Classes & Class Members

Creating templates for objects

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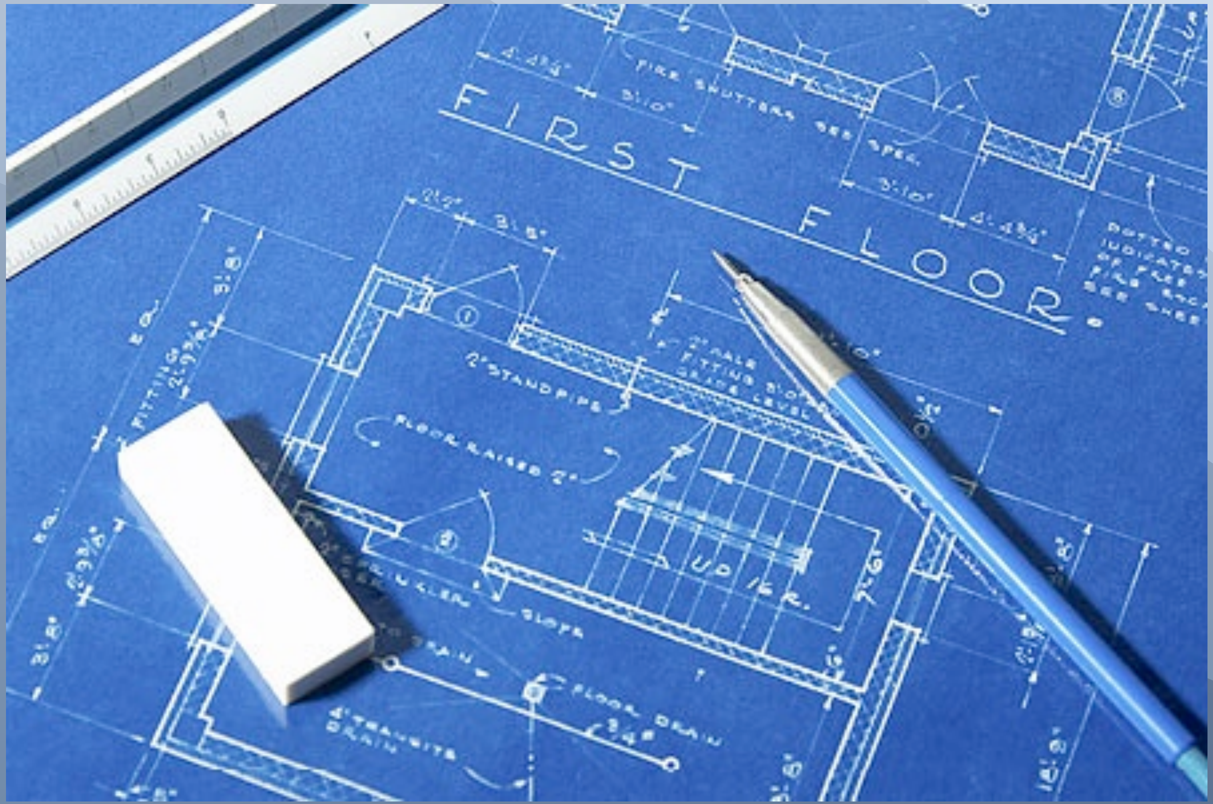
Classes

- A Class is a set of instructions for building an object, what traits the object has and what behaviors the object can *do*.



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Instances

- Many ***instances*** can be created from a class.
  - ✓ For Example: you might have a `contact_button` and an `about_button`, but they are both instances of a the class MyButton.

```
contact_button = Button()

about_button = Button()
```

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Class Members

- An object will expose information and functionality pertaining to that object in the form of:
  - Attributes
  - Properties (we will discuss in the Encapsulation lecture)
  - Methods

Attributes

- Attributes of an object are values that describe the characteristics of that object.
- Traits
- Variables
- Dot Syntax:
  - object.attribute = value;
- Attributes are objects, too, and can have properties of their own.
  - object. attribute. attribute = value;
  - object. attribute. attribute +=1;

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Access to Modifiers

Who can get to what?

