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1.

Create a base class Shape with relevant data members and member functions to

get data and print the area. Create two more classes Rectangle and Triangle

which inherit Shape class. Test the classes in main method.

Program:

interface Shape

{

public double pi = 3.14;

public double perimeter();

public double area();

}

class Circle implements Shape

{

double r;

Circle(double rad) { r = rad; }

public double perimeter() { return (2\*pi\*r); }

public double area() {

return (pi\* r\*r);

}

}

class ellipse implements Shape

{

double a,b;

ellipse(double a,double b) { this.a=a; this.b=b; }

public double perimeter() { return (2\*pi\*Math.sqrt((a\*a)\*(b\*b)))\*0.5;}

public double area() {

return pi\*a\*b;

}

}

public class Test

{

public static void main(String args[])

{

Circle c = new Circle(3.2);

ellipse e = new ellipse(3,6);

Shape s= c;

System.out.println("perimeter of circle =" +s.perimeter());

System.out.println("Area of circle =" +s.area());

s= e;

System.out.println("perimetwr of ellipse =" +s.perimeter());

System.out.println("Area of ellipse =" +s.area());

}

}

OUTPUT:

perimeter of circle =20.096000000000004

Area of circle =32.153600000000004

perimetwr of ellipse =56.52

Area of ellipse =56.519999999999996

2.

Design a vehicle class that contains the following properties of motor vehicles:

Fuel tank capacity, average fuel consumption per 100 km and the distance a

vehicle can travel on a full tank. The vehicle class should be designed as a base

class from which the Car and Truck classes are derived. The derived classes

should have following member functions.

 A function that contains data for a vehicle from the user

 A function that computes and returns the distance a vehicle can travel on a

full tank.

 A function that computes and returns how many times a vehicle has to be

refueled to travel a given distance.

Test the class in the main method.

Program:

class vehicle {

int capacity;

float consumption;

float distance ;

vehicle(int c, float consume , float d)

{

capacity = c;

consumption = consume;

distance = d;

}

}

class car extends vehicle {

car(int c, float consume , float d)

{

super(c,consume,d);

}

float computeDistance()

{

float d = (capacity \* 100.0f) / consumption;

return d;

}

float computeFuel(int d)

{

return d/ this.distance;

}

}

class Truck extends vehicle

{

Truck(int c, float consume , float d)

{

super(c,consume,d);

}

float computeDistance()

{

float d = (capacity \* 100.0f) / consumption;

return d;

}

float computeFuel(int d)

{

return d/ this.distance;

}

}

public class Main

{

public static void main(String args[])

{

car c = new car(20,15,400);

Truck T = new Truck (40,25,450);

System.out.println("distance covered on ful tank " + c.computeDistance());

System.out.println("no of filling is required"+ c.computeFuel(400));

System.out.println("distance covered on ful tank " + T.computeDistance());

System.out.println("no of filling is required"+ T.computeFuel(450));

}

}

Output:

distance covered on ful tank 133.33333

no of filling is required1.0

distance covered on ful tank 160.0

no of filling is required1.

03.Create three classes Student, Test and Result classes. The student class

contains student relevant information. Test class contains marks for five subjects.

The result class contains Total and average of the marks obtained in five

subjects. Inherit the properties of Student and Test class details in Result class

through multilevel inheritances.

Code:

class Student

{

int regno;

String name, dept;

Student(int rno, String name, String dept)

{

regno = rno; this.name=name; this.dept =dept;

}

void display()

{

System.out.print(regno + " "+ name + " "+ dept);

}

}

class Test extends Student

{

int marks[];

Test(int r, String n, String d, int m[])

{

super(r,n,d);

marks = m;

}

}

class Result extends Test

{

Result(int r, String n, String d, int m[])

{

super(r,n,d,m);

}

void printResult() {

display();

int sum = 0;

for (int i =0; i< marks.length; i++)

sum += marks[i];

System.out.println(" Total Marks: "+ sum + " Average = " + (sum/5.0) );

}

}

public class TestMain

{

public static void main(String arg[])

{

int mark[]= {80,85,92,79,80};

Result r = new Result(4137, "Ravi", "CSE", mark);

r.printResult();

int mark2[] = {90,82,93,78,80};

Result r2 = new Result(4138,"raghu", "CSE", mark2);

r2.printResult();

}

}

Output:

4137 Ravi CSE Total Marks: 416 Average = 83.2

4138 raghu CSE Total Marks: 423 Average = 84.6