AI ASSISTED CODING

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BATCH – 03 **07 – 01 – 2026**

ASSIGNMENT – 1.1

Lab 1: Environment Setup – GitHub Copilot and VS Code Integration + Understanding AI-assisted Coding Workflow Lab Objectives:

To install and configure GitHub Copilot in Visual Studio Code.
To explore AI-assisted code generation using GitHub Copilot.
To analyze the accuracy and effectiveness of Copilot's code suggestions.
To understand prompt-based programming using comments and code context.

Lab Outcomes (LOs):

After completing this lab, students will be able to:

Set up GitHub Copilot in VS Code successfully.
Use inline comments and context to generate code with Copilot.
Evaluate AI-generated code for correctness and readability.
Compare code suggestions based on different prompts and programming styles.

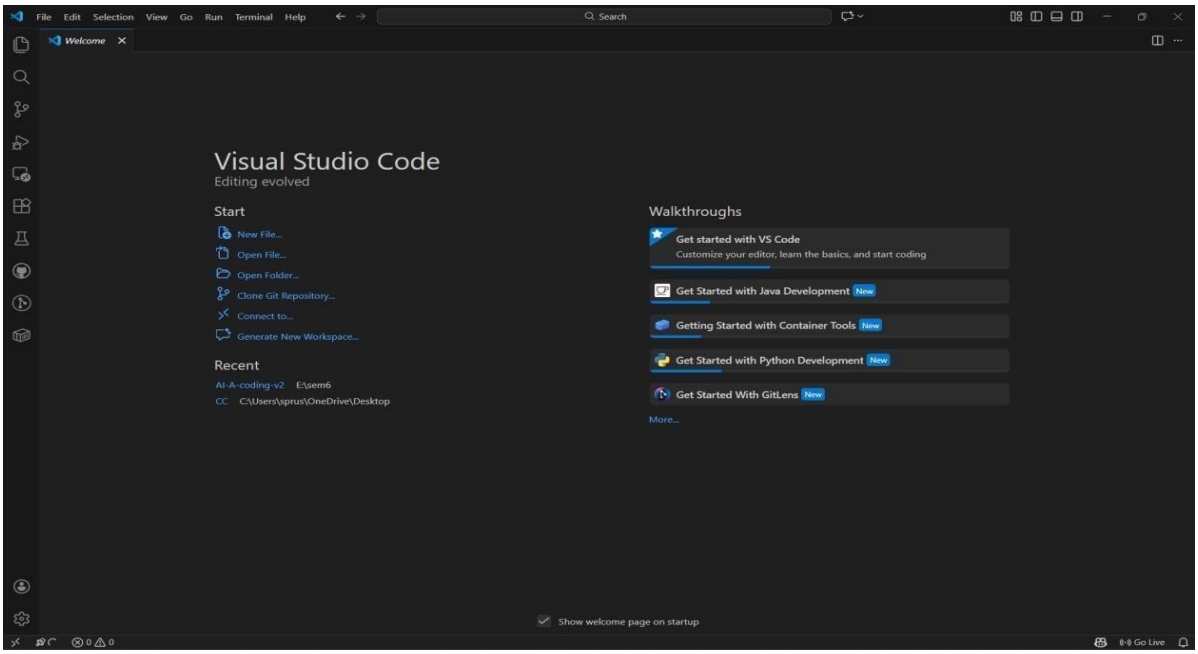
Task 0

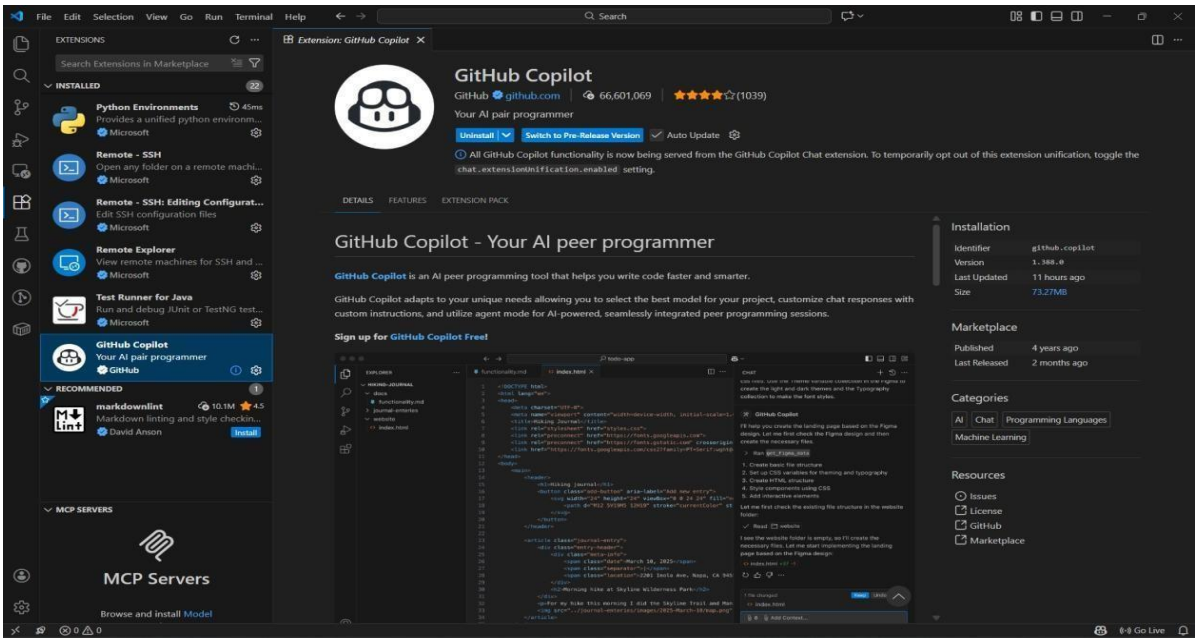
- **Install and configure GitHub Copilot in VS Code. Take screenshots of each step.**

