

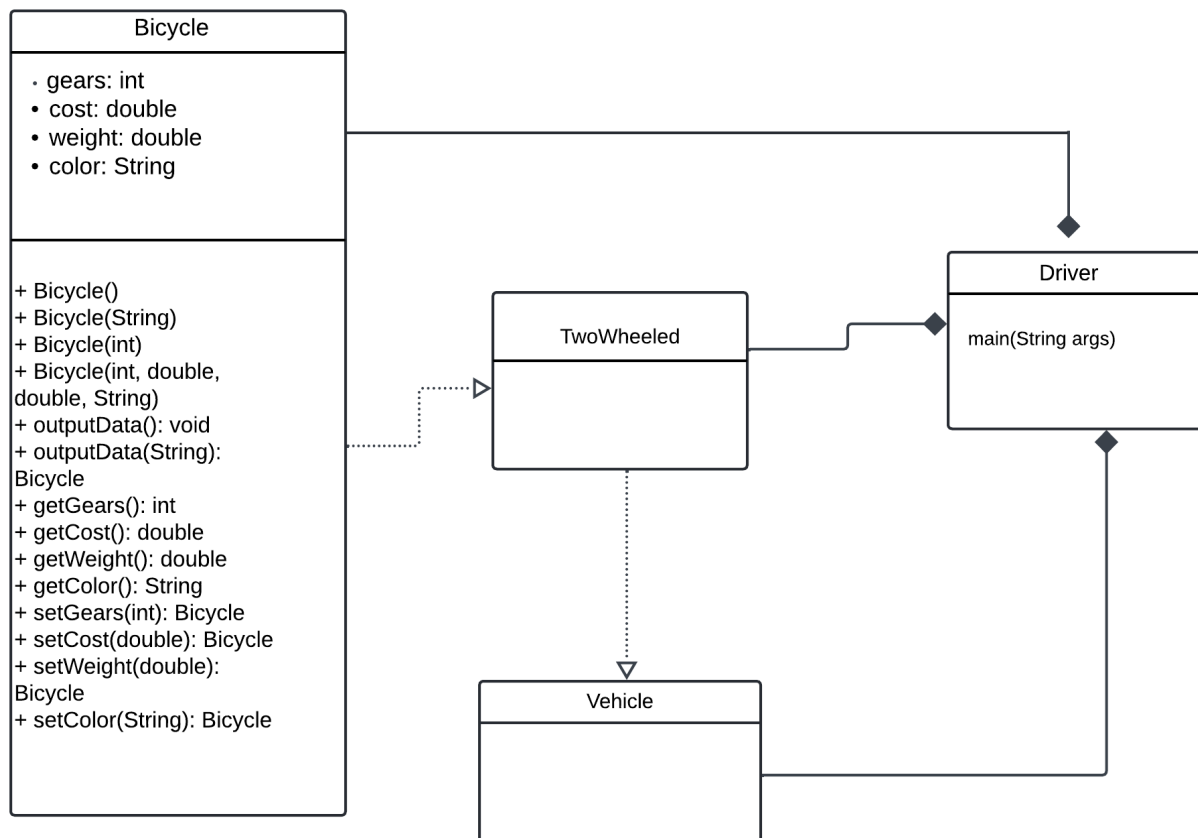
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1-5 Assignment: UML Diagrams



The UML class diagram for the `Bicycle` class illustrates several key object-oriented programming principles.

Firstly, it demonstrates encapsulation by encapsulating the class attributes (`gears`, `cost`, `weight`, `color`) within the class, which are declared as private (`-`), meaning they can only be

accessed or modified through public methods. This ensures data integrity and protects the internal state of the object.

Secondly, it showcases constructor overloading, where multiple constructors are defined with different parameter lists. This allows for the creation of `Bicycle` objects with various combinations of attributes, providing flexibility in object instantiation.

Additionally, the diagram exhibits method overloading, specifically with the `outputData()` method. There are two versions of this method, one without parameters and one with a `String` parameter, allowing for different ways to output the bicycle's information.

Moreover, it demonstrates method chaining by providing setter methods (`setGears()`, `setCost()`, `setWeight()`, `setColor()`) that return the instance of the `Bicycle` object, enabling consecutive method calls on the same object. This enhances code readability and reduces the number of lines needed to perform multiple operations on the object.

Overall, the class diagram exemplifies core principles of object-oriented design, such as encapsulation, constructor overloading, method overloading, and method chaining, which contribute to building modular, reusable, and maintainable code.