



**UNIVERSITY OF CALOOCAN CITY**  
*Caloocan, 1400 Metro Manila, Philippines*

**COLLEGE OF ENGINEERING**  
**Computer Engineering**  
*2<sup>nd</sup> Semester, School Year 2024-2025*



# LABORATORY MANUAL

## Object-Oriented Programming (CPE 103)



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### **Laboratory Activity No. 2.2**

#### **Literals, Operators, and Variables-Supplementary Activity**

<b>Course Code:</b> CPE103	<b>Program:</b> BSCPE
<b>Course Title:</b> Object-Oriented Programming	<b>Date Performed:</b> 02/01/2025
<b>Section:</b> CPE 1-A NORTH	<b>Date Submitted:</b> 02/01/2025
<b>Name:</b> PALMES, LEWIS CLARK L.	<b>Instructor:</b> Engr. Maria Rizette Sayo
<b>1. Objective(s):</b>	
The main objectives of this activity are to implement literals and variables in a Python program. This involves understanding the distinction between literals, variables, and constants. Students will practice using variables to store and manipulate data, and they will write a program that includes comments to improve readability and maintainability.	
<b>2. Intended Learning Outcomes (ILOs):</b>	
By the end of this activity, students should be able to write a simple program that effectively uses variables to store and process data, utilizing different data types such as integers, floats, strings, and booleans. Additionally, students will learn to comment their code to explain its functionality, which enhances understanding and future maintenance. They will also be able to identify and use keywords in Python, such as def, if, else, return, and understand their role in the program.	
<b>3. Discussion:</b>	
In this activity, we will discuss the use of variables, constants, and literals in a Python program. Variables are containers for storing data values and are created by assigning a value to an identifier. They can store different data types, such as numbers, strings, lists, and dictionaries. For example, student_name = Clark is a variable assignment. Constants hold values that should not change during the program's execution. Although Python does not have a built-in constant type, by convention, constant names are written in all uppercase letters, like PI = 3.14159. Literals, on the other hand, are the fixed values assigned to variables or constants. Types of literals include numeric literals (e.g., integers and floats), string literals (e.g., Hello, World), boolean literals (True, False).	
<b>4. Materials and Equipment:</b>	



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Desktop Computer with Anaconda Python  
/Python Colab Windows Operating System

#### **5. Procedure:**

##### **Perform the activity using the Jupyter Notebook**

This activity can be done either locally on Anaconda's Jupyter Notebook or online through Google Collaboratory which offers a free Jupyter Notebook environment for Google Users. IPython Notebook files (.ipynb) that are saved in Google Drive can be opened on Google Collaboratory. Additional guides are available on the IPython Notebook template file that is provided with this activity. If the template is not present, these are the valuable links for reference:



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<https://jupyter-notebook.readthedocs.io/en/stable/examples/Notebook/Notebook%20Basics.html>  
<https://colab.research.google.com/notebooks/welcome.ipynb>  
[https://colab.research.google.com/notebooks/markdown\\_guide.ipynb](https://colab.research.google.com/notebooks/markdown_guide.ipynb)

## 1. Tasks:

1. A teacher wants to calculate the final grade in a CpE course and want to write it in a python program. The following are the requirements:

1. PRELIM GRADE = 40% Prelim Exam + 60% Prelim Class Standing (CS)
2. PRELIM CS = 50% Hands-on activity + 30% Quiz + 20% Assignment
3. MIDTERM GRADE = 1/3 of PRELIM GRADE + 2/3 of (50% Midterm Exam + 50% Midterm Class Standing (CS))
4. MIDTERM CS = 50% Hands-on activity + 30% Quiz + 20% Assignment
5. FINAL GRADE = 1/3 of MIDTERM GRADE + 2/3 of (50% Final Exam + 50% Final Class Standing (CS))
6. FINAL CS = 50% Hands-on activity + 30% Quiz + 20% Assignment
7. HOAs, Quizzes and Assignments are inputted as average of all submissions and are out of 100%.
8. Major exams are inputted out of 100%.
9. Show the codes that successfully run the program.
10. Provide comments or documentation strings for your program.



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**6. Supplementary Activity:**



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### Tasks

1. Test 3 students from the program you created.
2. The program should show the name of the student, the PRELIM, MIDTERM and FINAL grades.
3. Convert the final grade into the UCCs numerical grade. Please refer to the grading system.

refer to this link for the program:

[https://github.com/Lewis-Clark-Palmes/CPE-103-OOP-1-A/blob/main/Literals%2C\\_Operations%2C\\_and\\_Variables.ipynb](https://github.com/Lewis-Clark-Palmes/CPE-103-OOP-1-A/blob/main/Literals%2C_Operations%2C_and_Variables.ipynb)

### Questions:

1. **How does Python handle the distinction between literals, variables, and constants?**

Python handles literals as fixed values directly assigned to variables. Variables are containers for storing data values, created by assigning a value to an identifier. Constants hold values that should not change during the program's execution, conventionally written in uppercase, although Python does not have a built-in constant type.

2. **What are some ways to improve the readability and maintainability of Python code?**

Improving readability and maintainability of Python code can be achieved by adding comments to explain code functionality, using descriptive variable names, adhering to consistent naming conventions, organizing code into functions, and following the PEP 8 style guide.

3. **Which Python keywords did you identify and use in your program, and what are their roles?**

def: Defines a function.

if: Used for conditional statements.

else: Used for alternative conditional statements.

return: Exits a function and returns a value.

4. **How did writing a simple program utilizing various data types like integers, floats, strings, and booleans help you understand Python's dynamic typing?**

Writing a simple program with different data types helped me understand Python's dynamic typing by demonstrating how variables can store various data types without explicit type





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declarations. It showed how Python handles type inference and performs operations based on the variable's value type.

**5. How did this lab activity prepare you for more advanced stages of programming and application development in Python?**

This lab activity prepared me for advanced programming by establishing a strong foundation in Python's basic concepts, such as variables, data types, and operators. The hands-on experience with writing, manipulating, and documenting code has equipped me with the skills necessary for tackling more complex programming tasks and application development.



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**7. Conclusion:** This lab activity successfully met its main objective of implementing literals and variables in a Python program. By engaging in the exercises, I have effectively learned how to store and manipulate data using variables, as well as the distinction between literals, variables, and constants. I also practiced adding comments to improve the readability and maintainability of the code.

Additionally, I was able to achieve the intended learning outcomes by writing a simple program that utilized various data types such as integers, floats, strings, and booleans. This program was also appropriately commented on to enhance understanding and future maintenance. Furthermore, I identified and used key Python keywords such as `def`, `if`, `else`, and `return`, understanding their role in the program.

Overall, this activity has strengthened my foundational knowledge of Python programming, preparing me for more advanced stages of programming and application development. The hands-on experience with Python's syntax and dynamic typing furthered my appreciation for the language's simplicity and versatility in computational tasks.

**8. Assessment Rubric:**