Expected Output

- **Install and configure GitHub Copilot in VS Code. Take screenshots of each step.**

Task 0: Environment Setup:-





Task 1: AI-Generated Logic Without Modularization (Factorial without Functions)

- **Scenario**

You are building a small command-line utility for a startup intern onboarding task. The program is simple and must be written quickly without modular design.

- **Task Description**

Use GitHub Copilot to generate a Python program that computes a mathematical product-based value (factoriallike logic) directly in the main execution flow, without using any user-defined functions.

- **Constraint:**

➢ **Do not define any custom function**

➢ **Logic must be implemented using loops and variables only**

- **Expected Deliverables**

➢ **A working Python program generated with Copilot assistance ➢ Screenshot(s) showing:**

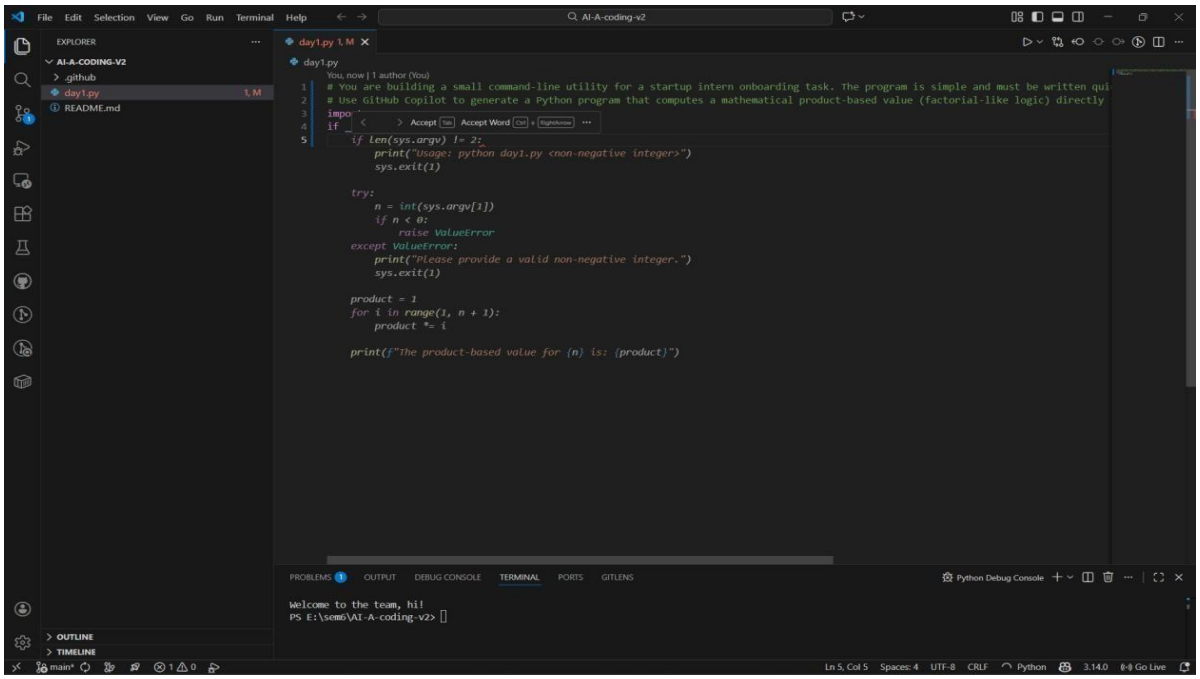
➢ **The prompt you typed ➢ Copilot's suggestions**

