



UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT



Data Structure and Algorithm

Laboratory Activity No. 1

Object-oriented Programming

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I. Objectives

This laboratory activity aims to implement the principles and techniques in object-oriented programming specifically through:

- Identifying object-orientation design goals
- Identifying the relevance of design pattern to software development

II. Methods

- Software Development
 - o The design steps in object-oriented programming
 - o Coding style and implementation using Python
 - o Testing and Debugging
 - o Reinforcement of below exercises

A. Suppose you are on the design team for a new e-book reader. What are the primary classes and methods that the Python software for your reader will need? You should include an inheritance diagram for this code, but you do not need to write any actual code. Your software architecture should at least include ways for customers to buy new books, view their list of purchased books, and read their purchased books.

B. Write a Python class, Polygons that has three instance variables of type str, int, and float, that respectively represent the name of the polygon, its number of sides, and its area. Your class must include a constructor method that initializes each variable to an appropriate value, and your class should include methods for setting the value of each type and retrieving the value of each type.

III. Results

A.

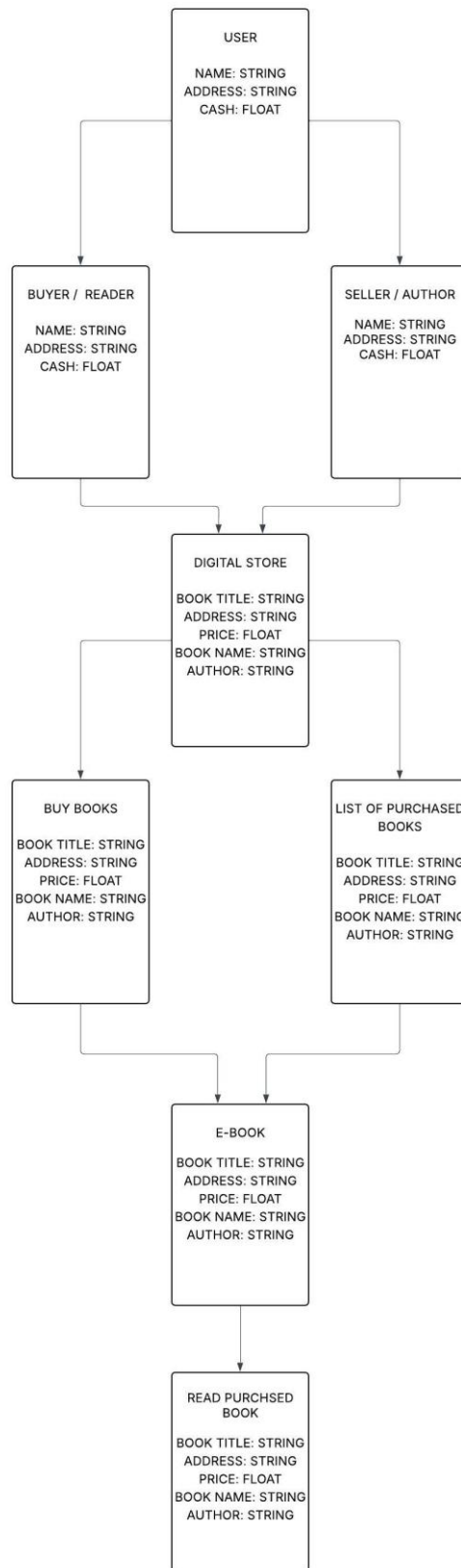


Figure 1 Flowchart

B.



```
Algorithm 1
:
radius = input("Enter Radius: ")
radius = float(radius)
pi = 3.14159

area = (pi * radius * radius)

print(f"The area of circle is {area:.2f}")

Enter Radius: 12
The area of circle is 452.39

Algorithm 2
:
diameter = input("Enter Diameter: ")
diameter = float(diameter)
pi = 3.14159

radius = (diameter / 2)

area = (pi * radius * radius)

print(f"The area of circle is {area:.2f}")

Enter Diameter: 24
The area of circle is 452.39
```

Figure 2 Input and Output

IV. Conclusion

In this laboratory activity, I was able to apply the basic ideas of object-oriented programming. I learned how to identify the main goals of object-oriented design and why they are important in building good programs. I also understood how design patterns help make software development easier, more organized, and more efficient. Overall, this activity helped me see how OOP and design patterns work together to create better and more useful programs.