

School of Information Technology & Engineering

Winter Semester 2021-2022

ITA5004 – Object Oriented Programming using JAVA

DIGITAL ASSIGNMENT LAB-02

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SLOT:L3+L4

1.A class called Circle is designed as given below. It contains one private instance variable: radius (of type double). Two constructors, Two public methods: getRadius() and findArea().Define the main class and test the program.

PROGRAM:

```
class Circle
{
    private double radius;

    Circle()
    {
        System.out.println("In default constructor");
        radius = 0;
    }

    Circle(double r)
    {
        System.out.println("In parameterized constructor");
        radius = r;
    }

    public double getRadius()
    {
        return radius;
    }

    public double getArea()
    {
```

```

return 3.14*radius*radius;
}
}
class Ans1 {
public static void main(String [] args)
{
Circle c1= new Circle();
Circle c2 = new Circle(4);
System.out.println("C1.radius=" + c1.getRadius());
System.out.println("C1.area= " + c1.getArea());
System.out.println("C2.radius = "+ c2.getRadius());
System.out.println("C2.areal = "+ c2.getArea());
}
}

```

OUTPUT:

```

C:\Users\PRIYA\Downloads>javac Ans1.java
C:\Users\PRIYA\Downloads>java Ans1
In default constructor
In parameterized constructor
C1.radius=0.0
C1.area= 0.0
C2.radius = 4.0
C2.areal = 50.24
C:\Users\PRIYA\Downloads>

```

2. Create a Line class with 2 points (say, x and y) as data members. Write suitable constructors. Write a method to compute the length of the line. Use the formula

Length =
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

PROGRAM.

```
import java.lang.*;

class Line {
    double x, y;
    Line(double a, double b)
    {
        x = a;
        y = b;
        System.out.println("x = "+x+", y = "+y);
    }
    double distance (Line l)
    {
        double a=Math.pow(x-l.x, 2);
        double b= Math.pow(y-l.y, 2);
        return Math.sqrt(a+b);
    }
}

class Pro2
{
    public static void main(String args[])
    {
        Line l1 = new Line(6,6);
        Line l2 = new Line(3,3);
        System.out.println("Distance = "+l1.distance (l2));
    }
}
```

OUTPUT:

```
Command Prompt
C:\Users\PRIYA\Downloads>javac Pro2.java
C:\Users\PRIYA\Downloads>java Pro2
x = 6.0, y = 6.0
x = 3.0, y = 3.0
Distance = 4.242640687119285
C:\Users\PRIYA\Downloads>
```

3. Develop a Java application to generate Electricity bills. Create a class with the following members: Consumer no., consumer name, previous month reading, current month reading, type of EB connection (i.e. domestic or commercial). Compute the bill amount using the following tariff. If the type of the EB connection is domestic, calculate the amount to be paid as follows:

- First 100 units - Rs. 1 per unit
- 101-200 units - Rs. 2.50 per unit
- 201 -500 units - Rs. 4 per unit
- > 501 units - Rs. 6 per unit

If the type of the EB connection is commercial, calculate the amount to be paid as follows:

- First 100 units - Rs. 2 per unit
- 101-200 units - Rs. 4.50 per unit
- 201 -500 units - Rs. 6 per unit
- > 501 units - Rs. 7 per unit

PROGRAM:

```
import java.util.*;

class ans3
{
    public static void main (String args[])
    {
        customerdata ob = new customerdata();
        ob.getdata();
        ob.calc();
    }
}
```

```

ob.display();
}
}
class customerdata
{
Scanner in = new Scanner(System.in);
Scanner ins = new Scanner(System.in);
String cname,type;
int bn;
double current,previous,tbill,units;
void getdata()
{
System.out.print ("\n\t Enter consumer number ");
bn = in.nextInt();
System.out.print ("\n\t Enter Type of connection (D for Domestic or C for Commercial) ");
type = ins.nextLine();
System.out.print ("\n\t Enter consumer name ");
cname = ins.nextLine();
System.out.print ("\n\t Enter previous month reading ");
previous= in.nextDouble();
System.out.print ("\n\t Enter current month reading ");
current= in.nextDouble();
}
void calc()
{
units=current-previous;
if(type.equals("D"))
{
if (units<=100)
tbill=1 * units;
else if (units>100 && units<=200)
tbill=2.50*units;
else if (units>200 && units<=500)

```

```

tbill= 4*units;
else
tbill= 6*units;
}
else
{
if (units<=100)
tbill= 2 * units;
else if(units>100 && units<=200)
tbill=4.50*units;
else if(units>200 && units<=500)
tbill= 6*units;
else
tbill= 7*units;
}
}
void display()
{
System.out.println("\n\t Consumer number = "+bn);
System.out.println ("\n\t Consumer name = "+cname);
if(type.equals("D"))
System.out.println ("\n\t type of connection = DOMESTIC ");
else
System.out.println ("\n\t type of connection = COMMERCIAL ");
System.out.println ("\n\t Current Month  Reading = "+current);
System.out.println ("\n\t Previous Month  Reading = "+previous);
System.out.println ("\n\t Total units = "+units);
System.out.println ("\n\t Total bill = RS "+tbill);
}
}

```

OUTPUT:

```
Command Prompt
C:\Users\PRIYA\Downloads>java ans3

Enter consumer number 1234567859

Enter Type of connection (D for Domestic or C for Commercial) domestic

Enter consumer name priyadharshini.r

Enter previous month reading 700.0

Enter current month reading 600.0

Consumer number = 1234567859

Consumer name = priyadharshini.r

type of connection = COMMERCIAL

Current Month Reading = 600.0

Previous Month Reading = 700.0

Total units = -100.0

Total bill = RS -200.0
```

4. Define a class 'Student_Results' with the following attributes: Reg.No, Name, branch & CGPA. You have to define appropriate constructors and methods. A Software company directly calls the first two toppers for the HR round in each branch. Write a Java program to display the shortlisted students' details.