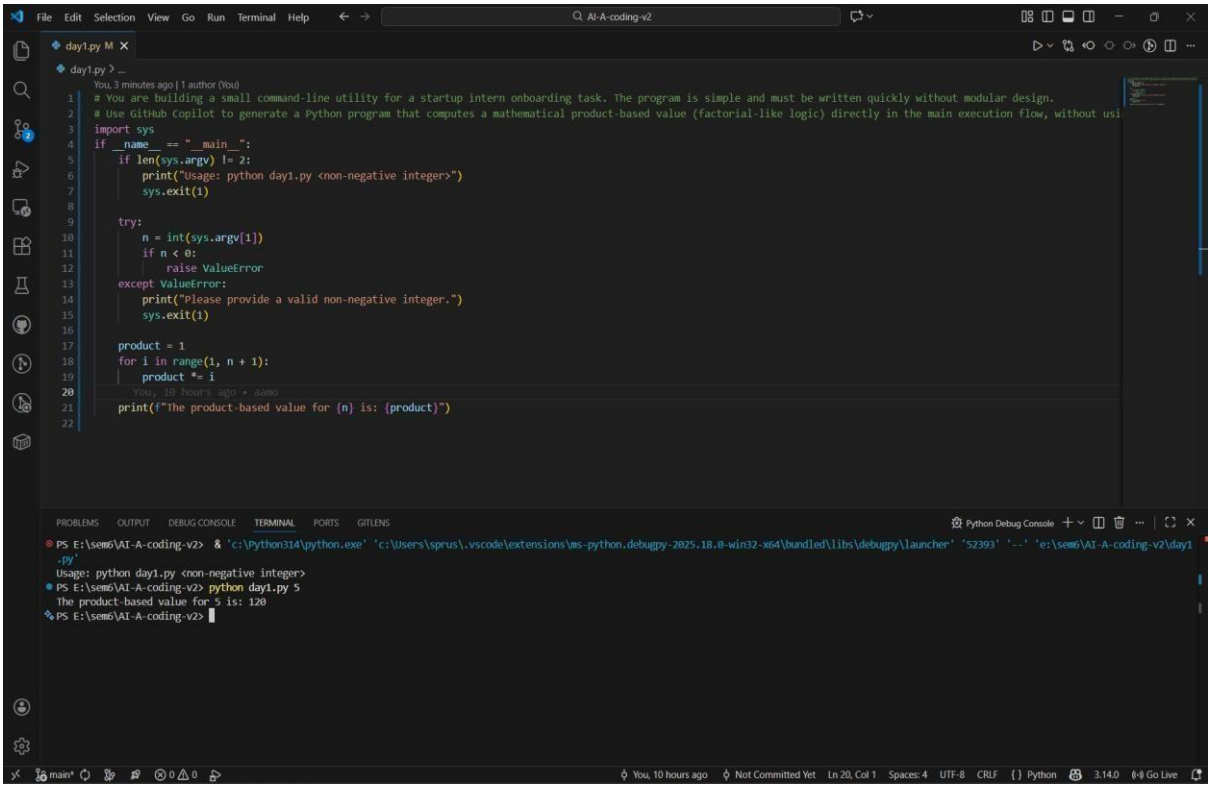
➢ **Sample input/output screenshots ➢ Brief reflection (5–6 lines):**

➢ **How helpful was Copilot for a beginner?**

➢ **Did it follow best practices automatically?**

Task 1: AI-Generated Logic Without Modularization (Factorial without Functions)





Task 2: AI Code Optimization & Cleanup (Improving Efficiency)

❖ Scenario

Your team lead asks you to review AI-generated code before committing it to a shared repository.

❖ Task Description

Analyze the code generated in Task 1 and use Copilot again to:

➢ Reduce unnecessary variables

➢ Improve loop clarity

➢ Enhance readability and efficiency Hint:

Prompt Copilot with phrases like "optimize this code", "simplify logic", or "make it more readable" ❖ Expected Deliverables

