

## Object Oriented Programming in Python | Set 1 (Class, Object and Members)

Below is a simple Python program that creates a class with single method.

```
# A simple example class
class Test:

    # A sample method
    def fun(self):
        print("Hello")

# Driver code
obj = Test()
obj.fun()
```

Output:

Hello

As we can see above, we create a new class using the class statement and the name of the class. This is followed by an indented block of statements which form the body of the class. In this case, we have defined a single method in the class.

Next, we create an object/instance of this class using the name of the class followed by a pair of parentheses.

### The self

1. Class methods must have an extra first parameter in method definition. We do not give a value for this parameter when we call the method, Python provides it
2. If we have a method which takes no arguments, then we still have to have one argument – the self. See fun() in above simple example.
3. This is similar to this pointer in C++ and this reference in Java.

When we call a method of this object as myobject.method(arg1, arg2), this is automatically converted by Python into MyClass.method(myobject, arg1, arg2) – this is all the special self is about.

### The \_\_init\_\_ method

The \_\_init\_\_ method is similar to constructors in C++ and Java. It is run as soon as an object of a class is instantiated. The method is useful to do any initialization you want to do with your object.

```
# A Sample class with init method
class Person:

    # init method or constructor
    def __init__(self, name):
        self.name = name

    # Sample Method
    def say_hi(self):
        print('Hello, my name is', self.name)

p = Person('Shwetanshu')
p.say_hi()
```

Output:

Hello, my name is Shwetanshu

Here, we define the \_\_init\_\_ method as taking a parameter name (along with the usual self). .

### Class and Instance Variables (Or attributes)

In Python, instance variables are variables whose value is assigned inside a constructor or method with self.

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Class variables are variables whose value is assigned in class.

```
# Python program to show that the variables with a value
# assigned in class declaration, are class variables and
# variables inside methods and constructors are instance
# variables.

# Class for Computer Science Student
class CSStudent:

    # Class Variable
    stream = 'cse'

    # The init method or constructor
    def __init__(self, roll):

        # Instance Variable
        self.roll = roll

# Objects of CSStudent class
a = CSStudent(101)
b = CSStudent(102)
```



```
print(a.stream) # prints "cse"
print(b.stream) # prints "cse"
print(a.roll)   # prints 101

# Class variables can be accessed using class
# name also
print(CSSStudent.stream) # prints "cse"
```

We can define instance variables inside normal methods also.

```
# Python program to show that we can create
# instance variables inside methods
```

```
# Class for Computer Science Student
class CSSStudent:
```

```
    # Class Variable
    stream = 'cse'
```

```
    # The init method or constructor
    def __init__(self, roll):
```

```
        # Instance Variable
        self.roll = roll
```

```
    # Adds an instance variable
    def setAddress(self, address):
        self.address = address
```

```
    # Retrieves instance variable
    def getAddress(self):
        return self.address
```

```
# Driver Code
```

```
→ a = CSSStudent(101)
  a.setAddress("Noida, UP")
  print(a.getAddress())
```

Output :

Noida, UP

### How to create an empty class?

We can create an empty class using **pass statement** in Python.

```
# An empty class
class Test:
    pass
```

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This article is contributed by **Shwetanshu Rohatgi**. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

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**sameer** • 3 months ago

i am new to python i am learning from geeks to geeks so while executing this program i am unable to get output .in class and instance variable while executing the program i am getting trace back error at a=CSStudent(101) the error is showing as constructor doesnt take arguments.

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**Mihir** • a year ago

The content is great and easily explained. I have a suggestion though, I think you should have used a different name for a parameter and an instance variable for illustration purposes, so that people get an idea how these two things differ.

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**Chirag Garg** • 2 years ago

what is meant by self

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**Muhammad Anisuzzaman** → Chirag Garg

• 3 months ago • edited

It is just a keyword. By using this keyword, you can access the instance variable of a class. You can use any word without self. But If you use self, it will be easier for reader.

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**Rahul** • 2 years ago

why we need empty classes??

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**zorb** → Rahul • 7 months ago

it has no purpose basically . if you want to create class but not yet you can create it and leave it empty. when return to it and fill it up

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**samar jeet** • 2 years ago

realy helpfull

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**Logic Heap** • 2 years ago • edited

You can find more description on Classes and objects through this lecture

<https://www.youtube.com/watch?v=...>

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**Pradeep Pai** • 3 years ago • edited

Can we overload the Constructors in python

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