CODE:

```
import java.util.Scanner;

class Student_Results
{
    int regno;
    String Name,Branch;
    double CGPA;
    Student_Results()
    {
    }
    void input()
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter your registration no :");
        regno=sc.nextInt();
        sc.nextLine();
        System.out.println("Enter your name :");
        Name=sc.nextLine();
    }
}
```

```

System.out.println("Enter your Branch :");
Branch=sc.nextLine();
System.out.println("Enter your CGPA :");
CGPA=sc.nextDouble();
}
void display()
{
System.out.println("\nName="+Name+"\nRegistrationnumber="+regno+"\nBranch="+Branch+"\nCG
PA="+CGPA);
}
}
public class Ans4{
public static void main(String[] args) {
Scanner sc=new Scanner(System.in);
System.out.println("Enter number of Students :");
int n=sc.nextInt();
Student_Results s[]=new Student_Results[n];
for(int i=0;i<n;i++)
{ s[i]=new Student_Results();
s[i].input();
}
Student_Results temp;
for(int i=0;i<n;i++)
{
for(int j=i+1;j<n;j++)
{
if(s[i].CGPA < s[j].CGPA)
{
temp=s[i];
s[i]=s[j];
s[j]=temp;
}
}
}
}

```



```

}

System.out.println("Shortlisted students are:");

s[0].display();

s[1].display();

}

}

```

```

C:\Users\PRIYA\Downloads>java Ans4
Enter number of Students :
3
Enter your registration no :
32
Enter your name :
priyadharshini
Enter your Branch :
mca
Enter your CGPA :
8.9
Enter your registration no :
33
Enter your name :
sindhu
Enter your Branch :
mca
Enter your CGPA :
9
Enter your registration no :
90
Enter your name :
disha
Enter your Branch :
mca
Enter your CGPA :

```

```

mca
Enter your CGPA :
8.9
Enter your registration no :
33
Enter your name :
sindhu
Enter your Branch :
mca
Enter your CGPA :
9
Enter your registration no :
90
Enter your name :
disha
Enter your Branch :
mca
Enter your CGPA :
8
Shortlisted students are:

Name=sindhu
Registrationnumber=33
Branch=mca
CGPA=9.0

Name=priyadharshini

```

```
Command Prompt
sindhu
Enter your Branch :
mca
Enter your CGPA :
9
Enter your registration no :
90
Enter your name :
disha
Enter your Branch :
mca
Enter your CGPA :
8
Shortlisted students are:

Name=sindhu
Registrationnumber=33
Branch=mca
CGPA=9.0

Name=priyadharshini
Registrationnumber=32
Branch=mca
CGPA=8.9

C:\Users\PRIYA\Downloads>
```

5. A group of 'n' candidates has applied for faculty recruitment. Their Name, qualification, experience, dob and gender are stored in a class "Recruitment". Write a java program to sort the objects based on their experience and display their details. If the experience is equal, use the name as the second sorting criteria.

CODE:

```
import java.util.*;

class candidate
{
    String name,quali,dob,g;
    int ex;

    void getdata()
    {
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter your name:");
        name=sc.nextLine();
        System.out.println("Enter your qualification:");
        quali=sc.nextLine();
        System.out.println("Enter your dob:");
        dob=sc.nextLine();
        System.out.println("Enter your gender:");
        g=sc.nextLine();
        System.out.println("Enter your experience:");
```

```

ex=sc.nextInt();
}
void sort(candidate c[])
{
candidate temp;
for(int i=0;i<2;i++)
{
for(int j=i+1;j<3;j++)
{
if(c[i].ex < c[j].ex)
{
temp=c[i];
c[i]=c[j];
c[j]=temp;
}
else if(c[i].ex==c[j].ex)
{
if(c[i].name.compareTo(c[j].name) < 0)
{
temp=c[i];
c[i]=c[j];
c[j]=temp;
}
}
}
}
}
void display()
{
System.out.println("Name="+name);
System.out.println("Qualification="+quali);
System.out.println("Date of birth="+dob);
System.out.println("Gender="+g);
}
}

```

```
System.out.println("Experience="+ex);
}
}
public class Ans5 {
public static void main(String[] args) {
candidate c[]=new candidate[10];
candidate c1=new candidate();
for(int i=0;i<10;i++)
{
c[i]=new candidate();
}
for(int i=0;i<3;i++)
{
c[i].getdata();
}
c1.sort(c);
for(int i=0;i<3;i++)
{
c[i].display();
}
}
}
```