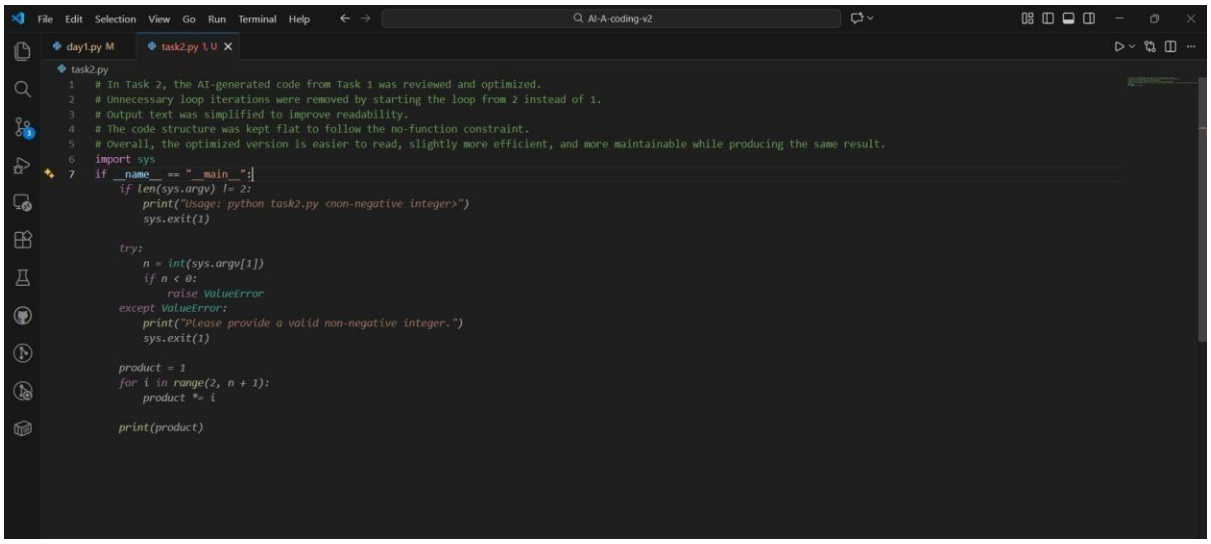
➢ Original AI-generated code

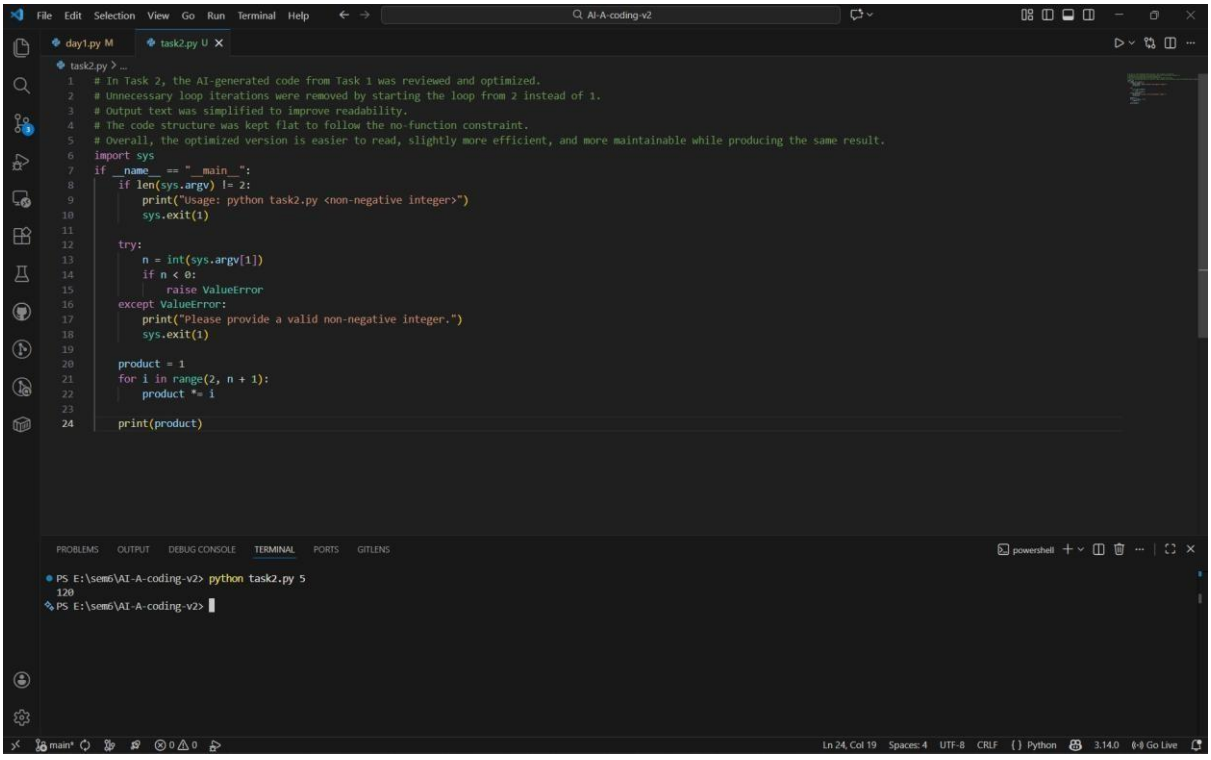
➢ Optimized version of the same code ➢ Side-by-side comparison ➢ Written explanation:

▪ What was improved?

▪ Why the new version is better (readability, performance, maintainability.

Task 2: AI Code Optimization & Cleanup (Improving Efficiency)





Task 3: Modular Design Using AI Assistance (Factorial with Functions) ❖ Scenario

The same logic now needs to be reused in multiple scripts.

❖ Task Description

Use GitHub Copilot to generate a modular version of the program by:

➢ Creating a user-defined function

➢ Calling the function from the main block

❖ Constraints

 # Task 3: Modular Design Using AI Assistance (Factorial with Functions)

➢ Use meaningful function and variable names

➢ Include inline comments (preferably suggested by Copilot)

