Spring 2021

CS-240: Object-oriented Programming

Lab-14 Manual

Polymorphism

GIFT School of Engineering and Applied Sciences

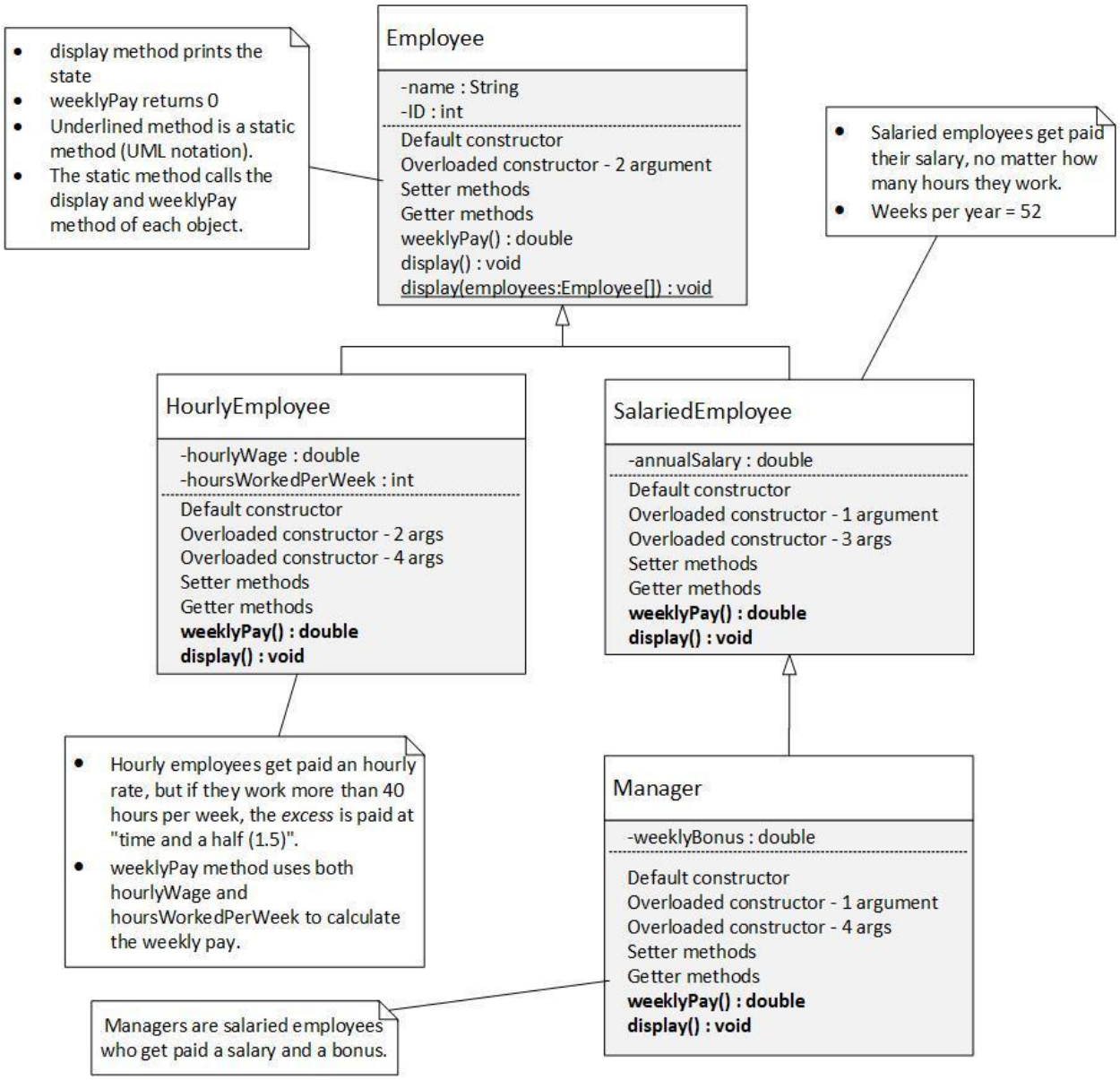
v1.3
3/30/2020

Task #1: Method Overriding and Polymorphism

In this task, you are being asked to create super and subclasses in Java. You will also be writing code that demonstrates creating subclasses, method overriding and polymorphism.

NOTE: Write your classes and the *main* method in separate files.

Convert the given UML diagram into classes depicting the inheritance hierarchy shown. Note that **bold methods** represent **overridden methods** in below UML diagram.



