Amit Machine Learning Diploma

Python: methods & args & OOP Concepts

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**Agenda:**

1. Dunder or Magic Methods
2. \*args & \*\*kwargs
3. Encapsulation
4. Abstraction
5. **Dunder or Magic Methods**

They are special methods that start and end with double underscores ( **\_\_** ).

They are not meant to be invoked directly by you, but the invocation happens internally from the class on a certain action.

To see the number of methods use **dir()** function.

Few examples for magic methods are: **\_\_init\_\_ , \_\_add\_\_ , \_\_len\_\_ , \_\_call\_\_ , \_\_new\_\_ , \_\_str\_\_** .

**\_\_init\_\_()** method:

You must have already used this method if you have worked with classes. The **\_\_init\_\_()** method is used to create an instance of the class.

**\_\_new\_\_()** method:

The **\_\_new\_\_()** method returns a new object, which is then initialized by **\_\_init\_\_()** .

**\_\_call\_\_()** method:

The **\_\_call\_\_()** method enables Python programmers to write classes where the instances behave like functions and can be called like a function.

**\_\_len\_\_()** method:

The **\_\_len\_\_()** method returns a positive integer that represents the length of the object on which it is called.

**\_\_str\_\_()** method:

The **\_\_str\_\_()** method returns a printable string representation of any user defined class.

**\_\_add\_\_()** method:

The **\_\_add\_\_()** method performs the addition of two attributes of the two objects.

1. **\*args & \*\*kwargs**

Passing a variable number of arguments to a function using special symbols.

**\*args** (Non Keyword Arguments):

Allow us to pass the variable number of non-keyword arguments to function.

We should use an asterisk **\*** before the parameter name to pass variable length arguments.

**\*\*kwargs** (Keyword Arguments):

Passes variable length non-keyword argument to function using **\*args** but we cannot use this to pass keyword argument. For this problem, Python has got a solution called **\*\*kwargs**, it allows us to pass the variable length of keyword arguments to the function.

We use the double asterisk **\*\*** before the parameter name to denote this type of argument.

Things to Remember:

**\*args** passes variable number of non-keyworded arguments and on which operation of the tuple can be performed.

**\*\*kwargs** passes variable number of keyword arguments dictionary to function on which operation of a dictionary can be performed.

**Both** make the function flexible and they are special keyword that allows function to take variable length argument.

1. **Encapsulation**

Wrapping up variables and methods into a single entity.

This puts restrictions on accessing variables and methods directly and can prevent the accidental modification of data.

Acts as protective layer by ensuring that access to wrapped data is not possible by any code outside the class.

Can be achieved by declaring the data members of a class either as private or protected

Private variables:

They are preceded by **two underscores**.

They can be only accessible from the methods of the class. In other words, they cannot be accessible from outside of the class.

Protect variables:

They are preceded by **single underscores**.

They can be accessed out of the class as well as in the derived class (modified too in derived class).

1. **Abstraction**

A process of handling complexity by hiding unnecessary information from the user.

Used to hide the irrelevant data/class in order to reduce the complexity.

**Recourses**:

* <https://www.tutorialsteacher.com/python/magic-methods-in-python#:~:text=Python%20%2D%20Magic%20or%20Dunder%20Methods,class%20on%20a%20certain%20action>
* <https://www.geeksforgeeks.org/__call__-in-python/?ref=lbp>
* <https://www.geeksforgeeks.org/dunder-magic-methods-python/?ref=lbp>
* <https://blog.finxter.com/python-__len__-magic-method/#:~:text=The%20Python%20__len__,the%20length%20of%20object%20x%20>
* <https://www.section.io/engineering-education/dunder-methods-python/#71-add>
* [https://www.programiz.com/python-programming/args-and-kwargs#:~:text=\*args%20passes%20variable%20number%20of,a%20dictionary%20can%20be%20performed](https://www.programiz.com/python-programming/args-and-kwargs#:~:text=*args%20passes%20variable%20number%20of,a%20dictionary%20can%20be%20performed).
* <https://www.geeksforgeeks.org/args-kwargs-python/>
* <https://www.pythontutorial.net/python-oop/python-private-attributes/>
* <https://www.geeksforgeeks.org/encapsulation-in-python/#:~:text=Encapsulation%20is%20one%20of%20the,the%20accidental%20modification%20of%20data>
* <https://www.mygreatlearning.com/blog/abstraction-in-python/#:~:text=What%20is%20Abstraction%20in%20Python,oriented%20programming%20(OOP)%20languages>
* <https://www.javatpoint.com/abstraction-in-python>