❖ Expected Deliverables

➢ AI-assisted function-based program ➢

Screenshots showing: o Prompt

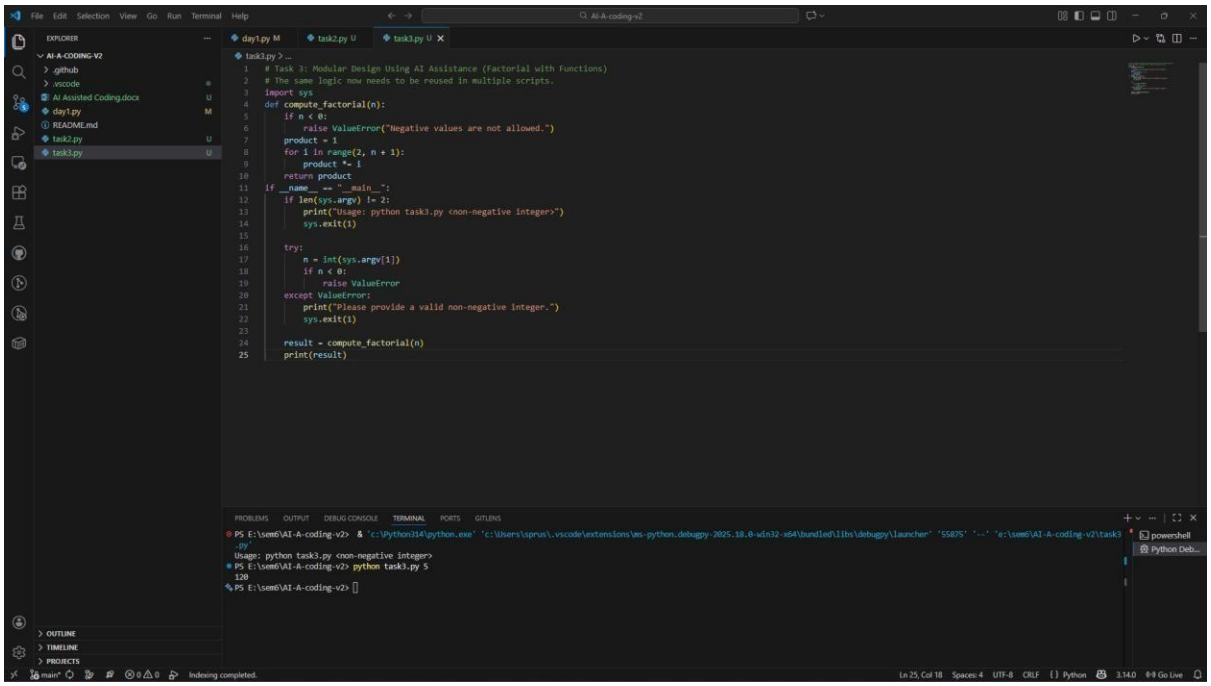
evolution o Copilot-generated function

logic

➢ Sample inputs/outputs

➢ Short note: o How modularity improves

reusability.



Short Note: How Modularity Improves Reusability

Modularity helps in reusability by helping separate logic in terms of different functions which may be reused in multiple programs. The factorial computation is put in a function which makes the code easier to maintain and test. If the logic has to be changed, changes can be made at

one place without having any impact on the whole program. Modular code is also more readable and easier to work on in a team environment.

Task 4: Comparative Analysis – Procedural vs Modular AI Code (With vs Without Functions)

❖ Scenario

As part of a code review meeting, you are asked to justify design choices.

❖ Task Description

Compare the non-function and function-based

Copilotgenerated programs on the following criteria:

- **Logic clarity**
- **Reusability**
- **Debugging ease**
- **Suitability for large projects**
- **AI dependency risk ❖ Expected Deliverables**

Choose one:

- **A comparison table**

OR

- **A short technical report (300–400 words).**

Task 4: Comparative Analysis – Procedural vs Modular AI Code (With vs Without Functions)

Task 5: AI-Generated Iterative vs Recursive Thinking

❖ Scenario

Your mentor wants to test how well AI

understands different computational paradigms.

Criteria	Procedural Code (Without Functions)	Modular Code (With Functions)
Logic Clarity	Logic is written in one continuous flow, which is easy to follow for very small programs but becomes cluttered as code grows.	Logic is clearly separated into functions, making the purpose of each part easier to understand.
Reusability	Code cannot be reused easily because the logic is tightly coupled to the main execution block.	Function-based logic can be reused across multiple scripts by importing or calling the function.
Debugging Ease	Debugging is harder since all logic exists in one block, making it difficult to isolate issues.	Debugging is easier because errors can be traced to specific functions.
Suitability for Large Projects	Not suitable for large projects as it leads to poor organization and low maintainability.	Well suited for large projects due to better structure, scalability, and teamwork support.
AI Dependency Risk	High risk, as beginners may copy AIgenerated code without understanding the full flow.	Lower risk, as modular structure encourages understanding of individual components.

❖ Task Description

Prompt Copilot to generate:

