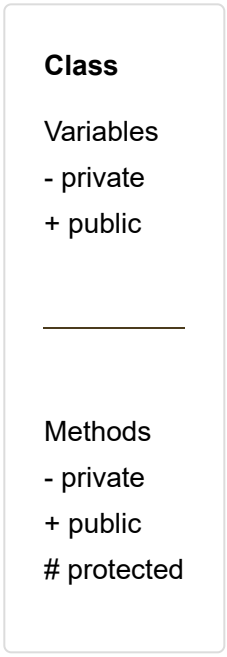
05.05 Virtual Lecture Notes (Part 2)

A class diagram is a graphic organizer that visually depicts the key properties of a class and the relationship with other classes. A generic example is shown below:



A class diagram is a simple way to graphically depict the components of a class. It consists of a rectangle with three compartments separated by two horizontal lines.

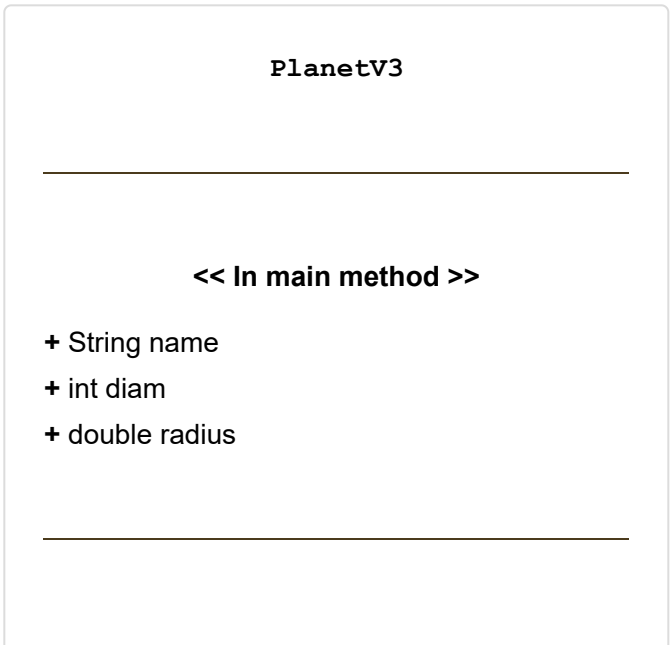
The top compartment indicates the name of the class, attributes are listed in the middle compartment, and the class's methods are shown in the lower compartment.

Attributes and methods may be preceded by a symbol to indicate their scope: public (+), private (-), or protected (#). Components may be annotated and grouped into categories or simply listed.

At a glance, this diagram reveals two important aspects of a class: attributes and behaviors.

Where does UML fit into the programming process? Pseudocode helps to abstract a general solution but is short on details. Once you have an idea of what you want to do, a class diagram helps identify and name specific attributes and behaviors: the variables and the methods. Flowcharting is more specific but should be limited to small segments of code if you need to trace the flow of control through decisions or loops. Never try to flowchart an entire object-oriented program!

The following class diagram corresponds to the `PlanetV3` program. What does it tell you?



<< Constructor >>

+ PlanetV3()

<< Methods >>

+ double calcRadius(double diameter)
+ void printPlanet(String n, double rad)

This class diagram tells you the following:

1. The name of the class is **`PlanetV3`**.
2. There are three public variables in the **`main()`** method; their names and types are listed.
3. There is a default constructor, named **`PlanetV3()`**.
4. There are two public methods; their names, return types, and parameter lists are provided.

Start making class diagrams *before* you start coding; you will be more organized and less confused. Armed with the class diagram shown above, it would not be difficult to write the PlanetV3 class.

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