- Public
  - accessible by any other object
  - `self.attribute`
- Private
  - accessible ONLY within the class it is defined
  - `self.__attribute (two underscores!!)`
- Protected
  - accessible by sub-classes.
  - `self._attribute`

Methods

- A method is a named block of code that can be called from other places in your program.
- Behaviors
- Functions
- Methods can accept input (called parameters or arguments) and provide output (by returning a value)
- Dot syntax:
    - object.method(value);
    - object.method();
    - object. attribute.method();

Constructor

- Catalyst
  - When an object is created this method runs immediately.
- Holds attributes available to the entire class.
-
```
def __init__(self):
```

Class Members

Attributes & Methods

```
class Main(object):
    def __init__(self):
        self.greeting = "Hello";
        self.changeGreetingToFrench();

    def changeGreetingToFrench(self):
        self.greeting = "Bonjour";
```

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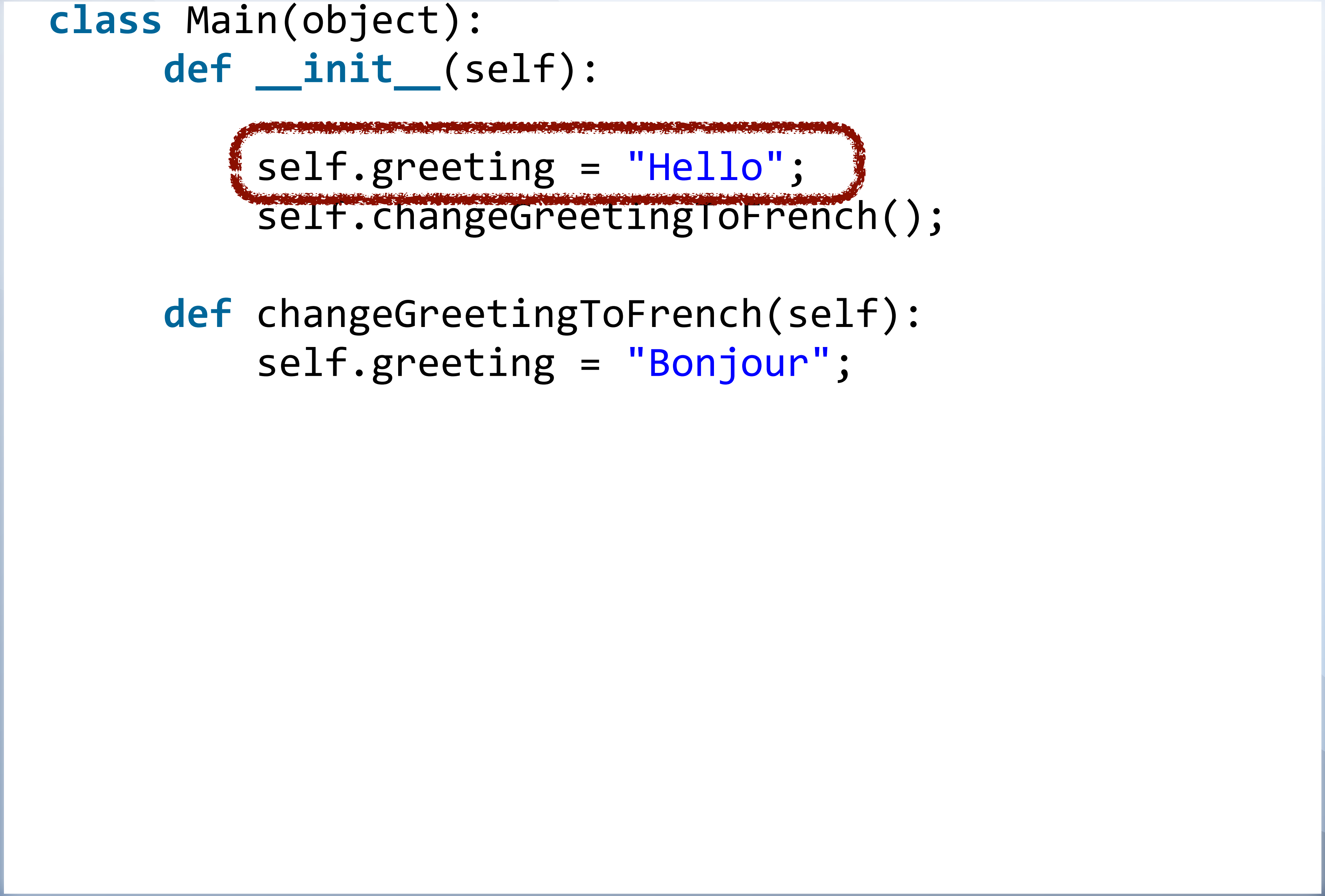
Class Members

Properties



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Class Members

Methods

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Review

- Classes are blueprints for instances
- Attributes are special variables for traits
- Methods are special functions for behaviors
- Constructor methods are for setting up an object