An iterative version of the logic

A recursive version of the same logic

❖ Constraints

Both implementations must produce identical outputs

Students must not manually write the code first

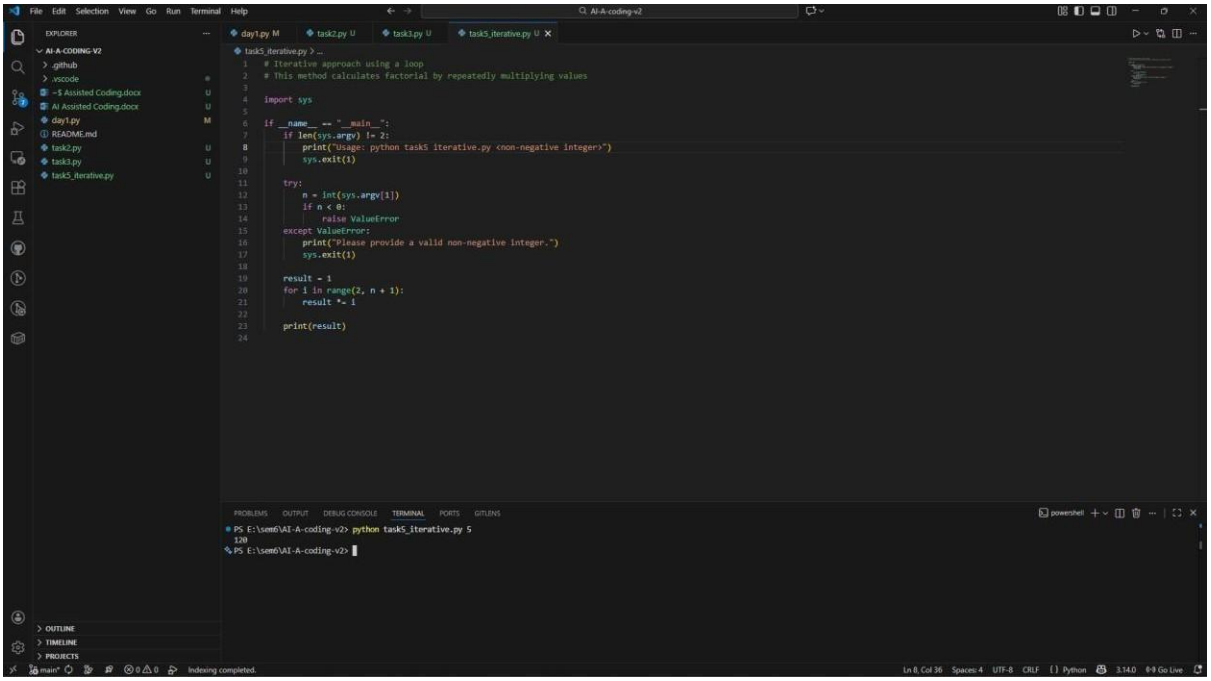
❖ Expected Deliverables

Two AI-generated implementations

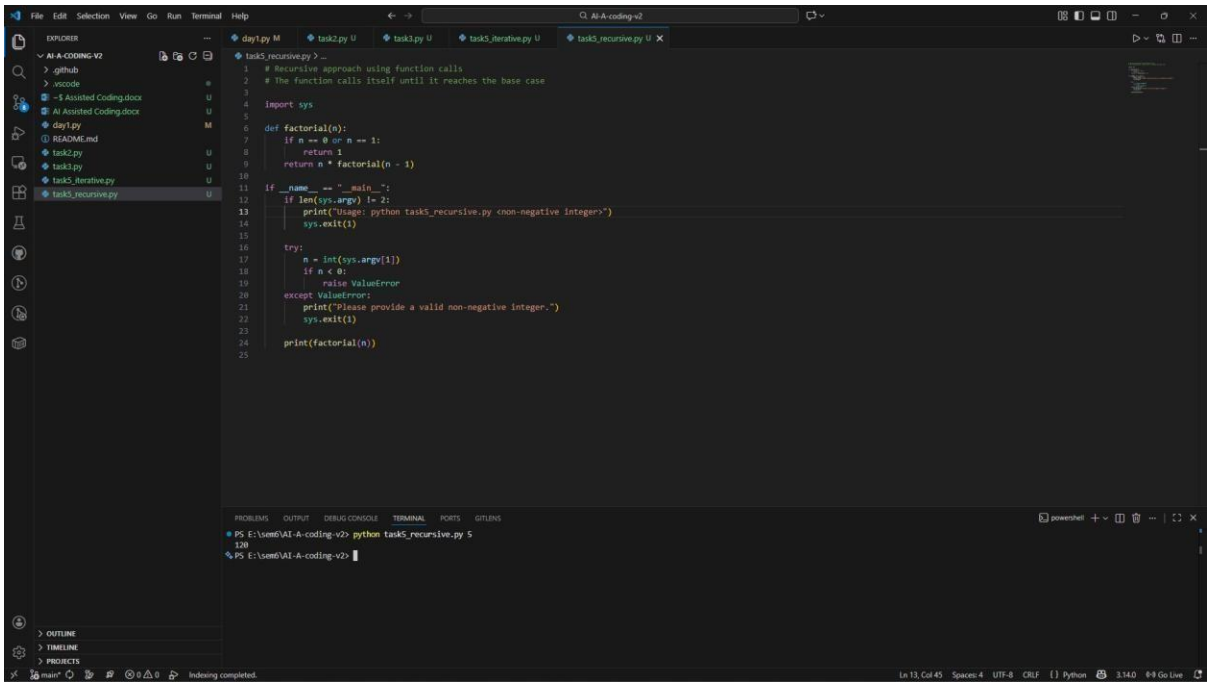
Execution flow explanation (in your own words)
Comparison covering:
➢ **Readability**
➢ **Stack usage**
➢ **Performance implications**
➢ **When recursion is not recommended.**

