Object-oriented Programming in Java

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Department, Institutional Affiliation

Course Number and Name

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Due Date

Object-oriented Programming in Java

Object-oriented programming (OOP) in Java is a method or organization of a program using classes and objects. In other words, OOP is termed the core of Java (Great Learning Team, 2022). To define a data structure of object-oriented programming such as an array, their data type is defined. As a result, OOP improves code readability and reusability.

Inheritance, abstraction, polymorphism, and encapsulation are the main concepts of object-oriented programming. According to Singh 2020, inheritance is a process by which a class acquires properties from another class. Abstraction is a mechanism that utilizes and displays only the relevant attributes and hides any unwanted details. An object in OOP can be created in more than one form through a mechanism known as polymorphism. The encapsulation mechanism encloses methods, variables, and codes together in a single entity. Understanding how each of these concepts works creates a deeper understanding of what object-oriented programming entails.

A complex program in OOP is broken down into small units known as objects. Rabelo 2021, defines an object as an entity that has both state and behavior. An example of an object is a mountain bicycle that can inherit properties from a parent class, Bicycle. A mountain bicycle can have states such as first gear or idle and behaviors such as accelerating and stopping. As a result, an object is an instance of a class.

Demonstration of Object-oriented Programming in Java

The Bicycle Class

```java
public class Bicycle {
    int gear = 4;

    public void startEngine() {
        System.out.println ("Engine starting...");

    }
    public void stopEngine() {
        System.out.println ("Engine stopping...");

    }
}
```

Figure 1 The Bicycle class with a variable and two methods

Creating a Mountain Bicycle Object

```java


public class MountainBicycle {

    public static void main (String[] args)
    {
        Bicycle mountaiBicycle = new Bicycle();
        mountaiBicycle.startEngine();
        System.out.println (mountaiBicycle.gear);
        mountaiBicycle.stopEngine();
    }

}
```

Figure 2 The MountainBicycle class that creates an object of a mountainBicycle from the class Bicycle

The Output

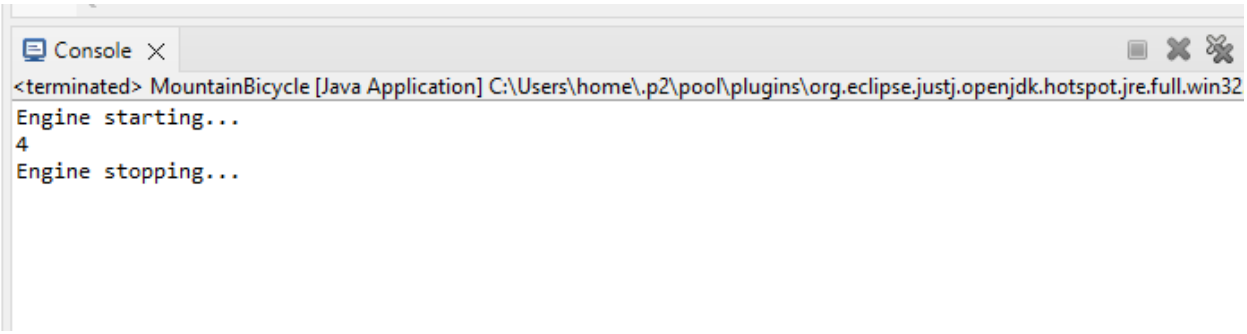

Figure 3 The output when an object is created

References

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