OUTPUT:

```
Command Prompt
C:\Users\PRIYA\Downloads>javac Ans5.java

C:\Users\PRIYA\Downloads>java Ans5
Enter your name:
priyadharshini.r
Enter your qualification:
mca
Enter your dob:
30-08-2000
Enter your gender:
female
Enter your experience:
4
Enter your name:
sindhu
Enter your qualification:
mca
Enter your dob:
9-11-2000
Enter your gender:
female
Enter your experience:
3
Enter your name:
disha
Enter your qualification:
bca

3
Enter your name:
disha
Enter your qualification:
bca
Enter your dob:
4-09-2000
Enter your gender:
female
Enter your experience:
2
Name=priyadharshini.r
Qualification=mca
Date of birth=30-08-2000
Gender=female
Experience=4
Name=sindhu
Qualification=mca
Date of birth=9-11-2000
Gender=female
Experience=3
Name=disha
Qualification=bca
Date of birth=4-09-2000
Gender=female
Experience=2
```

6. Create a class ComplexArithmetic to perform Complex number arithmetic operations. A Complex object should be created in the main method enclosed within a class ComplexMain. The complex arithmetic operations should be executed in a menu-driven way.

CODE:

```
import java.util.*;

class Ans6

{

int num1, num2;

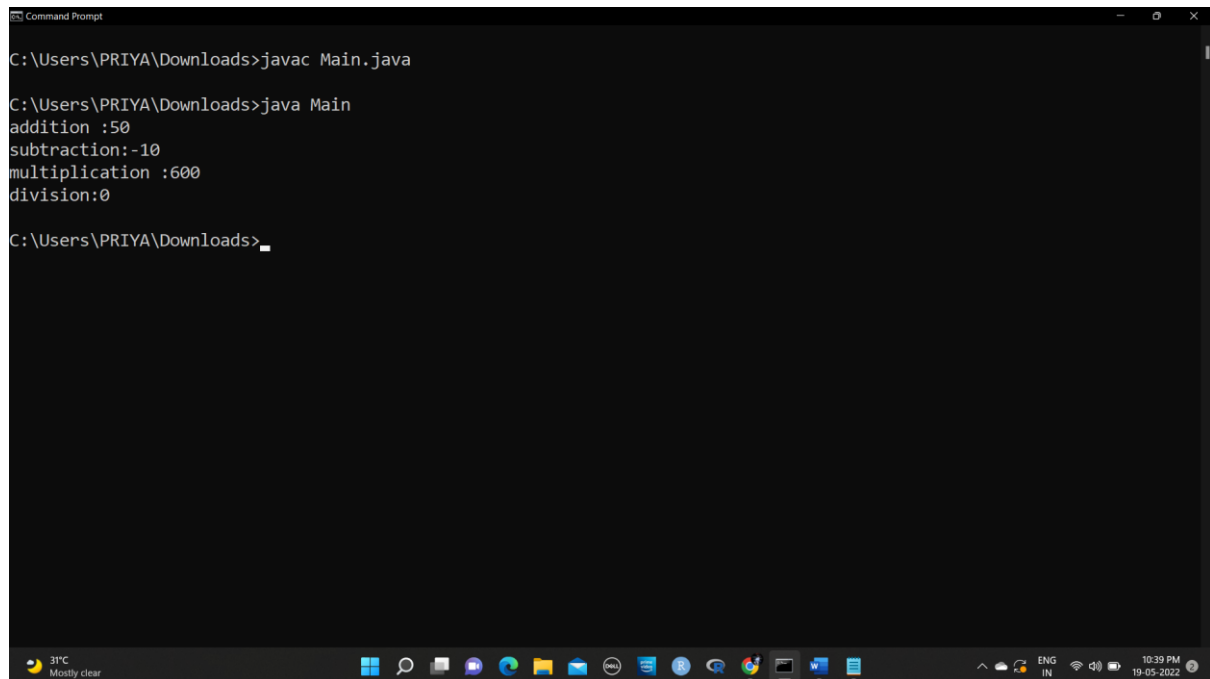
Ans6 (int a, int b) {

num1 = a;

num2 = b,
```

```
}  
  
int add()  
{  
    return num1 + num2;  
}  
  
int sub()  
{  
    return num1 - num2;  
}  
  
int mul()  
{  
    return num1 * num2;  
}  
  
int div()  
{  
    return num1/num2;  
}  
}  
  
class Main {  
    public static void main(String args[])  
    {  
        Ans6 sc = new Ans6(20, 30);  
        int operation;  
        operation = sc.add();  
        System.out.println("addition :" + operation);  
        operation = sc.sub();  
        System.out.println("subtraction:" + operation);  
        operation = sc.mul();  
        System.out.println("multiplication :" + operation);  
        operation = sc.div();  
        System.out.println("division:" + operation);  
    }  
}
```

OUTPUT:



```
Command Prompt
C:\Users\PRIYA\Downloads>javac Main.java
C:\Users\PRIYA\Downloads>java Main
addition :50
subtraction:-10
multiplication :600
division:0
C:\Users\PRIYA\Downloads>
```

7. Develop a class TelephoneIndex with two String objects as members. One should hold subscribers' names, and the other should hold their phone numbers. The class should have appropriate constructor, input and display methods. Create an array of objects for TelephoneIndex and do the following: a) Your program should ask the user to enter a name or the first few characters of a name to search for it in the array and display the corresponding phone number. b) The program should display all the names that match the user's input and corresponding phone numbers.

