Object-Oriented Python: Takeaways

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Syntax

- Define an empty class:

```
class MyClass():

    pass
```

- Instantiate an object of a class:

```
class MyClass():

    pass

mc_1 = MyClass()
```

- Define an init function in a class to assign an attribute at instantiation:

```
class MyClass():

    def __init__(self, param_1):

        self.attribute_1 = param_1

mc_2 = MyClass("arg_1")
```

- Define a method inside a class and call it on an instantiated object:

```
class MyClass():

    def __init__(self, param_1):

        self.attribute_1 = param_1

    def add_20(self):

        self.attribute_1 += 20

mc_3 = MyClass(10) # mc.attribute is 10

mc.add_20()        # mc.attribute is 30
```

Concepts

- In **Object-Oriented Programming**, the fundamental building blocks are objects.
    - It differs from **Procedural** programming, where sequential steps are executed.

- An **object** is an entity that stores data.
- A **class** describes an object's type. It defines:
    - What data is stored in the object, known as attributes.
    - What actions the object can do, known as methods.
- An **attribute** is a variable that belongs to an instance of a class.
- A **method** is a function that belongs to an instance of a class.
- Attributes and methods are accessed using **dot notation**. Attributes do not use parentheses, whereas methods do.
- An **instance** describes a specific example of a class. For instance, in the code `x = 3`, `x` is an instance of the type `int`.
    - When an object is created, it is known as **instantiation**.
- A **class definition** is code that defines how a class behaves, including all methods and attributes.
- The init method is a special method that runs at the moment an object is instantiated.
    - The init method (`__init__()`) is one of a number of special methods that Python defines.
- All methods must include `self`, representing the object instance, as their first parameter.
- It is convention to start the name of any attributes or methods that aren't intended for external use with an underscore.

Resources

- Python Documentation: Classes

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