Task 5: AI-Generated Iterative vs Recursive Thinking

Iterative Thinking –



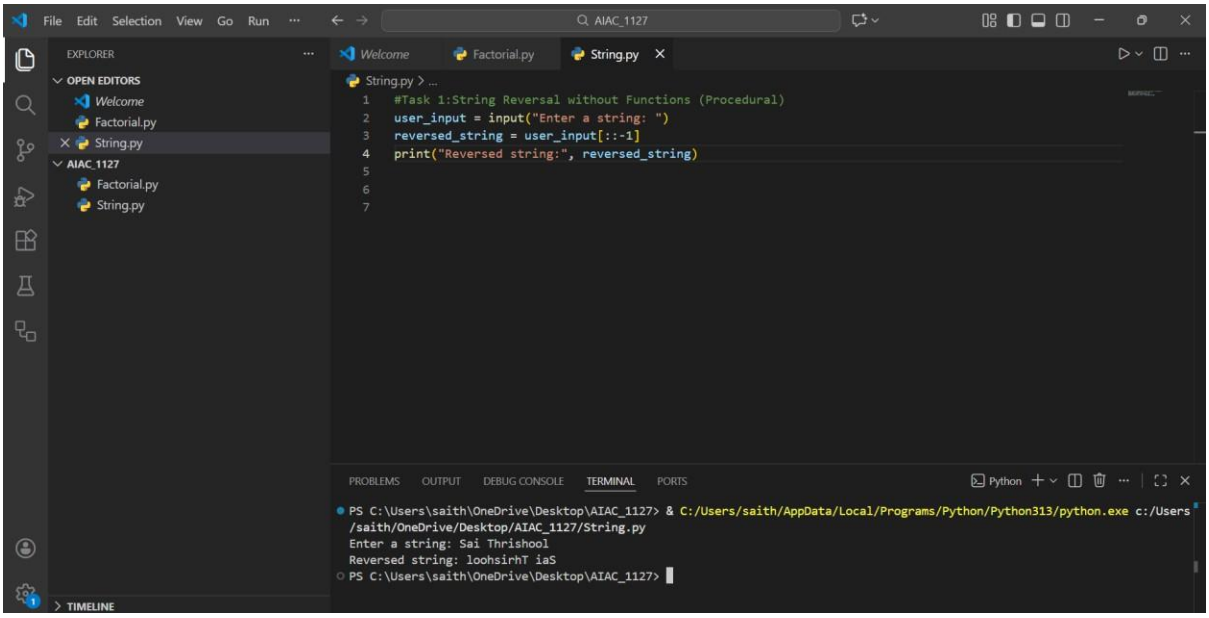
Recursive thinking –



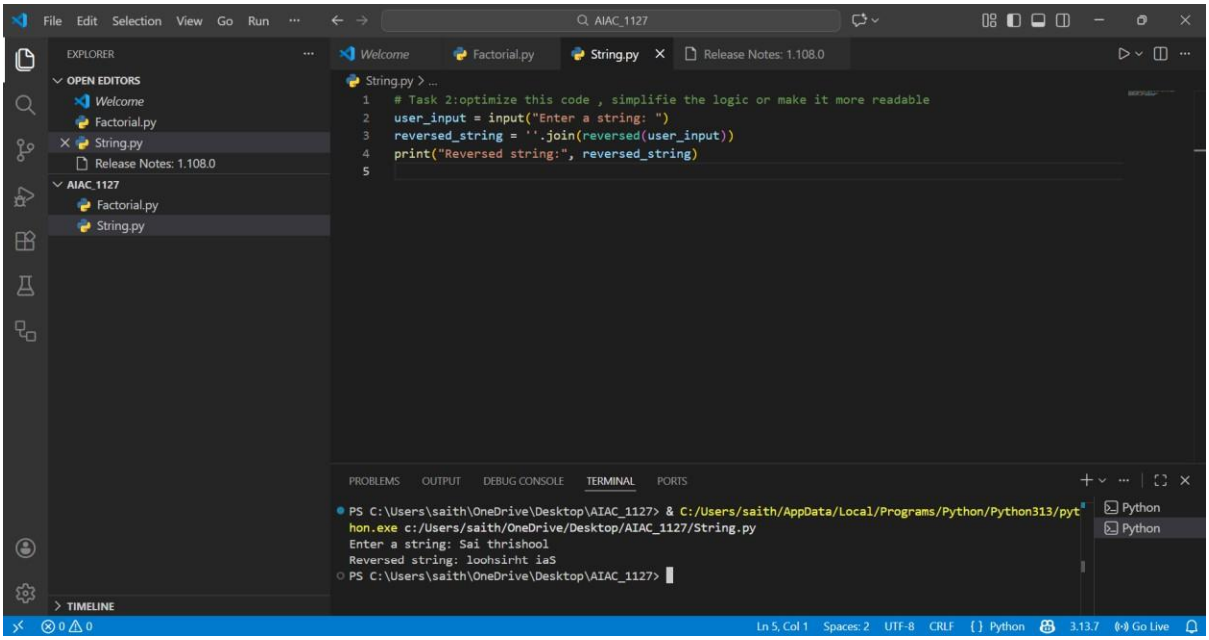
Aspect	Iterative Approach	Recursive Approach
Readability	Easy to understand for beginners	More mathematical and elegant
Stack Usage	Uses constant memory	Uses additional stack memory
Performance	Faster and memory efficient	Slower for large inputs
Error Risk	Low	Risk of stack overflow
When Not Recommended	—	Not recommended for large input values

ASSIGNMENT – 1.5

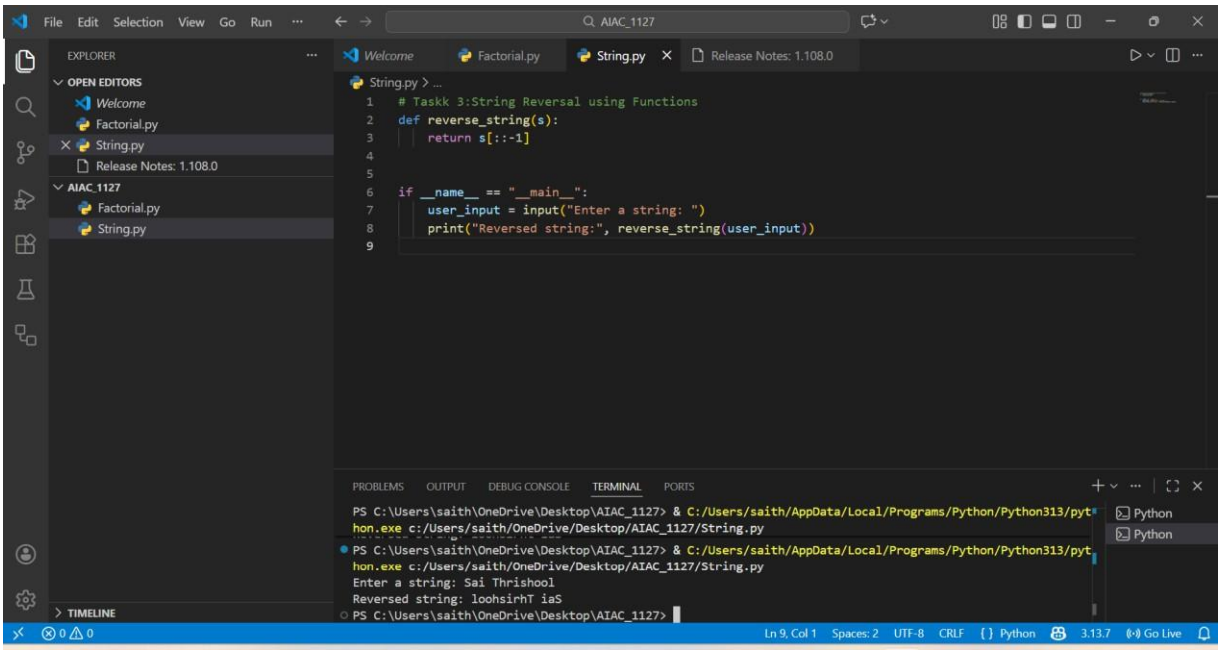
TASK 1: String Reversal without Functions (Procedural)