CODE:

```
import java.util.Scanner;

class TelephoneIndex
{
    String name,phoneno;

    TelephoneIndex()
    {

    }

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

        System.out.println("Enter your name:");

        name=sc.nextLine();

        System.out.println("Enter the phone number:");

        phoneno=sc.nextLine();
    }
}
```

```

    }
    void display()
    {
        System.out.println("Name="+name);
        System.out.println("Phone Number="+phoneno);
    }
}

public class Ans7
{
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the no of customers:");
        int n=sc.nextInt();
        sc.nextLine();
        TelephoneIndex t[]=new TelephoneIndex[n];
        for(int i=0;i<n;i++)
        {
            t[i]=new TelephoneIndex();
            t[i].input();
        }
        System.out.println("Enter a name to search:");
        String search=sc.nextLine();
        for(int i=0;i<n;i++)
        {
            if(t[i].name.contains(search))
            {
                t[i].display();
            }
        }
    }
}

```

OUTPUT:


```
Command Prompt
C:\Users\PRIYA\Downloads>javac Ans7.java

C:\Users\PRIYA\Downloads>java Ans7
Enter the no of customers:
3
Enter your name:
priya
Enter the phone number:
6385338901
Enter your name:
ashika
Enter the phone number:
9003957779
Enter your name:
sindhu
Enter the phone number:
900395667
Enter a name to search:
priya
Name=priya
Phone Number=6385338901

C:\Users\PRIYA\Downloads>
```

8. Implement profit/loss calculation for each of the products provided and also the total profit/loss using inheritance in java. The following classes and class members have to be part of the solution 1) ProfitLossCalculation -- child class of productData which implements the function calculate() to calculate the profit or loss 2) super class -- ProductData -- which stores the product information and implements printProduct() to print product information.

CODE:

```
import java.util.Scanner;

class Ans8
{

    public static void main(String args[])
    {

        Scanner s= new Scanner(System.in);

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

        double cp=s.nextDouble();

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

        double sp=s.nextDouble();

        if(cp-sp>0)
        {

            System.out.println("loss:" +(cp-sp));

        }

    }

}
```

```

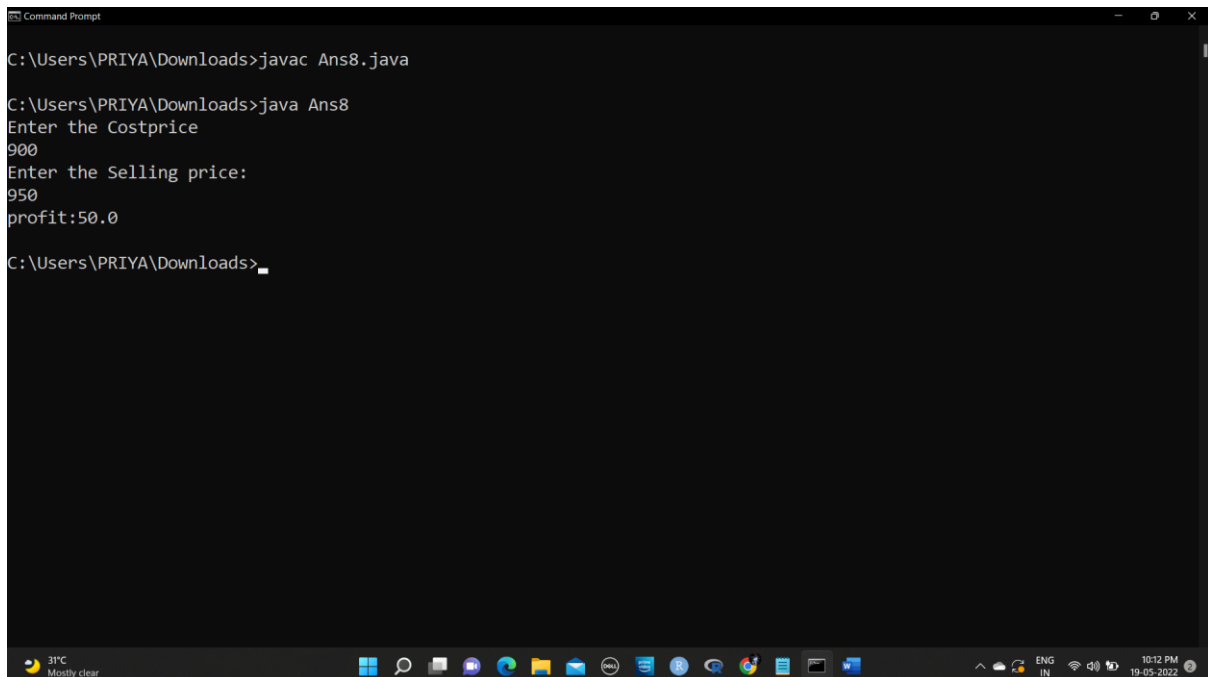
        else if(cp-sp<0)
        {
            System.out.println("profit:" +(sp-cp));
        }
        else

            System.out.println("NEUTRAL");

    }
}

```

OUTPUT:



```

C:\Users\PRIYA\Downloads>javac Ans8.java

C:\Users\PRIYA\Downloads>java Ans8
Enter the Costprice
900
Enter the Selling price:
950
profit:50.0

C:\Users\PRIYA\Downloads>

```

9. Create a class CARD with cardno, cust_name, bank_name as data members. Provide suitable constructors to create a CARD object. Create another class Creditcard that inherits the properties of CARD. In addition to the CARD properties, Creditcard will have an additional 'limit' data member. Provide suitable constructors. Include methods 'display' and 'use'. Display method should display the details of a credit card. The use method in Creditcard should decrease the limit by the amount used. Make sure that the user never exceeds the available limit. Create a demo class to test for 'n' Creditcard objects.

