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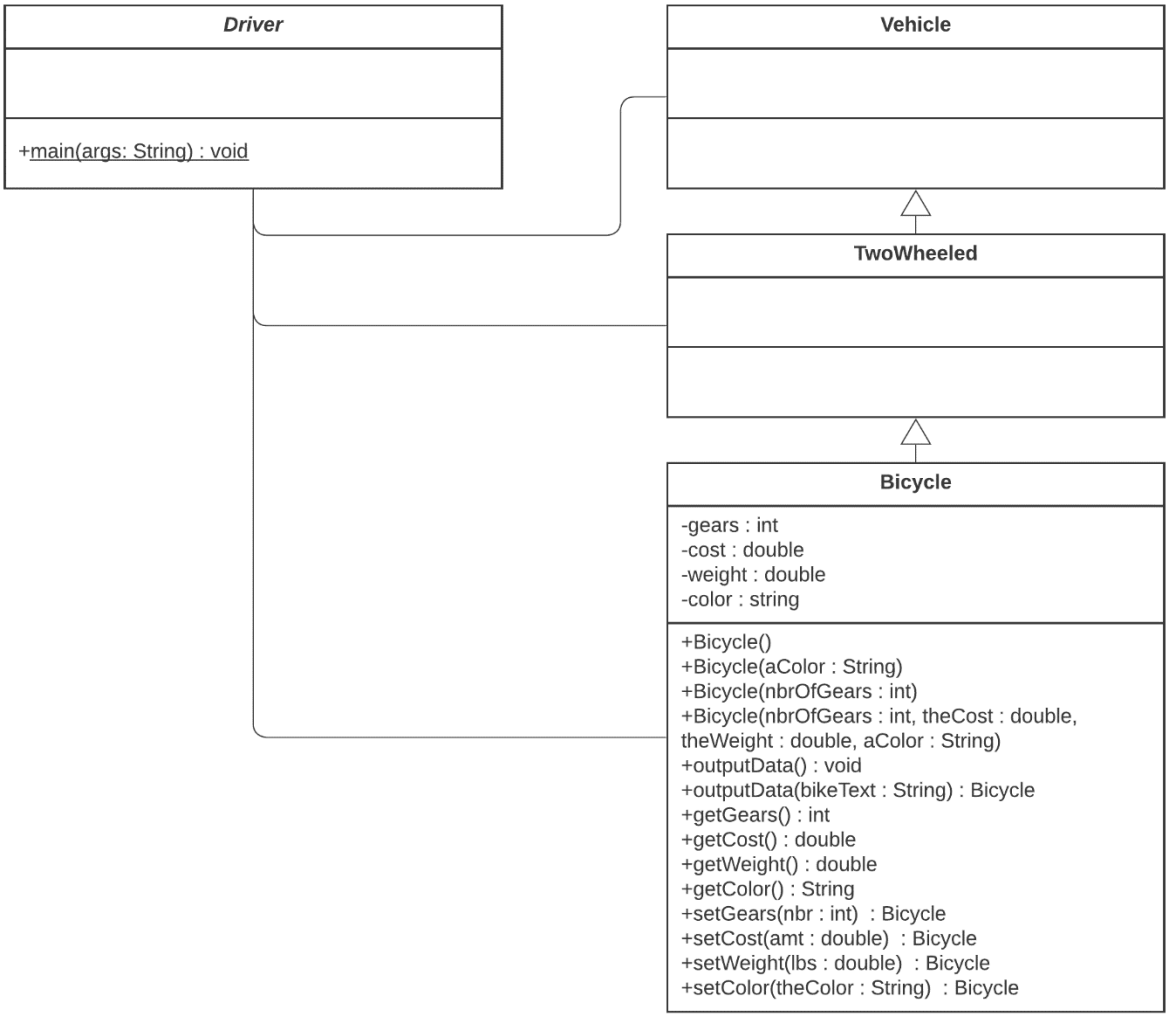
1-5 Assignment: UML Diagrams

The first benefit of object-oriented programming mentioned in the reading this week was portability. This is splitting up of code into classes, which not only helps to troubleshoot or identify problems within the code, but also helps to re-use code for other outside systems as it is all contained in one class. (Lavieri, 2019) This can be seen on the UML class diagram with the four separate classes: Driver, Vehicle, TwoWheeled, and Bicycle. Any of the classes can be reused in another system given all their attributes and methods are contained in one class. Next is the principle of inheritance, which helps to reduce reused code within a given program. This is done by having specific classes inherit from another class. In the UML class diagram, this is shown with open arrows leading from the class Bicycle to TwoWheeled and similarly from TwoWheeled to Vehicle. The third principal mentioned in the reading is encapsulation, which is the principle of limiting access to what is seen within a class. For instance, in the Bicycle class, all the attributes will be hidden due to their private nature, which is denoted by the minus sign before the attribute. Contrarily, all methods of the bicycle class are public which is denoted by the plus sign. The protected and package visibility options are also denoted by the hash and tilde, respectively. Lastly, polymorphism as defined in *Hands-On Design Patterns with Java* by Dr. Edward Lavieri is “generally defined as appearing in multiple forms. In OOP, polymorphism states that different types of objects can be accessed via a common interface.” (Lavieri, 2019)

Polymorphism allows for data to be processed in more than one form. This is shown within the Bicycle class of the UML class diagram as this class contains multiple constructors, i.e., overloading constructors as well as overloaded methods.



References:

Lavieri, D. E. (2019). *Hands-On Design Patterns with Java*. Packt Publishing. https://mbsdirect.vitalsource.com/books/9781789809954