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Lecture No. 8: Python Classes

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Python Classes

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Python class:

Definition:

In Python, a class is a template for a data type. A class can be defined using the class keyword.

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Python class:

Example:

```
# Defining a class
class Animal:
    def _init_(self, name, number_of_legs) :
        self.name = name
#Output:
self.number_of_legs = number_of_legs
```

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Python repr method:

Definition:

The Python `_repr _()` method is used to tell Python what the string representation of the class should be. It can only have one parameter, `self`, and it should return a string.

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Python repr method:

Example:

```
class Employee:
def _init_(self, name):
self.name = name
def _repr_(self): return self.name
john = Employee('John')
print(john)
```

#Output:
John

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Python class methods:

Definition:

In Python, methods are functions that are defined as part of a class. It is common practice that the first argument of any method that is part of a class is the actual object calling the method. This argument is usually called self.

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Python class methods:

Example:

```
# Dog class
class Dog:
    # Method of the class
    def bark(self):
        print(" Ham-Ham")
    # Create a new instance
    charlie = Dog()
    # Call the method
    charlie.bark()
#Output:
" Ham-Ham"
```


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Instantiate Python Class:

Definition:

In Python, a class needs to be instantiated before use. As an analogy, a class can be thought of as a blueprint (Car), and an instance is an actual implementation of the blueprint (Ferrari).

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Instantiate Python Class:

Example:

```
class Car:  
    "This is an empty class"  
    pass  
#Output: Class Instantiation  
ferrari = Car()
```

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Python Class Variables:

Definition:

In Python, class variables are defined outside of all methods and have the same value for every instance of the class.

Class variables are accessed with the `instance.variable` or `class_name.variable` syntaxes.

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Python Class Variables:

Example:

```
class my_class :  
    class_variable = "I am a Class Variable!"  
x = my_class()  
y = my_class()  
print(x.class_variable)
```

#Output:

I am a Class Variable!

```
print(y.class_variable)
```

#Output:

I am a Class Variable!

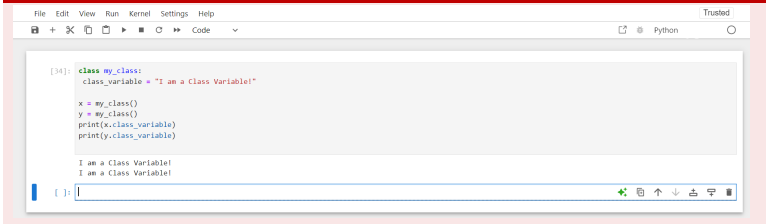
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Python Class Variables:

Output:



```
[34]: class my_class:
      class_variable = "I am a Class Variable!"

      x = my_class()
      y = my_class()
      print(x.class_variable)
      print(y.class_variable)

I am a Class Variable!
I am a Class Variable!
```

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Python init method:

Definition:

In Python, the `__init__()` method is used to initialize a newly created object. It is called every time the class is instantiated.

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Python init method:

Example:

```
class Animal:
    def _init_(self, voice):
        self.voice = voice
    # When a class instance is created, the instance variable
    # 'voice' is created and set to the input value.
    cat = Animal('Meow')
    print(cat.voice)
    # Output: Meow
    dog = Animal('Woof')
    print(dog.voice)
    # Output: Woof
```

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Python `type()` function:

Definition:

The Python `type()` function returns the data type of the argument passed to it.

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Python type() function:

Example:

- 1 `a = 1`
`print(type(a))` # Output: `< class'int' >`
- 2 `a = 1.1`
`print(type(a))` # Output: `< class'float' >`
- 3 `a = 'b'`
`print(type(a))` # Output: `< class'str' >`
- 4 `a = None`
`print(type(a))` # Output: `< class'NoneType' >`

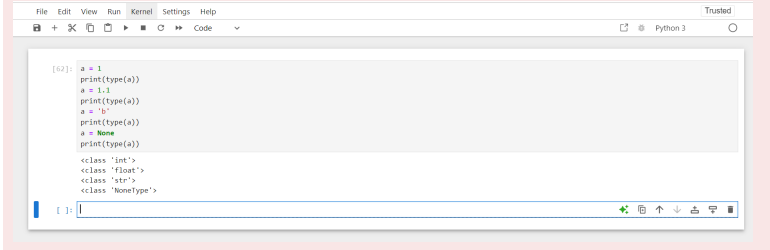
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Python type() function:

Output:



```
[62]: a = 1
      print(type(a))
      a = 1.1
      print(type(a))
      a = 'b'
      print(type(a))
      a = None
      print(type(a))

      <class 'int'>
      <class 'float'>
      <class 'str'>
      <class 'NoneType'>
```

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Python dir() function:

Definition:

In Python, the built-in dir() function, without any argument, returns a list of all the attributes in the current scope.

With an object as argument, dir() tries to return all valid object attributes.

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Python dir() function:

Example:

```
class Employee:
def _init_(self, name):
self.name = name
def print_name(self):
print("Hi, I'm " + self.name)
print(dir())
# Output: ['Employee', '_builtins_', '_doc_', '_file_',
'_name_', '_package_', 'new_employee']
```

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`_main_` in Python:

Definition:

In Python, `_main_` is an identifier used to reference the current file context. When a module is read from standard input, a script, or from an interactive prompt, its `_name_` is set equal to `_main_`.

Suppose we create an instance of a class called `CoolClass`. Printing the `type()` of the instance will result in:

```
< class' _main _ .CoolClass' >
```

This means that the class `CoolClass` was defined in the current script file.