CODE:

```

import java.util.*;

class CARD

{

    int cardno;

```

```

String cust_name,bank_name;
CARD()
{
Scanner sc=new Scanner(System.in);
System.out.print("Enter cardno:");
cardno=sc.nextInt();
sc.nextLine();
System.out.print("Enter customer name:");
cust_name=sc.nextLine();
System.out.print("Enter bank name:");
bank_name=sc.nextLine();
}
}
class Creditcard extends CARD
{
int limit,amount;
Creditcard()
{
Scanner sc=new Scanner(System.in);
System.out.print("Enter limit:");
limit=sc.nextInt();
}
void use()
{
Scanner sc=new Scanner(System.in);
System.out.print("Enter amount:");
amount=sc.nextInt();
if(limit>amount)
{
limit=limit-amount;
display();
}
}

```

else

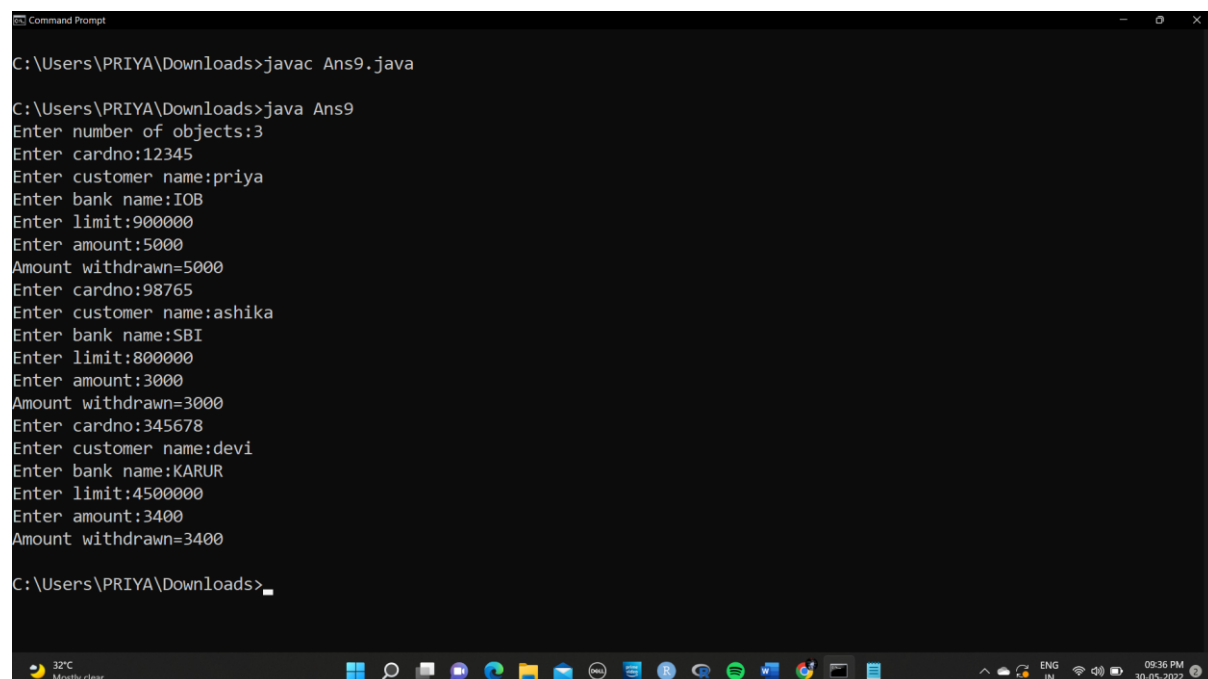
```

System.out.println("Amount exceeded the limit");
}
void display()
{
System.out.println("Amount withdrawn="+amount);
}
}

public class Ans9
{
public static void main(String[] args) {
Scanner sc=new Scanner(System.in);
System.out.print("Enter number of objects:");
int n=sc.nextInt();
Creditcard c[]=new Creditcard[n];
for(int i=0;i<n;i++)
{
c[i]=new Creditcard();
c[i].use();
}
}}

```

OUTPUT:



```

C:\Users\PRIYA\Downloads>javac Ans9.java

C:\Users\PRIYA\Downloads>java Ans9
Enter number of objects:3
Enter cardno:12345
Enter customer name:priya
Enter bank name:IOB
Enter limit:900000
Enter amount:5000
Amount withdrawn=5000
Enter cardno:98765
Enter customer name:ashika
Enter bank name:SBI
Enter limit:800000
Enter amount:3000
Amount withdrawn=3000
Enter cardno:345678
Enter customer name:devi
Enter bank name:KARUR
Enter limit:450000
Enter amount:3400
Amount withdrawn=3400
C:\Users\PRIYA\Downloads>_

```

10. Write an inheritance hierarchy for classes Quadrilateral, Trapezoid, Parallelogram, Rectangle and Square. Use Quadrilateral as the superclass of the hierarchy. Create and use a Point class to represent the points in each shape. Make the hierarchy as deep (i.e., as many levels) as possible. Specify the instance variables and methods for each class. The private instance variables of Quadrilateral should be the x-y coordinate pairs for the four endpoints of the Quadrilateral. Write a program that instantiates objects of your classes and outputs each object's area (except Quadrilateral).

