

LAB10_ANP_C6339_INHERITANCE

Due date: Wednesday, 22 November 2023, 5:30 AM

Maximum number of files: 1

Type of work: Individual work

Lingabathula Thapaswi[AF0339471]

Submit any one among the 2 assignments

Assignment-1.

- Write a Java program to create a class called Vehicle with a method called drive().
- Vehicle should have attributes such as make (String), model (String) , year (int) and maximumSpeed (int).
- Create a constructor in Vehicle with all fields as constructor parameters.
- Create a subclass called Car and override constructor. Call super().
- Write a function that overrides the drive() method to print (make + " " + model + " Car is driving".)
- Also create another subclass Bike extending the vehicle class.
- Override the drive() method to print (make + " " + model + " Bike is driving".)
- Instantiate both Bike and Car class. Print their attributes.

Solution:-

```
class Vehicle {  
    String make;  
    String model;  
    int year;  
    int maximumSpeed;  
  
    public Vehicle(String make, String model, int year, int maximumSpeed) {  
        this.make = make;  
        this.model = model;  
        this.year = year;  
        this.maximumSpeed = maximumSpeed;  
    }  
  
    public void drive() {
```

```
        System.out.println("Repairing a vehicle");
    }

    public void printAttributes() {
        System.out.println("Make: " + make);
        System.out.println("Model: " + model);
        System.out.println("Year: " + year);
        System.out.println("Maximum Speed: " + maximumSpeed);
    }
}

class Car extends Vehicle {
    public Car(String make, String model, int year, int maximumSpeed) {
        super(make, model, year, maximumSpeed);
    }

    @Override
    public void drive() {
        System.out.println(make + " " + model + " Car is driving");
    }
}

class Bike extends Vehicle {
    public Bike(String make, String model, int year, int maximumSpeed) {
        super(make, model, year, maximumSpeed);
    }

    @Override
    public void drive() {
        System.out.println(make + " " + model + " Bike is driving");
    }
}

public class VehicleMain {
    public static void main(String[] args) {
        Car car = new Car("Honda", "Civic", 2023, 120);
    }
}
```

```

        Bike bike = new Bike("Yamaha", "R1", 2022, 180);

        car.drive();

        car.printAttributes();

        bike.drive();

        bike.printAttributes();

    }

}

```

Output:

```

C:\Users\thila\OneDrive\Desktop\Anudip_Labs>javac VehicleMain.java

C:\Users\thila\OneDrive\Desktop\Anudip_Labs>java VehicleMain
Honda Civic Car is driving
Make: Honda
Model: Civic
Year: 2023
Maximum Speed: 120
Yamaha R1 Bike is driving
Make: Yamaha
Model: R1
Year: 2022
Maximum Speed: 180

```

Assignment-2.

- Write a Java program to create a class called Shape with a method called getArea().
- Create a subclass called Circle and create a constructor that takes the value of radius(int) as input parameter.
- Override the getArea() method.
- Create a subclass called square and Create a constructor that takes an attribute length as input parameter.
- Override the getArea() method.
- Create a subclass of Shape called Rectangle that takes width and height as input to the constructor.
- Override the getArea() method to calculate the area of a rectangle. Instantiate and call getArea() method.

Solution:-

```

// Shape class
abstract class Shape {
    abstract void getArea();
}

```

```
// Circle class

class Circle extends Shape {

    private int radius;


    public Circle(int radius) {

        this.radius = radius;

    }


    @Override

    public void getArea() {

        double area = Math.PI * radius * radius;

        System.out.println("Circle area: " + area);

    }

}
```

```
// Square class

class Square extends Shape {

    private int length;


    public Square(int length) {

        this.length = length;

    }


    @Override

    public void getArea() {

        int area = length * length;

        System.out.println("Square area: " + area);

    }

}
```

```
// Rectangle class

class Rectangle extends Shape {

    private int width;

    private int height;
```

```
public Rectangle(int width, int height) {  
    this.width = width;  
    this.height = height;  
}  
  
@Override  
public void getArea() {  
    int area = width * height;  
    System.out.println("Rectangle area: " + area);  
}  
}
```

// Main class

```
public class ShapeMain {  
    public static void main(String[] args) {  
        // Create a Circle object  
        Circle circle = new Circle(5);  
        circle.getArea();  
  
        // Create a Square object  
        Square square = new Square(10);  
        square.getArea();  
  
        // Create a Rectangle object  
        Rectangle rectangle = new Rectangle(20, 30);  
        rectangle.getArea();  
    }  
}
```

Output:

```
C:\Users\thila\OneDrive\Desktop\Anudip_Labs>javac ShapeMain.java  
C:\Users\thila\OneDrive\Desktop\Anudip_Labs>java ShapeMain  
Circle area: 78.53981633974483  
Square area: 100  
Rectangle area: 600
```

