ASSIGNMENT - 10

Q1. What is the difference between \_\_getattr\_\_ and \_\_getattribute\_\_?

Ans: \_\_getattr\_\_(self, name) is invoked when an attribute that doesn’t exist is accessed. It’s called only when the attribute is not found through the normal lookup process.

\_\_getattribute\_\_(self, name) is called for every attribute access, whether the attribute exists or not. It's invoked before looking at the actual attributes of the object, which gives it broader functionality but requires caution to avoid infinite recursion.

Q2. What is the difference between properties and descriptors?

Ans: Properties: These are a high-level Pythonic way to use methods as attributes. They are defined on a per-attribute basis within a class. Properties allow you to define getter, setter, and deleter methods to manipulate the attribute's behavior, providing control over its access, assignment, and deletion.

Descriptors: Descriptors are a lower-level protocol used to define how attributes work. They are objects that define how attribute access is interpreted. Descriptors provide \_\_get\_\_, \_\_set\_\_, and \_\_delete\_\_ methods, allowing customization of attribute access behavior. Properties internally use descriptors to achieve their functionality.

Q3. What are the key differences in functionality between \_\_getattr\_\_ and \_\_getattribute\_\_, as well as properties and descriptors?

Ans: **\_\_getattr\_\_ vs. \_\_getattribute\_\_:**

* \_\_getattr\_\_ is invoked only when the requested attribute is not found through normal lookup, offering a chance to dynamically provide attribute values.
* \_\_getattribute\_\_ is called for every attribute access, offering a chance to intercept and customize attribute access globally within the class.

**Properties vs. Descriptors:**

* Properties provide a more straightforward way to define getter, setter, and deleter methods for specific attributes.
* Descriptors offer more flexibility and can be reused across multiple attributes and classes to control attribute access and behavior more extensively.

**Functionality differences:**

* \_\_getattr\_\_ and properties are more focused on specific attribute behavior and can be used to handle attribute access for individual attributes.
* \_\_getattribute\_\_ and descriptors provide a more global approach to attribute access, allowing for broader control but needing careful implementation to avoid unintended side effects or infinite loops.