CODE:

```
class Quadrilateral
{
protected int x1,x2,x3,x4,y1,y2,y3,y4;
protected void setCoordinate(int a,int b,int c,int d,int e,int f,int g,int
h)
{
x1=a;
y1=b;
x2=c;
y2=d;
x3=e;
y3=f;
x4=g;
y4=h;
}
}
class Square extends Quadrilateral
{
Square(int a,int b,int c,int d,int e,int f,int g,int h)
{
setCoordinate(a,b,c,d,e,f,g,h);
}
int area()
{
int d=(int)Math.sqrt((x1-x2)*(x1-x2)+(y1-y2)*(y1-y2));
return d*d;
```

```
}
```

```
}
```

```
class Rectangle extends Quadrilateral
```

```
{
```

```
Rectangle(int a,int b,int c,int d,int e,int f,int g,int h)
```

```
{
```

```
setCoordinate(a,b,c,d,e,f,g,h);
```

```
}
```

```
int area()
```

```
{
```

```
int d1=(int)Math.sqrt((x1-x2)*(x1-x2)+(y1-y2)*(y1-y2));
```

```
int d2=(int)Math.sqrt((x1-x4)*(x1-x4)+(y1-y4)*(y1-y4));
```

```
return d1*d2;
```

```
}
```

```
}
```

```
class Trapezoid extends Quadrilateral
```

```
{
```

```
private int height;
```

```
Trapezoid(int a,int b,int c,int d,int e,int f,int g,int h,int height)
```

```
{
```

```
setCoordinate(a,b,c,d,e,f,g,h);
```

```
this.height=height;
```

```
}
```

```
int area()
```

```
{
```

```
int d1=(int)Math.sqrt((x1-x2)*(x1-x2)+(y1-y2)*(y1-y2));
```

```
int d2=(int)Math.sqrt((x3-x4)*(x3-x4)+(y3-y4)*(y3-y4));
```

```
return (int)((d1+d2)*height)/2;
```

```
}
```

```
}
```

```
class Parallelogram extends Quadrilateral
```

```
{
```

```
private int height;
```

```

Parallelogram(int a,int b,int c,int d,int e,int f,int g,int h,int height)
{
setCoordinate(a,b,c,d,e,f,g,h);
this.height=height;
}
int area()
{
int d1=(int)Math.sqrt((x1-x2)*(x1-x2)+(y1-y2)*(y1-y2));
return d1*height;
}
}
public class Ans10
{
public static void main(String []args)
{
Square sq=new Square(10,10,20,10,20,20,10,20);
System.out.println("Area Of The Square is " + sq.area());
Rectangle rec=new Rectangle(10,10,30,10,30,20,10,20);
System.out.println("Area Of The Rectangle is " + rec.area());
Parallelogram p=new Parallelogram(10,10,30,10,20,20,0,20,8);
System.out.println("Area Of The Parallelogram is " + p.area());
Trapezoid t=new Trapezoid(10,10,30,10,40,20,0,20,8);
System.out.println("Area Of The Trapezoid is " + t.area());
}
}

```

OUTPUT:

```
Command Prompt
C:\Users\PRIYA\Downloads>javac Ans10.java

C:\Users\PRIYA\Downloads>java Ans10
Area Of The Square is 100
Area Of The Rectangle is 200
Area Of The Parallelogram is 160
Area Of The Trapezoid is 240

C:\Users\PRIYA\Downloads>
```

11. The interface GCD contains an abstract method computeGCD(int num1, int num2). Class APPROACH1 implements the interface by following Euclid's algorithm and class APPROACH2 implements the interface by listing all the factors (need not be prime factors) of the two numbers and choosing the highest common factor. Write a Java program to do the above-said operations.

CODE:

```
import java.util.Scanner;

interface GCD{

int computeGCD(int num1,int num2);

}

class APPROACH1 implements GCD
{
public int computeGCD(int num1, int num2){
if (num2 == 0){
return num1;
}
return computeGCD(num2, num1 % num2);
}
}

class APPROACH2 implements GCD
{
public int computeGCD(int num1, int num2) {
```



```

int i;
int gcd = 1;
for(i=num2;i>1;i--)
{
if(num1%i==0 && num2%i==0)
{
gcd=i;
break;
}
}
return(gcd);
}
}

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

int num1 = in.nextInt();
int num2 = in.nextInt();

System.out.println("GCD by Euclid's method: " + new APPROACH1().computeGCD(num1,num2));
System.out.println("GCD by listing all factors: " + new APPROACH2().computeGCD(num1,num2));
}
}

```

OUTPUT:

```
Command Prompt
Microsoft Windows [Version 10.0.22000.675]
(c) Microsoft Corporation. All rights reserved.

C:\Users\PRIYA>cd downloads

C:\Users\PRIYA\Downloads>javac Problem.java

C:\Users\PRIYA\Downloads>java Problem
90
78
GCD by Euclid's method: 6
GCD by listing all factors: 6

C:\Users\PRIYA\Downloads>
```

12. Write an abstract class Special with an abstract method double process (double P,double R). Create a subclass Discount and implement the process() method. Return the process() method with the following formula: $total = P + P * R / 100$. Return the total.