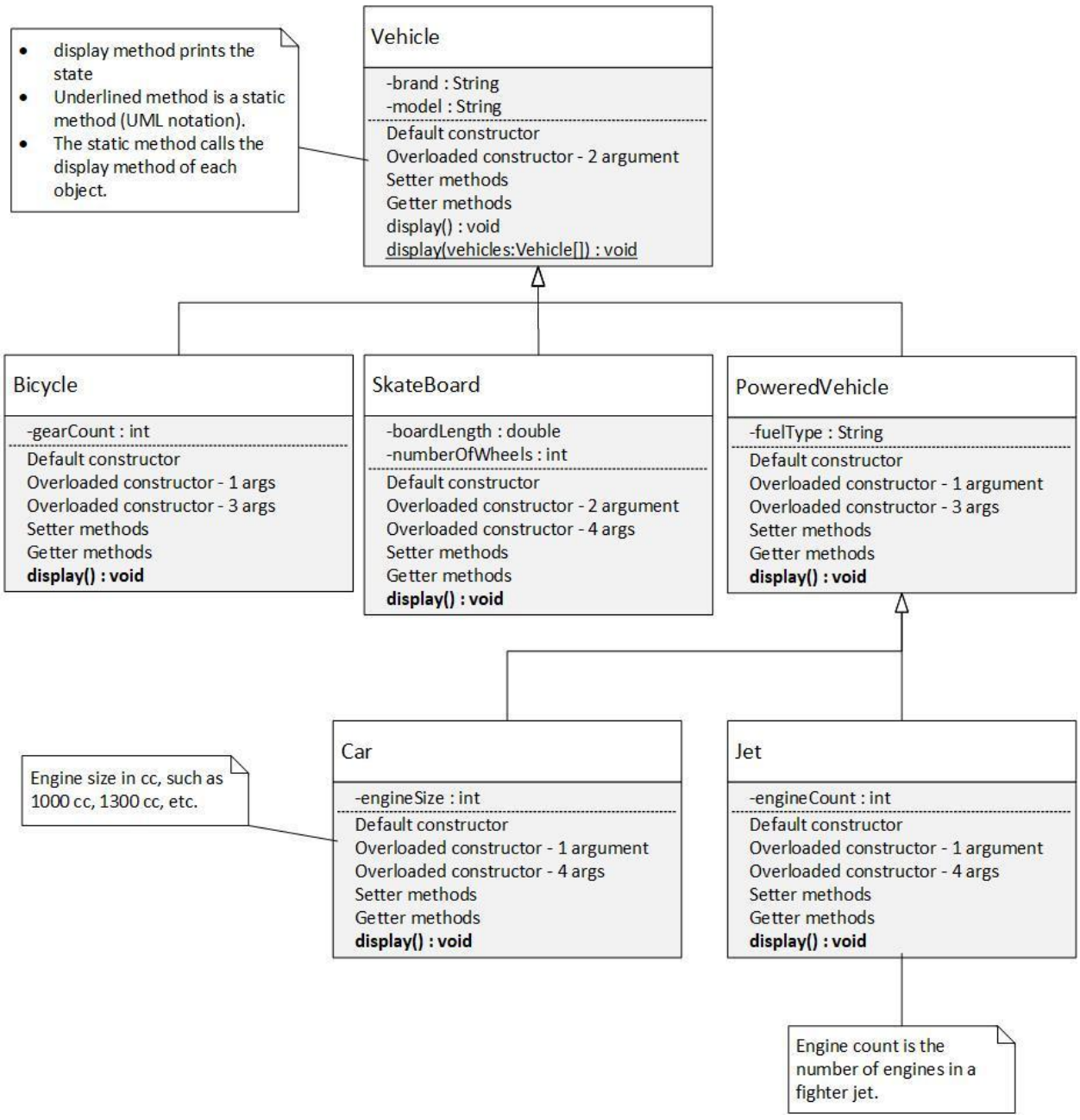
1. Create all classes having names as per the above diagram, and **`UsingEmployees.java`** having the **`main`** method**.**
2. Inside the **`main`** method, create instances of all subclasses using the default and overloaded constructors. Assign appropriate values to the state of all instances.
3. Display the state and weekly pay of all objects using the corresponding instance methods.
4. Create an array of **`Employee`** objects and assign each created **`Employee`** object (in **`Step-2`**) to an index of this array.
5. Now demonstrate the use of the static **`display`** method and polymorphism.

Task #2: Method Overriding and Polymorphism

In this task, you are being asked to create super and subclasses in Java. You will also be writing code that demonstrates creating subclasses, method overriding and polymorphism.

NOTE: Write your classes and the *main* method in separate files.

Convert the given UML diagram into classes depicting the inheritance hierarchy shown. Note that **bold methods** represent **overridden methods** in below UML diagram.



