Object Oriented Programming

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Class Policy

1-No one enters after I enter the classroom. If you are late, get a permission letter from the dept. office.

2- Put your phone on silent, and if you need to make a call or answer an important call, raise your hand and leave.

3- You are allowed to bring your water with you to drink and a snack to eat, with two conditions: you make no noises or bother your classmate.

4- I don't allow students to use gums except for specific conditions.

5- I'll take attendance (4 absences means failing in the course).

6- You have weekly quizzes for about 2 to 5 minutes about the materials we covered the previous week. We will collect these quizzes and give a couple of forgiveness excuses. Finally, we take the highest scores (for example, the top 13 quizzes).

7- I'll never forgive the student who cheated in my course.

8- The Phone is not allowed for taking pictures or recording audio; otherwise, I'll zero him/her in that week.

9- Don't try to send someone to make me change your score or treat you differently (it will not work, and it will just make me dislike you).

10- Have fun and enjoy programming (Hard workers will be rewarded, and slackers will not be).

Reference

Starting out with Python (2021) 5th Edition

by TONY GADDIS

Click here to download the book here

Python Coding Standards

Click here to download the book

OOP Principles

1- Encapsulation

Grouping related variables and functions that operate on them into an object is called encapsulation.

Benefits of encapsulation

- 1- simpler interface (not too many parameters).
- 2- reuse objects in different parts of a program or in different programs

OOP Principles

2- Abstraction

- Let us look at the DVD player as an object this DVD player has a complex logic board inside and a few buttons on the outside that you interact with, you simply press the play button and don’t care what happens on the inside, that complexity is hidden from you. This is Abstraction.
- We can use the same technique in our objects so that we can hide some of the properties and methods from the outside and this gives us a couple of benefits.

1-make the interface of the objects simpler using, understanding an object with few properties and methods is easier than an object with several properties and methods.
2- help us to reduce the impact of change. If we made any changes to the object in the future (changing parameters, methods, or deletion) will not impact the rest of the applications that use that object.

OOP Principles

3- Inheritance

- Is a mechanism that allows you to eliminate redundant code.
- As an example think of HTML elements. All the elements have common properties like(hidden and inner HTML) and methods like (click and focus).
- Instead of redefining all these properties and methods for every type of HTML element, we can define them once in a generic object called an HTML element and other objects inherit these properties and methods.

OOP Principles

4- Polymorphism

- Poly means Many, and morph means Shape
- In OOP Polymorphism is a technique that provides a method of creating multiple forms of a function by using a single function name.
- Back to the HTML example, all these objects have the ability to be rendered on a page, but, the way each element is rendered is different from others.
- In OOP we can implement a render method in each of these objects. Thus, the render method will behave differently depending on the type of object you are referencing.

BENEFITS OF OOP

- Encapsulations: Reduce complexity + Increase reusability.
- Abstraction: Reduce complexity + Isolate the impact of changes.
- Inheritance: Eliminate redundant code.
- Polymorphism: Makes programming more intuitive and easier.

Thank You!