TASK 2: Optimize this code , simplify the logic or make it more readable.



TASK 3: String Reversal using Functions.



TASK 4: Comparative Analysis – Procedural VS Modular Approach.

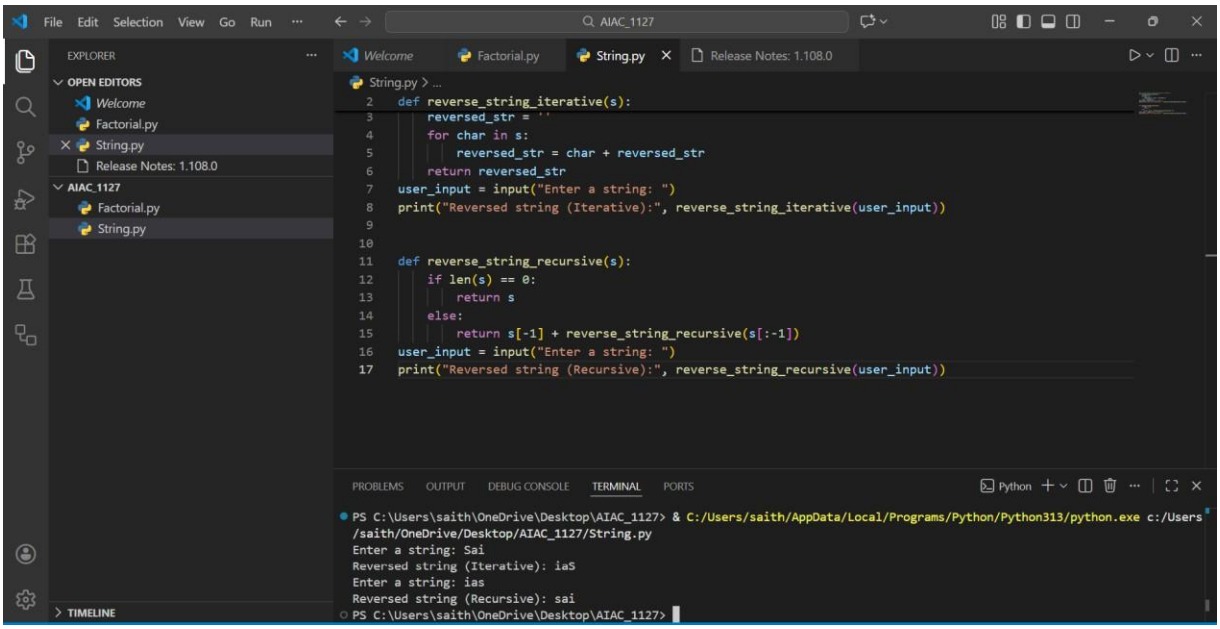
Procedural Approach (Without Functions):

The string reversal logic is implemented directly in the main code. While this approach is simple and easy to understand for small programs, it lacks reusability and scalability. Debugging becomes difficult as the program grows because all logic is tightly coupled.

Modular Approach (With Functions):

The function-based implementation separates logic from execution, improving code readability and structure. The function can be reused in multiple parts of an application, making it suitable for large-scale systems. Debugging and maintenance are easier due to isolated logic.

TASK 5: Iterative vs Recursive Fibonacci Approach.


File Edit Selection View Go Run
AIAC_1127
EXPLORER
OPEN EDITORS
Welcome
Factorial.py
String.py
Release Notes: 1.108.0
AIAC_1127
Factorial.py
String.py
TIMELINE
Welcome
Factorial.py
String.py
Release Notes: 1.108.0
String.py > ...
def reverse_string_iterative(s):
reversed_str = ''
for char in s:
reversed_str = char + reversed_str
return reversed_str
user_input = input("Enter a string: ")
print("Reversed string (Iterative):", reverse_string_iterative(user_input))
def reverse_string_recursive(s):
if len(s) == 0:
return s
else:
return s[-1] + reverse_string_recursive(s[:-1])
user_input = input("Enter a string: ")
print("Reversed string (Recursive):", reverse_string_recursive(user_input))
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
PS C:\Users\saith\OneDrive\Desktop\AIAC_1127> & C:/Users/saith/AppData/Local/Programs/Python/Python313/python.exe c:/Users/saith/OneDrive/Desktop/AIAC_1127/String.py
Enter a string: Sai
Reversed string (Iterative): iaS
Enter a string: ias
Reversed string (Recursive): sai
PS C:\Users\saith\OneDrive\Desktop\AIAC_1127>

THANK YOU!!