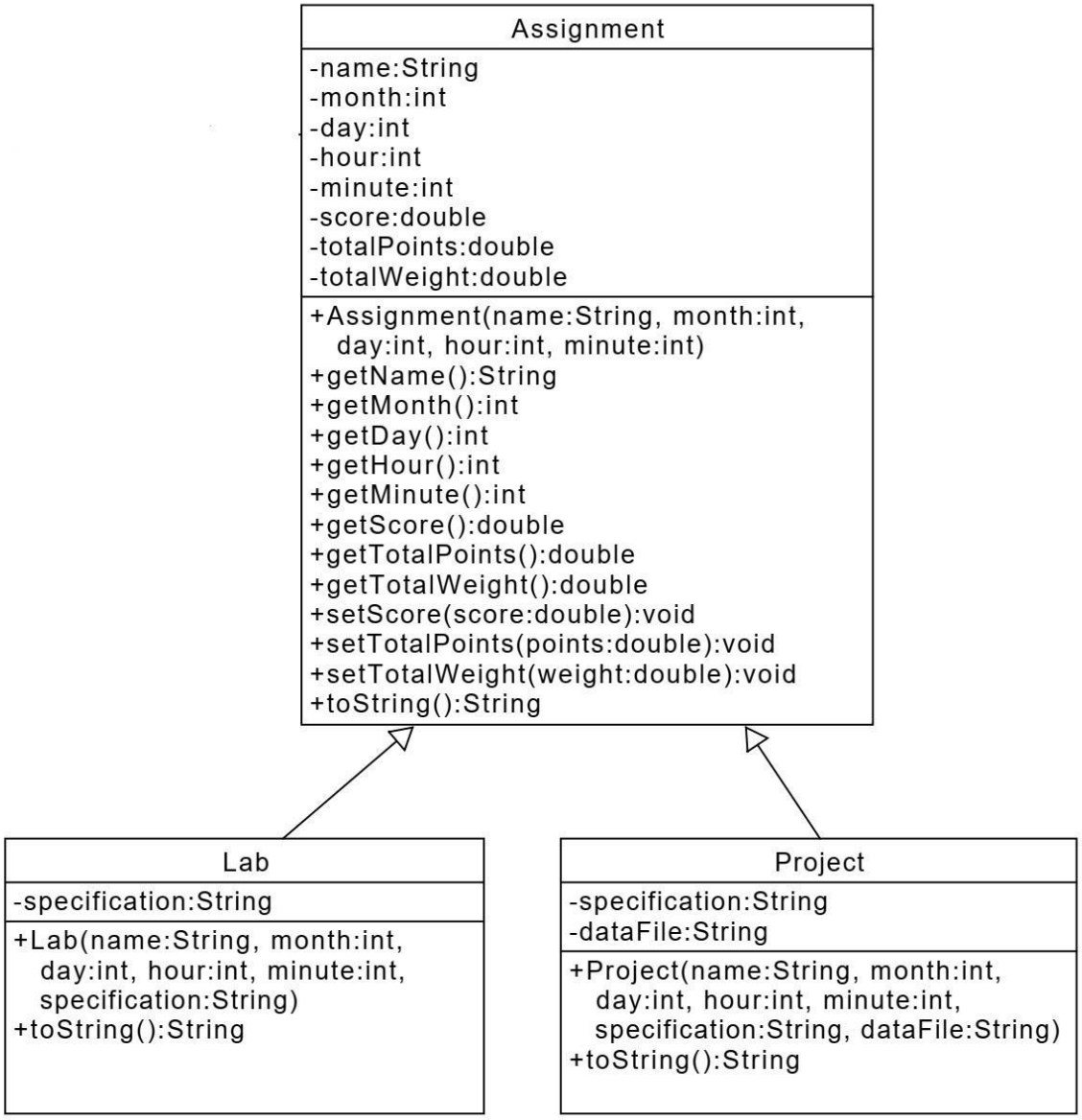
1. Create all classes having names as per the above diagram, and **`UsingVehicles.java`** having the **`main`** method**.**
2. Inside the **`main`** method, create instances of all subclasses using the default and overloaded constructors. Assign appropriate values to the state of all instances.
3. Create an array of **`Vehicle`** objects and assign each created **`Vehicle`** object (in **`Step-2`**) to an index of this array.
4. Now demonstrate the use of the static **`display`** method and polymorphism.

Task #3: Method Overriding and Polymorphism

In this task, you are being asked to create super and subclasses in Java. You will also be writing code that demonstrates creating subclasses, method overriding and polymorphism.

NOTE: Write your classes and the *main* method in separate files.

Convert the given UML diagram into classes depicting the inheritance hierarchy shown. Also, identify the methods that are overridden in the subclasses.



NOTES:

Please note the following description about the above UML diagram:

a) **`score`** is the number of points that you have received on the assignment,

b) **`totalPoints`** is the number of points that are possible for the assignment, and

c) **`totalWeight`** is the weight of this Assignment relative to other assignments.

d) Create a static method **`showAssignments(Assignment[] assignments)`** in the **`Assignment`** class that calls the **`toString()`** method of each **`Assignment`** object.

1. Create all classes having names as per the above diagram, and **`UsingAssignments.java`** having the **`main`** method**.**
2. Inside the **`main`** method, create instances of all subclasses using the default and overloaded constructors. Assign appropriate values to the state of all instances.
3. Create an array of **`Assignment`** objects and assign each created **`Assignment`** object (in **`Step-2`**) to an index of this array.
4. Now demonstrate the use of the static **`showAssignments`** method and polymorphism.