

Python Programming

Class and Object

Mostafa S. Ibrahim

Teaching, Training and Coaching since more than a decade!

Artificial Intelligence & Computer Vision Researcher

PhD from Simon Fraser University - Canada

Bachelor / Msc from Cairo University - Egypt

Ex-(Software Engineer / ICPC World Finalist)



So far

- So far we learned what is class and object
 - Class: group relevant data and methods in a single unit (e.g. Student/Book/Admin)
 - Object: we instantiate/create many objects from the class blueprint
- We studied built-in classes: int, float, list, str, tuple, dict, set
 - We learned about (im)mutability, in-place changes and memory name-value binding
- We learned how to
 - Create our own class and create several objects
 - Magic/Dunder methods
 - `__init__` for constructing a new object
 - `__str__` and `__repr__` for string representation of an object
 - To create our own attributes
 - To create our own methods and the difference with function

`__init__`

- A special (dunder/magic) method for assigning the class attributes
- `emp = Employee()`
- Behind the scene, **automatically**:
 - Python creates memory for the new object (like `new` in C++)
 - Python calls `__init__` method if exists
- It should not return anything (or technically `None`)
 - Otherwise: `TypeError`
- We can use default arguments, like any function

Naming Conventions

- Class Name follow camel casing
- Attributes and Methods follow snake casing
- Class name and attributes are typically **nouns**
 - UserManager, total_users
- Methods typically indicates actions (**verbs**)
 - compute_result, find_user...

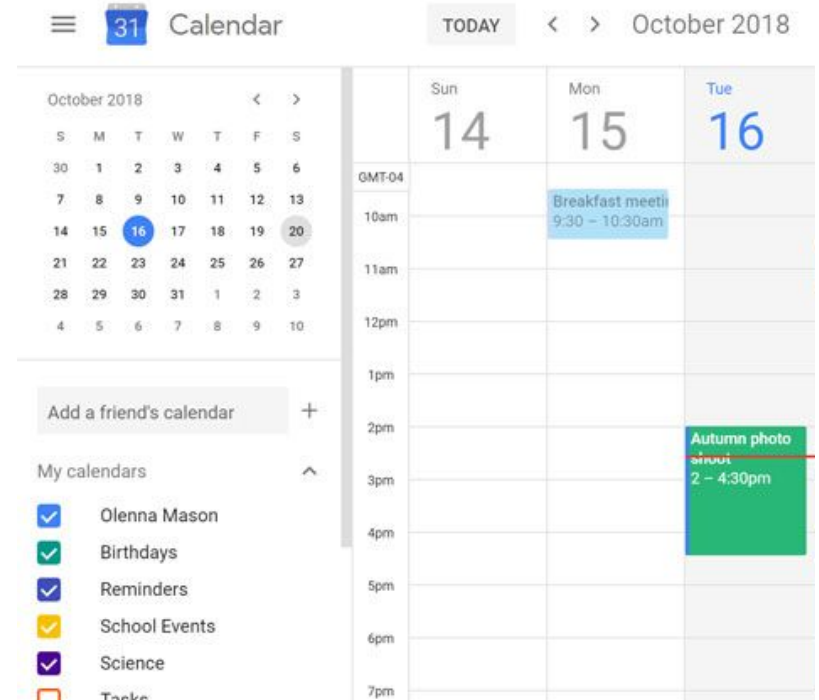
Encapsulation

- Encapsulation is the **grouping** of **variables and functions** of a specific concept in a single component, named class
 - Reduce system complexity
- In next section, we will highlight more about data-hiding in Python

Real-World as set of interacting objects



Elevators, Floors
Apartment: # of rooms and
washrooms.
Details of each room.
Locations of electricity outlets
and their details.
Grage details.



“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”