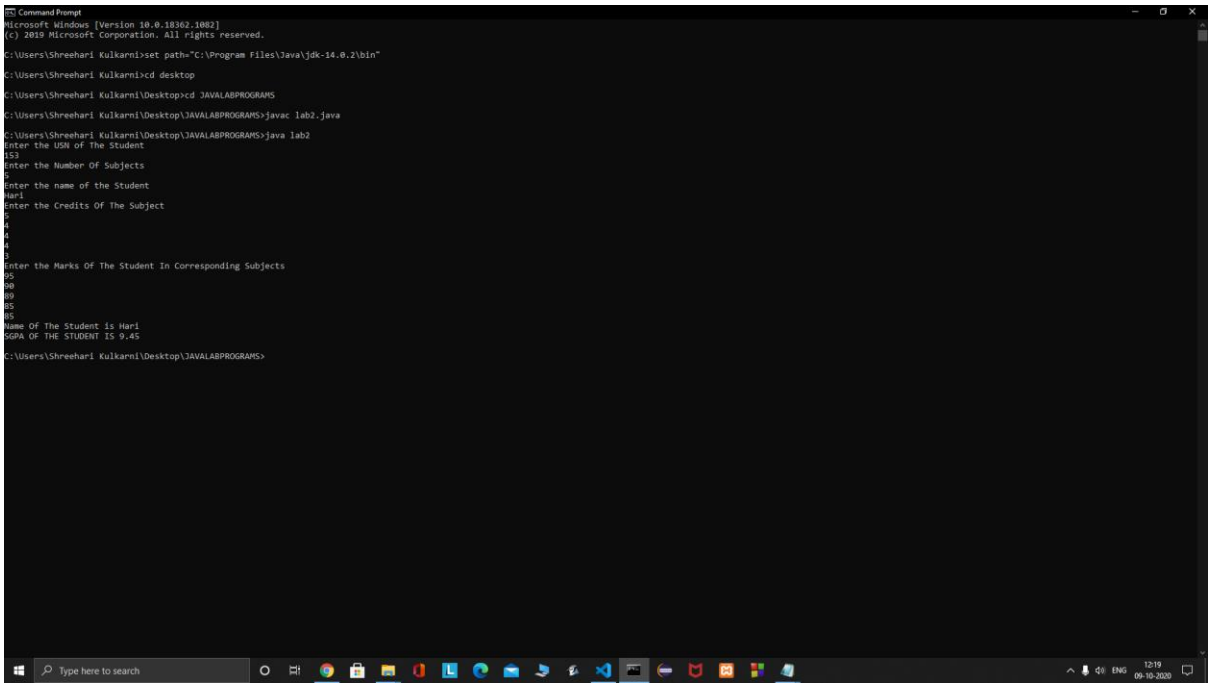
```
    }
    else
    {
        System.out.println("You Have Failed In This Subject");
        return 0;
    }
}

public static double caclculate()
{
    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=caclculate();
    System.out.println("Name Of The Student is " + name);
```

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

OUTPUT:



LAB PROGRAM

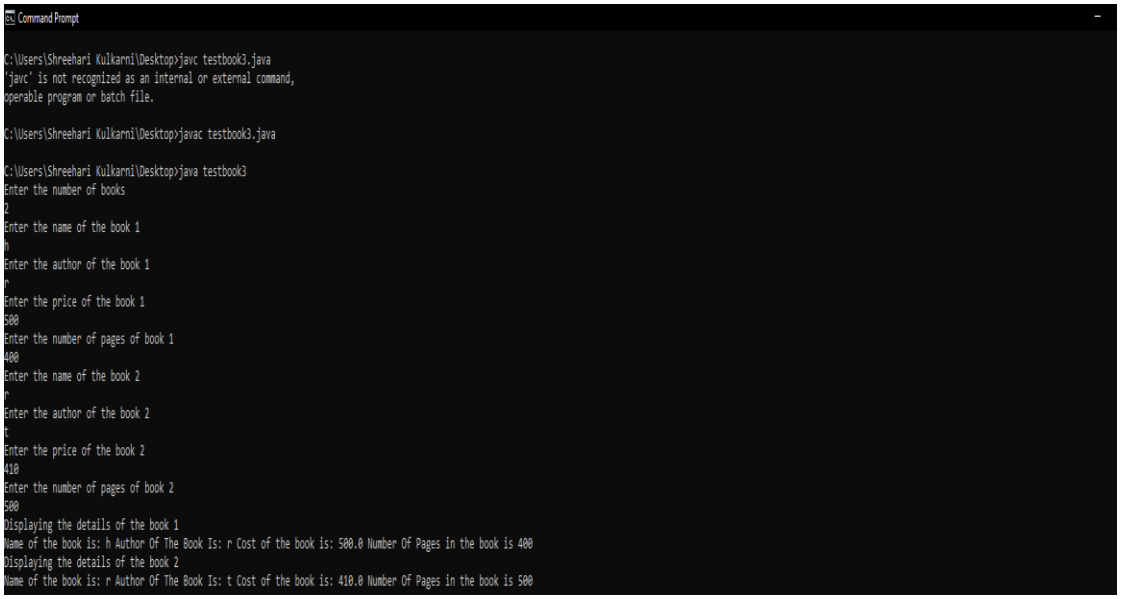
```
import java.io.*;
import java.lang.*;
import java.util.*;
public class book3
{
   public String name;
   public String author;
   public double price;
   public int no_of_pages;
   public book3(String n,String a,double pri,int pages)
   {
      name=n;
      author=a;
      price=pri;
      no_of_pages=pages;
   }
   @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



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 elgible 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

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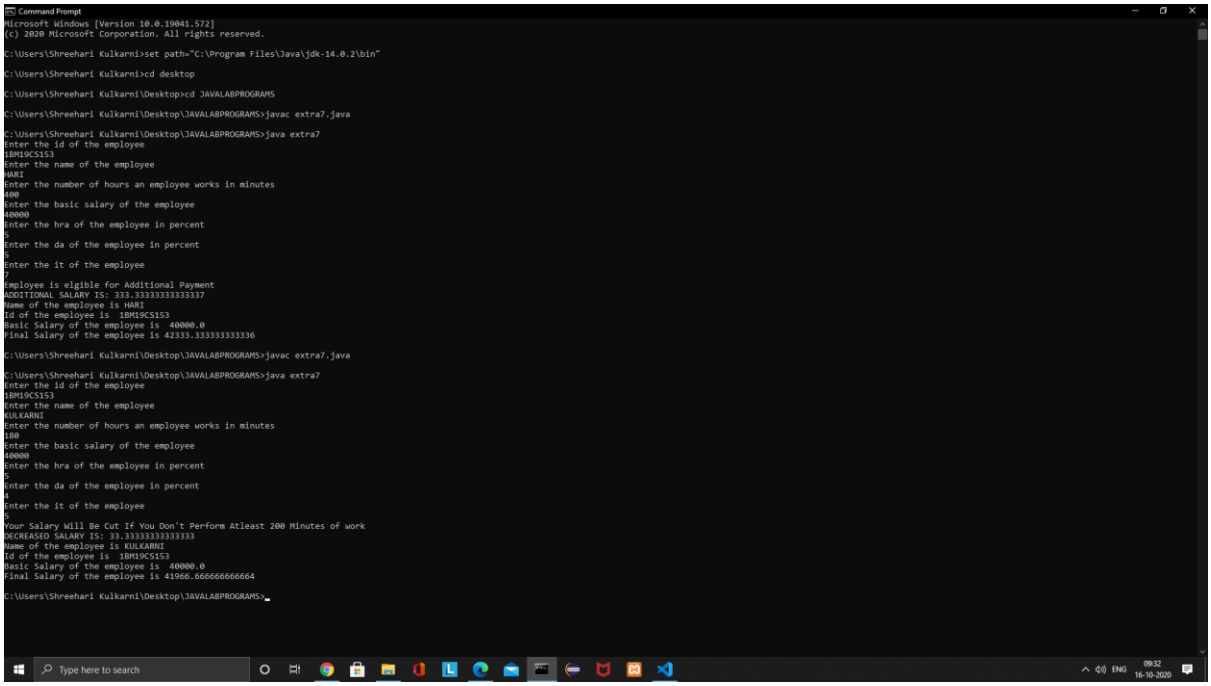


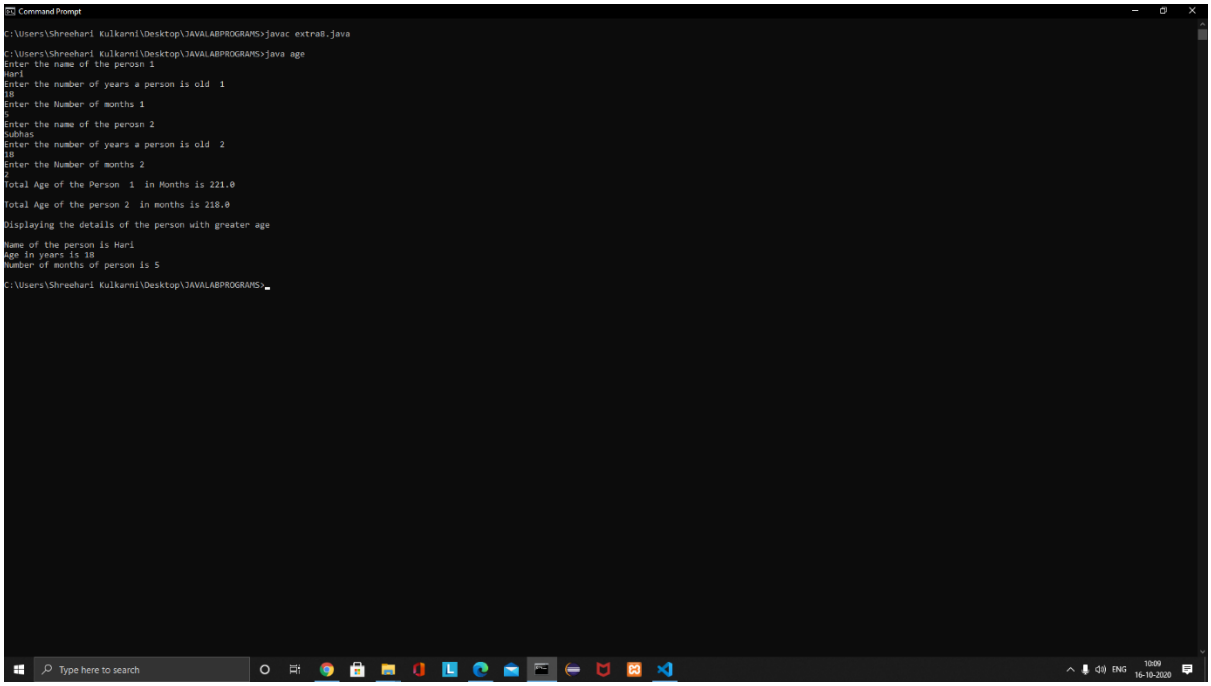
EXTRA 2:

```
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 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:



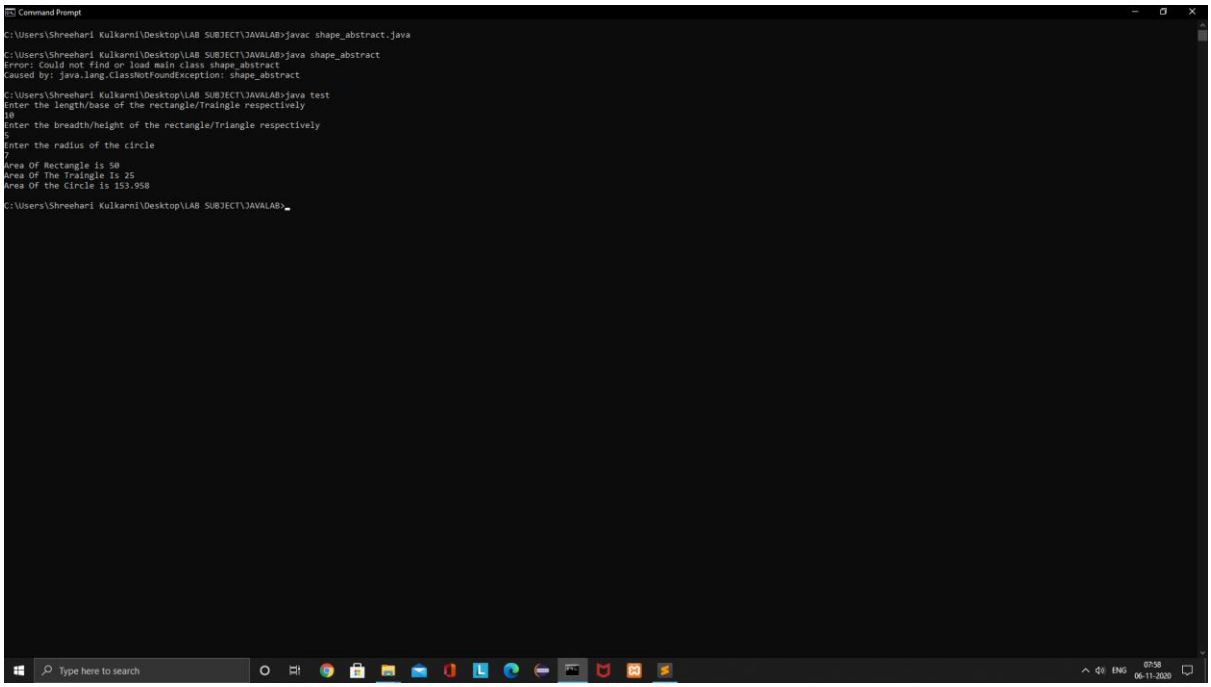
Program to Calculate Area of triangle ,Rectangle,circle using abstract class

```
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



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 Elgible 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