**ASSIGNMENT 11: INHERITANCE**

**1.Create base class Employee with member variables salary and inherit all the property of base class in child class programmer which has variables bonus and total salary and calculate totalsalary. Create a main class.**

**Base Class**

**package** inheritance;

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

**int** salary;

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

{

**super**();

**this**.salary=salary;

}

@Override

**public** String toString() {

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

}

}

**Child class**

**package** inheritance;

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

**int** bonus;

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

{

**super**(salary);

**this**.bonus=bonus;

}

**public** **int** totalSalary()

{

**return** salary+bonus;

}

@Override

**public** String toString() {

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

}

}

**Main class**

**package** inheritance;

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

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

Programmer p=**new** Programmer(20000,5000);

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

System.***out***.println("total salary = "+p.totalSalary());

}

}

**Output:**

Employee [salary=20000]Programmer [bonus=5000]

total salary = 25000

**2 .Create a base class Bicycle and child class MountainBike. Find the speed of bike after increasing the speed and also speed of the bike after applying break.**

**Base Class**

**package** Inheritance2;

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

**int** gear;

**int** speed;

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

**super**();

**this**.gear = gear;

**this**.speed = speed;

}

**public** **int** applyBreak(**int** value)

{

**return** speed-=value;

}

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

{

**return** speed+=value;

}

@Override

**public** String toString() {

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

}

}

**Child Class**

**package** Inheritance2;

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

**int** seatheight;

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

**super**(gear, speed);

**this**.seatheight=seatheight;

}

@Override

**public** String toString() {

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

}

}

**Main Class**

**package** Inheritance2;

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

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

MountainBike m=**new** MountainBike(4,70,10);

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

System.***out***.println("bike speed after applying break= "+m.applyBreak(20));

System.***out***.println("bike speed when speed increased="+m.speedUp(40));

}

}

**Output:**

Bicycle [gear=4, speed=70]MountainBike [seatheight=10]

bike speed after applying break= 50

bike speed when speed increased=90

**3 .Hierarchical Inheritance Program.**

**package** inheritance3;

**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 + "]";

}

}

**TwoD**

**package** inheritance3;

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

**int** length;

**int** width;

**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 + "]";

}

}

**Square**

**package** inheritance3;

**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 + "]";

}

}

**Triangle**

**package** inheritance3;

**public** **class** Triangle **extends** TwoD{

**double** area1;

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

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

area1=(0.5\*length\*width);

}

@Override

**public** String toString() {

**return** **super**.toString()+"Triangle [area1=" + area1 + "]";

}

}

**ThreeD**

**package** inheritance3;

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

**int** length,width,height;

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

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

**this**.length = length;

**this**.width = width;

**this**.height = height;

}

@Override

**public** String toString() {

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

}

}

**Pentagon**

**package** inheritance3;

**public** **class** Pentagon **extends** ThreeD{

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

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

}

}

**Hexagone**

**package** inheritance3;

**public** **class** Hexagone **extends** ThreeD {

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

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

}

}

**Test**

**package** inheritance3;

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

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

Square s=**new** Square(101,"square","black",10,20);

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

Triangle t=**new** Triangle(102,"triangle","white",20,30);

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

Pentagon p=**new** Pentagon(103,"pentagon","orange",5,10,15);

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

Hexagone h=**new** Hexagone(104,"hexagone","green",10,20,30);

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

}

}

**Output**

Shape [id=101, name=square, colour=black]TwoD [length=10, width=20]Square [area=200]

Shape [id=102, name=triangle, colour=white]TwoD [length=20, width=30]Triangle [area1=300.0]

Shape [id=103, name=pentagon, colour=orange]ThreeD [length=5, width=10, height=15]

Shape [id=104, name=hexagone, colour=green]ThreeD [length=10, width=20, height=30]