UNIVERSITY OF CALOOCAN CITY
Caloocan, 1400 Metro Manila, Philippines

COLLEGE OF ENGINEERING
Computer Engineering
2nd Semester, School Year 2024-2025

Object-Oriented Programming

Laboratory Activity No. 1

Review of Technologies

Submitted by:
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Saturday 12:00pm to 8:30pm / CpE 1-A

Submitted to
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Instructor

Date Performed:
18-01-2025

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18-01-2025

I. Objectives

In this section, the goals in this laboratory are:

- To define the key terms in Object-oriented programming
- To be able to know the construction of OO concepts in relation to other types of programming such as procedural or functional programming

II. Methods

General Instruction:

A. Define and discuss the following Object-oriented programming concepts:

1. Classes: A type of data specified by the user is called a class. By creating an instance of that class, one can access and utilize its internal functions and data elements. It stands for the collection of characteristics or functions shared by all objects of a particular type. A class functions similarly to an object's blueprint.
2. Objects: It represents actual entities and is a fundamental component of object-oriented programming. An instance of a class is called an object. Memory is allocated when a class is created, or when an object is formed, but not when it is defined. Every object has a state, identity, and behavior. The information and the code needed to work with the data are contained in every object. It is necessary to know the type of message that the objects accept and the sort of response that they provide for them to interact.
3. Fields: Within an object or class, fields also referred to as attributes or variables are used to store data. They stand in for the traits or qualities connected to an item. Various data kinds, including strings, numbers, and custom objects, can be stored in fields. They supply the data or state that objects work with or manipulate.
4. Methods: In object-oriented programming, a method is the counterpart of a function. What a variable is to a method the actions that carry out operations on a variable. When a method is invoked on an object, it takes parameters as arguments, works with them, and then outputs the results. Although methods and functions are comparable, methods are also categorized based on their class design purpose.

5. Properties: One of the most crucial and significant aspects of object-oriented programming is properties. Properties mean that just the most important information about the data is made available to the general, with implementation or background details kept concealed.

III. Results

This diagram represents the core principles of Object-Oriented Programming (OOP). Each box is an object, containing its name, attributes (data), and behaviors (methods). Objects encapsulate their data and only expose behaviors for interaction, promoting encapsulation.

The arrows labeled "messages" depict how objects communicate by sending and receiving messages, typically through method calls. This illustrates how objects collaborate to achieve system functionality.

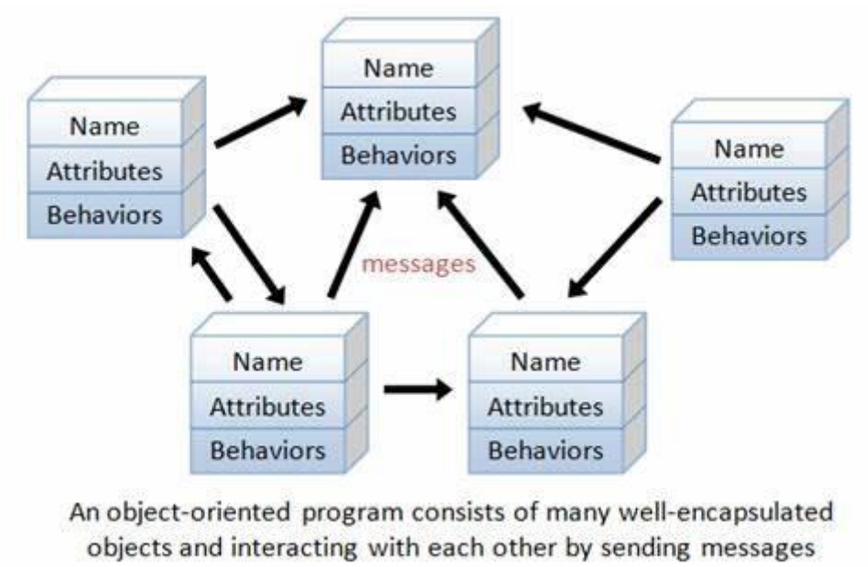

Figure 1. Agent Exchange – Virtual Trading Environment

E. H. Chua, "Python Tutorial - Object-Oriented Programming (OOP)," Nanyang Technological University. [Online]. Available: https://www3.ntu.edu.sg/home/ehchua/programming/webprogramming/Python1a_OOP.html. [Accessed: Jan. 18, 2025].

Because each object is self-contained and reusable in various situations, the diagram also emphasizes modularity and reusability. It embodies fundamental OOP ideas like polymorphism, inheritance, and abstraction, which allow for dynamic object interactions in a system that is adaptable and scalable.

IV. Conclusion

To sum up, classes, objects, fields, methods, and properties are the core ideas of object-oriented programming (OOP), which combines these ideas to efficiently organize and manage data. A class acts as a blueprint that specifies the common traits and capabilities of objects, which are real instances that are derived from the class. Fields in objects store information and serve as representations of the characteristics of the entities they represent. Like functions, methods work according to the design of the class and specify actions that can be taken on the data of an object. The most crucial parts of an object's data are encapsulated in its properties, which conceal the implementation specifics from the public. When combined, these ideas enable effective abstraction, data management, and interaction in OOP systems.

Reference

Book

Website:

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[2] Brilliant.org, "Methods in Object-Oriented Programming," Brilliant. [Online]. Available: https://brilliant.org/wiki/methods-oop/. [Accessed: Jan. 18, 2025].

[3] Stack Overflow, "OOP Terminology: class, attribute, property, field, data member," Stack Overflow. [Online]. Available: https://stackoverflow.com/questions/16751269/oop-terminology-class-attribute-property-field-data-member. [Accessed: Jan. 18, 2025].

[4] E. H. Chua, "Python Tutorial - Object-Oriented Programming (OOP)," Nanyang Technological University. [Online]. Available: https://www3.ntu.edu.sg/home/ehchua/programming/webprogramming/Python1a_OOP.html. [Accessed: Jan. 18, 2025].

[5] GeeksforGeeks. [Online]. Available: https://www.geeksforgeeks.org/differences-between-procedural-and-object-oriented-programming/?ref=ml_lbp. [Accessed: Jan. 18, 2025].