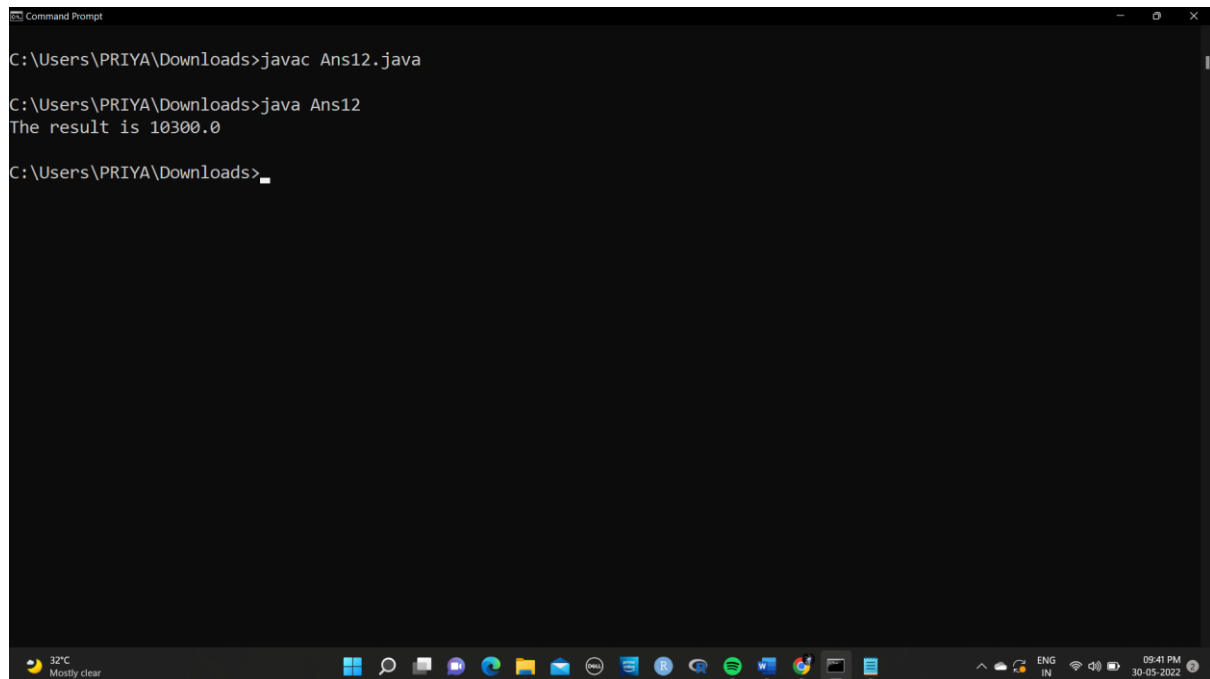
CODE:

```
abstract class Special{
    abstract double process(double P,double R);
}

class Discount extends Special{
    double process(double P,double R)
    {
        return P+P*R/100;
    }
}

public class Ans12
{
    public static void main(String args[])
    {
        Discount d=new Discount();
        double result = d.process(10000,3);
        System.out.println("The result is "+result);
    }
}
```

OUTPUT:



```
Command Prompt
C:\Users\PRIYA\Downloads>javac Ans12.java
C:\Users\PRIYA\Downloads>java Ans12
The result is 10300.0
C:\Users\PRIYA\Downloads>
```

13. Create a package called pack1. Add two classes Sum and Difference (calculate the sum and difference of two numbers) to it. Create a subpackage called subpack1. Add two classes Product and Quotient (calculate the product and quotient of two numbers) to it. Write a program to read values from the user and perform the arithmetic operations by using the package classes

CODE:

```
public class Sum
{
    public Sum(int a,int b)
    {
        System.out.println("Sum of the two number is: "+(a+b));
    }
}
```

```
package pack1;
```

```
public class Difference {  
    public Difference(int a,int b)  
    {  
        if (a>b)  
        {  
            System.out.println("Difference of two number is: "+(a-  
b));  
        }  
        else  
        {  
            System.out.println("Difference of two number is: "+(b-  
a));  
        }  
    }  
}
```

```
package pack1.subpack1;
```

```
public class Product
```

```
{  
    public Product(int a,int b)  
    {  
        System.out.println("Product of two numbers: "+(a*b));  
    }  
}
```

```
package pack1.subpack1;
```

```
public class Quotient
```

```
{  
    public Quotient(int a,int b)  
    {  
        System.out.println("Quotient of two number is: "+(a/b));  
    }  
}
```

```
package TrainingPgm;
```

```
import pack1.Sum;
```

```
import pack1.Difference;
```

```
import pack1.subpack1.Product;
```

```
import pack1.subpack1.Quotient;
```

