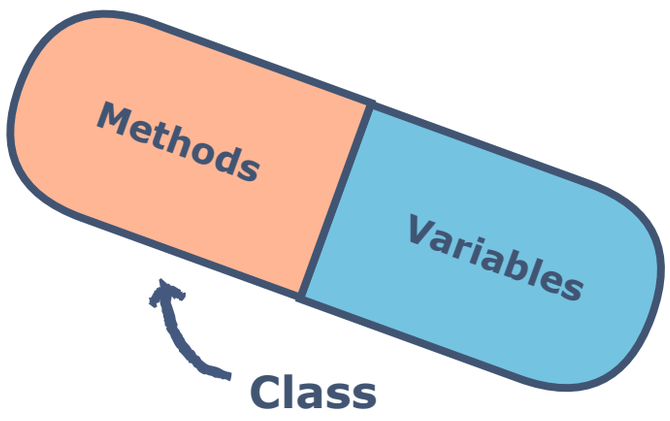
Definition#

Encapsulation is a fundamental programming technique in OOP used to achieve data hiding.

> **Encapsulation** in OOP refers to binding the **data** and the **methods to manipulate that data** together in a single **unit** (class).

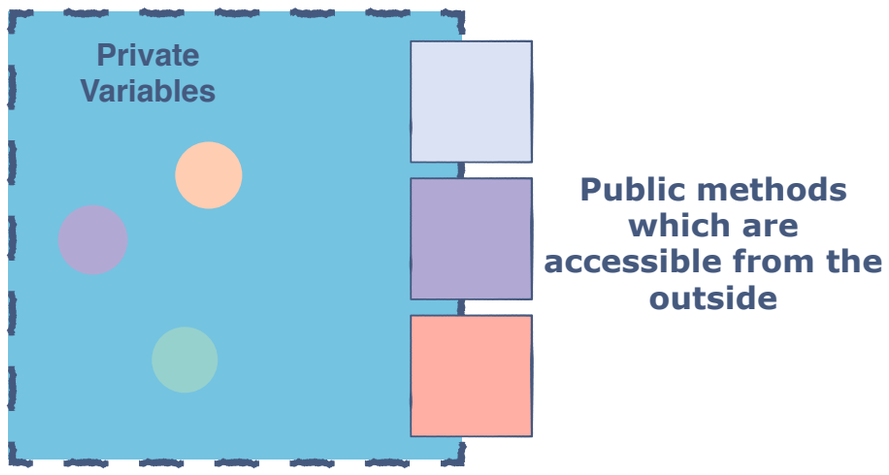
Depending upon this **unit**, objects are created. Encapsulation is normally done to hide the state and representation of an object from outside. A class can be thought of as a **capsule** having *methods* and *data members* inside it.



As a rule of thumb, a good convention is to declare all the *data members or instance variables* of a class `private`. This will restrict direct access from the code outside that class.

At this point, a question can be raised that if the methods and variables are encapsulated in a class then *"how can they be used outside of that class"*?

Well, the answer to this is simple. One has to implement `public` methods to let the outside world communicate with this class. These methods can be *getters*, *setters* and any other custom methods implemented by the programmer.



Advantages of Encapsulation#

- Classes are easier to change and maintain.
- We can specify which data member we want to keep hidden or accessible.
- We decide which variables have read/write privileges (increases flexibility).