1) Creat a base class Employee with member variable salary.and inherit all the properties of base class in child class programmer which has variables bonus and totalSalary and calculate totalSalary. And access it in main class.

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**package** inheritance1;

**public** **class** Employee {

**int** salary;

**public** Employee(**int** salary) {

**super**();

**this**.salary = salary;

}

@Override

**public** String toString() {

**return** "Employee [salary=" + salary + "]";

}

}

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**package** inheritance1;

**public** **class** Programmer **extends** Employee {

**int** bonus;

**double** totalSalary;

**public** Programmer(**int** salary,**int** bonus) {

**super**(salary);

**this**.bonus=bonus;

totalSalary=(salary+bonus);

}

@Override

**public** String toString() {

**return** **super**.toString()+"Programmer [bonus=" + bonus + ", totalSalary=" + totalSalary + "]";

}

}

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**package** inheritance1;

**public** **class** Testing {

**public** **static** **void** main(String[] args) {

Programmer p=**new** Programmer(10000,3500);

System.***out***.println(p);

}

}

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**output:**

Employee [salary=10000]Programmer [bonus=3500, totalSalary=13500.0]

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2)Creat a base class Bicycle with member variables gear,speed and use a method applyBrake(int value) and speedUp(int value) as giving values to variable value speed should reduse in applyBrake method and speed should increase in speedUp method. And create a derived class MountainBike and use a seatHight() method to adjust seat hight and inherit all the properties off base class.and access it in main class.

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**package** inheritance2;

**public** **class** Bicycle {

**int** gear,speed;

**public** Bicycle(**int** gear, **int** speed) {

**super**();

**this**.gear = gear;

**this**.speed = speed;

}

**public** **int** applyBrake(**int** value) {

**return** speed=speed-value;

}

**public** **int** speedUp(**int** value) {

**return** speed=speed+value;

}

@Override

**public** String toString() {

**return** "Bicycle [gear=" + gear + ", speed=" + speed + "]";

}

}

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**package** inheritance2;

**public** **class** MountainBike **extends** Bicycle{

**public** MountainBike(**int** gear, **int** speed) {

**super**(gear, speed);

// **TODO** Auto-generated constructor stub

}

**public** **int** seatHight(**int** hight) {

**return** hight;

}

@Override

**public** String toString() {

**return** **super**.toString()+"MountainBike []";

}

}

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**package** inheritance2;

**public** **class** Test {

**public** **static** **void** main(String[] args) {

// Bicycle b=new Bicycle(4,80);

// System.out.println(b);

// System.out.println("bike spead when break is applied: "+b.applyBrake(20));

// System.out.println("bike spead when spead is increased: "+b.speedUp(40));

MountainBike m=**new** MountainBike(4,80);

System.***out***.println(m);

System.***out***.println("Current Seat hight: "+m.seatHight(10));

System.***out***.println("bike spead when break is applied: "+m.applyBrake(20));

System.***out***.println("bike spead when spead is increased: "+m.speedUp(40));

}

}

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**output:**

Bicycle [gear=4, speed=80]MountainBike []

Current Seat hight: 10

bike spead when break is applied: 60

bike spead when spead is increased: 100

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3)HIERARCHICAL INHERITANCE

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**package** inheriting;

//Bse class

**public** **class** Shape {

**int** id;

String name,colour;

**public** Shape(**int** id, String name, String colour) {

**super**();

**this**.id = id;

**this**.name = name;

**this**.colour = colour;

}

@Override

**public** String toString() {

**return** "Shape [id=" + id + ", name=" + name + ", colour=" + colour + "]";

}

}

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**package** inheriting;

//child class of shape and base class of Square and triangle

**public** **class** TwoD **extends** Shape {

**int** length,width;

**public** TwoD(**int** id, String name, String colour) {

**super**(id, name, colour);

// **TODO** Auto-generated constructor stub

}

**public** TwoD(**int** id, String name, String colour, **int** length, **int** width) {

**super**(id, name, colour);

**this**.length = length;

**this**.width = width;

}

@Override

**public** String toString() {

**return** **super**.toString()+"TwoD [length=" + length + ", width=" + width + "]";

}

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**package** inheriting;

//child class

**public** **class** Square **extends** TwoD {

**int** area;

**public** Square(**int** id, String name, String colour, **int** length, **int** width) {

**super**(id, name, colour, length, width);

area=(length\*width);

}

@Override

**public** String toString() {

**return** **super**.toString()+"Square [area=" + area + "]";

}

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**package** inheriting;

//child class

**public** **class** triangle **extends** TwoD {

**double** area;

**public** triangle(**int** id, String name, String colour, **int** length, **int** width) {

**super**(id, name, colour, length, width);

area=(0.5\*length\*width);

// **TODO** Auto-generated constructor stub

}

@Override

**public** String toString() {

**return** **super**.toString()+"triangle [area=" + area + "]";

}

}

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**package** inheriting;

//child class of shape and base class of pentagon and Hexagon

**public** **class** ThreeD **extends** Shape {

**int** length,width,hight;

**public** ThreeD(**int** id, String name, String colour) {

**super**(id, name, colour);

// **TODO** Auto-generated constructor stub

}

**public** ThreeD(**int** id, String name, String colour, **int** length, **int** width, **int** hight) {

**super**(id, name, colour);

**this**.length = length;

**this**.width = width;

**this**.hight = hight;

}

@Override

**public** String toString() {

**return** **super**.toString()+"ThreeD [length=" + length + ", width=" + width + ", hight=" + hight + "]";

}

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**package** inheriting;

//child class

**public** **class** pentagon **extends** ThreeD{

**public** pentagon(**int** id, String name, String colour, **int** length, **int** width, **int** hight) {

**super**(id, name, colour, length, width, hight);

}

}

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**package** inheriting;

//child class

**public** **class** Hexagon **extends** ThreeD {

**public** Hexagon(**int** id, String name, String colour, **int** length, **int** width, **int** hight) {

**super**(id, name, colour, length, width, hight);

}

}

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**package** inheriting;

//Main class

**public** **class** Test {

**public** **static** **void** main(String[] args) {

Square s=**new** Square(101,"sam","black",23,10);

System.***out***.println(s);

triangle a=**new** triangle(102,"jhon","white",15,18);

System.***out***.println(a);

pentagon b=**new** pentagon(103,"harry","yellow",7,26,30);

System.***out***.println(b);

Hexagon c=**new** Hexagon(104,"dany","red",7,10,45);

System.***out***.println(c);

}

}

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**output:**

Shape [id=101, name=sam, colour=black]TwoD [length=23, width=10]Square [area=230]

Shape [id=102, name=jhon, colour=white]TwoD [length=15, width=18]triangle [area=135.0]

Shape [id=103, name=harry, colour=yellow]ThreeD [length=7, width=26, hight=30]

Shape [id=104, name=dany, colour=red]ThreeD [length=7, width=10, hight=45]

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