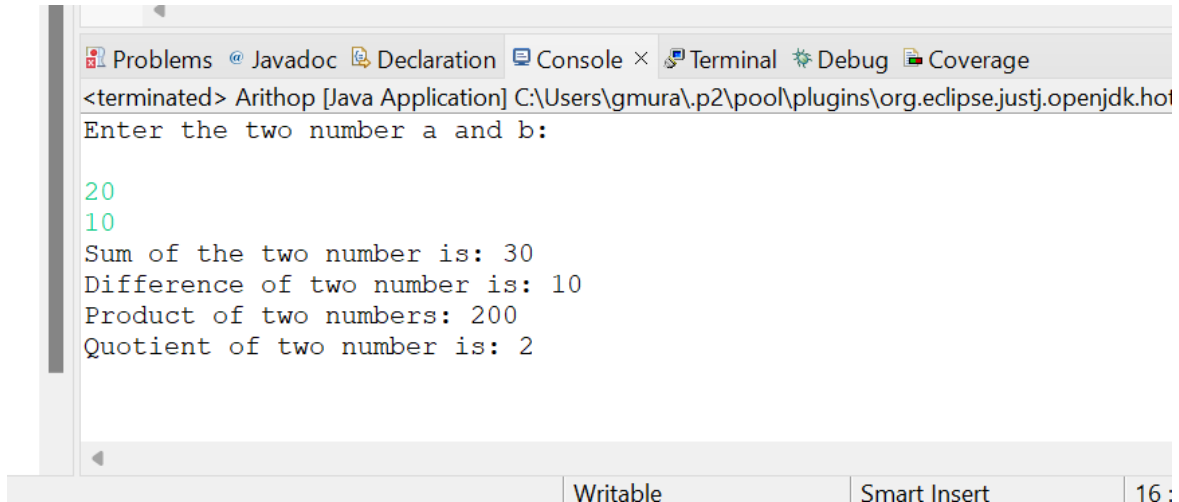
```
import java.util.Scanner;
```

```
public class Arithop
```

```
{  
    public static void main(String args[])  
    {  
        Scanner sc = new Scanner(System.in); System.out.println("Enter the  
        two number a and b: \n");int a = sc.nextInt();  
  
        int b = sc.nextInt(); Sum s1  
        = new Sum(a,b);  
  
        Difference d1 = new Difference(a,b);Product  
        p1 = new Product(a,b); Quotient q1 = new  
        Quotient(a,b);
```

```
}  
}
```

OUTPUT:



```
Problems @ Javadoc Declaration Console × Terminal Debug Coverage  
<terminated> Arithop [Java Application] C:\Users\gmura\.p2\pool\plugins\org.eclipse.justj.openjdk.hot  
Enter the two number a and b:  
  
20  
10  
Sum of the two number is: 30  
Difference of two number is: 10  
Product of two numbers: 200  
Quotient of two number is: 2  
  
Writable Smart Insert 16:
```

14. Create an interface with methods add () and sub () in a package called ‘pack1’. Create another package ‘pack2’ with an interface with methods multiply () and divide (). Write a main class to perform arithmetic operations on integer numbers by implementing both interfaces

CODE:

```
package expack1;  
  
public interface addsub  
{  
    public int add(int a,int b);  
    public int sub(int a,int b);  
}  
  
package expack2;  
  
public interface muldiv  
{  
    public int multiply(int a,int b);  
    public int divide(int a,int b);  
}
```

```
package TrainingPgm;
import expack1.*;
import expack2.*;

import java.util.Scanner;

public class Asmd implements addsub,muldiv
{
    public int add(int a,int b)
    {
        return a+b;
    }
    public int sub(int a,int b)
    {
        return a-b;
    }
}
```

```

public int multiply(int a,int b)
{
return a*b;
}
public int divide(int a,int b)
{
    return a/b;
}
public static void main(String args[])
{
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the two number a and b: \n");int
    a = sc.nextInt();

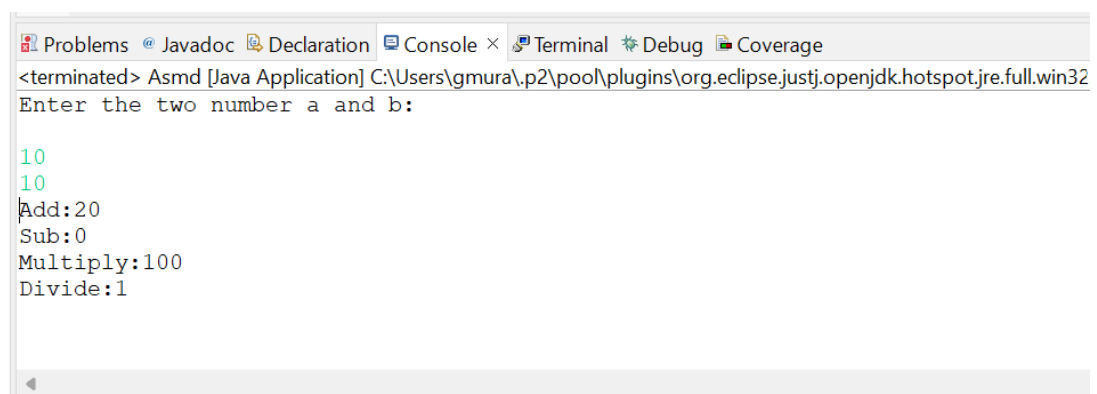
    int b =
    sc.nextInt();
    Asmd obj = new
    Asmd();

    System.out.println("Add:"+obj.add(a,b));
    System.out.println("Sub:"+obj.sub(a,b));
    System.out.println("Multiply:"+obj.multiply(a,b));
    System.out.println("Divide:"+obj.divide(a,b));

}
}

```

OUTPUT:



```

Problems Javadoc Declaration Console × Terminal Debug Coverage
<terminated> Asmd [Java Application] C:\Users\gmura\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32
Enter the two number a and b:
10
10
Add:20
Sub:0
Multiply:100
Divide:1

```