AI Assisted Coding

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batch 04

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07-01-2026

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.

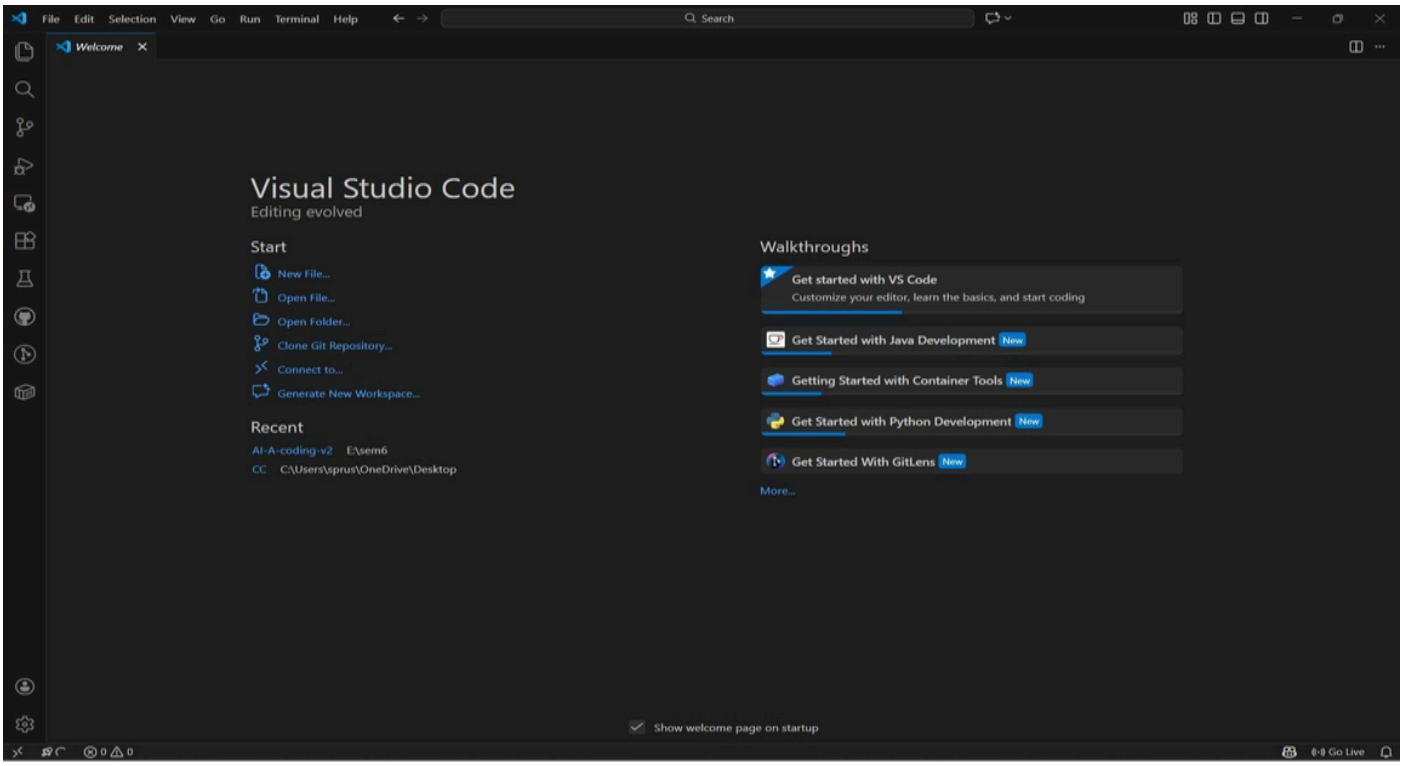
Task 0

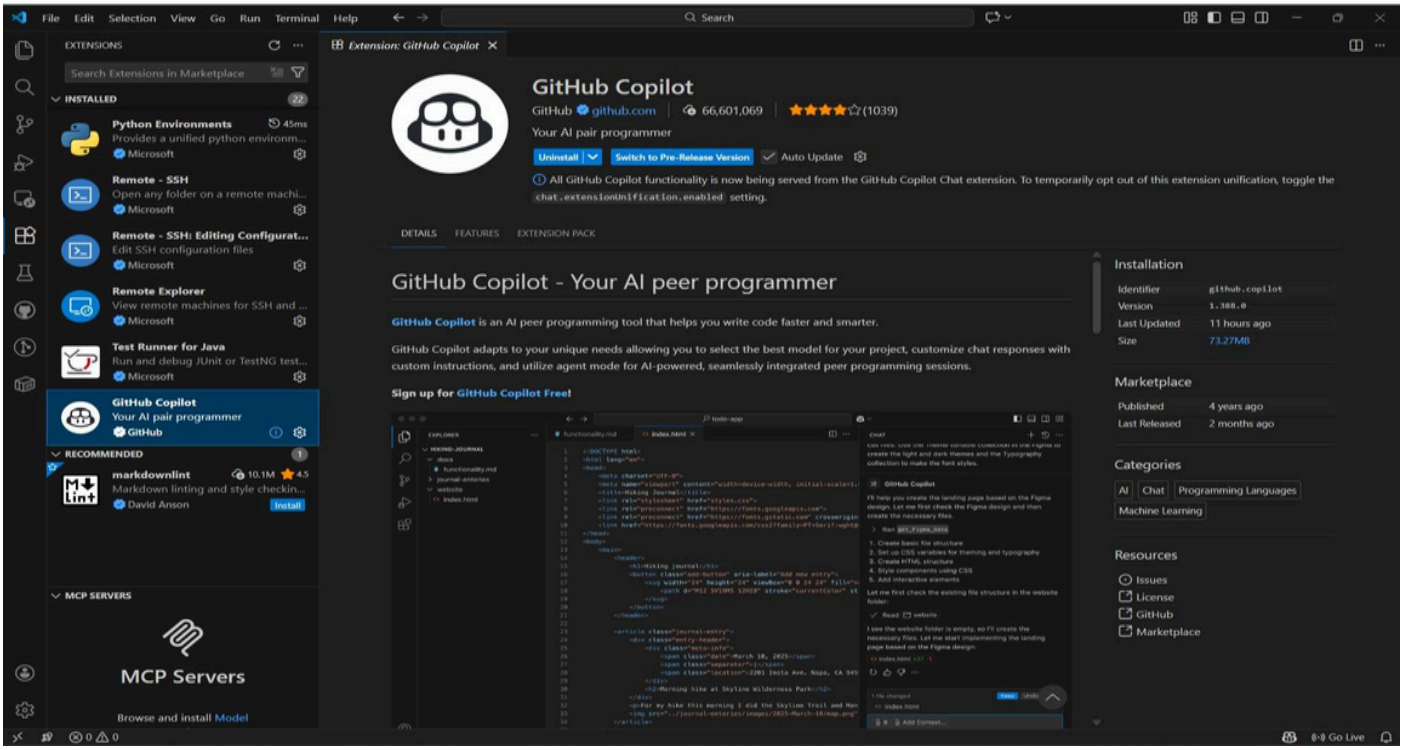
- Install and configure GitHub Copilot in VS Code. Take screenshots of each step.

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 (factorial-like 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

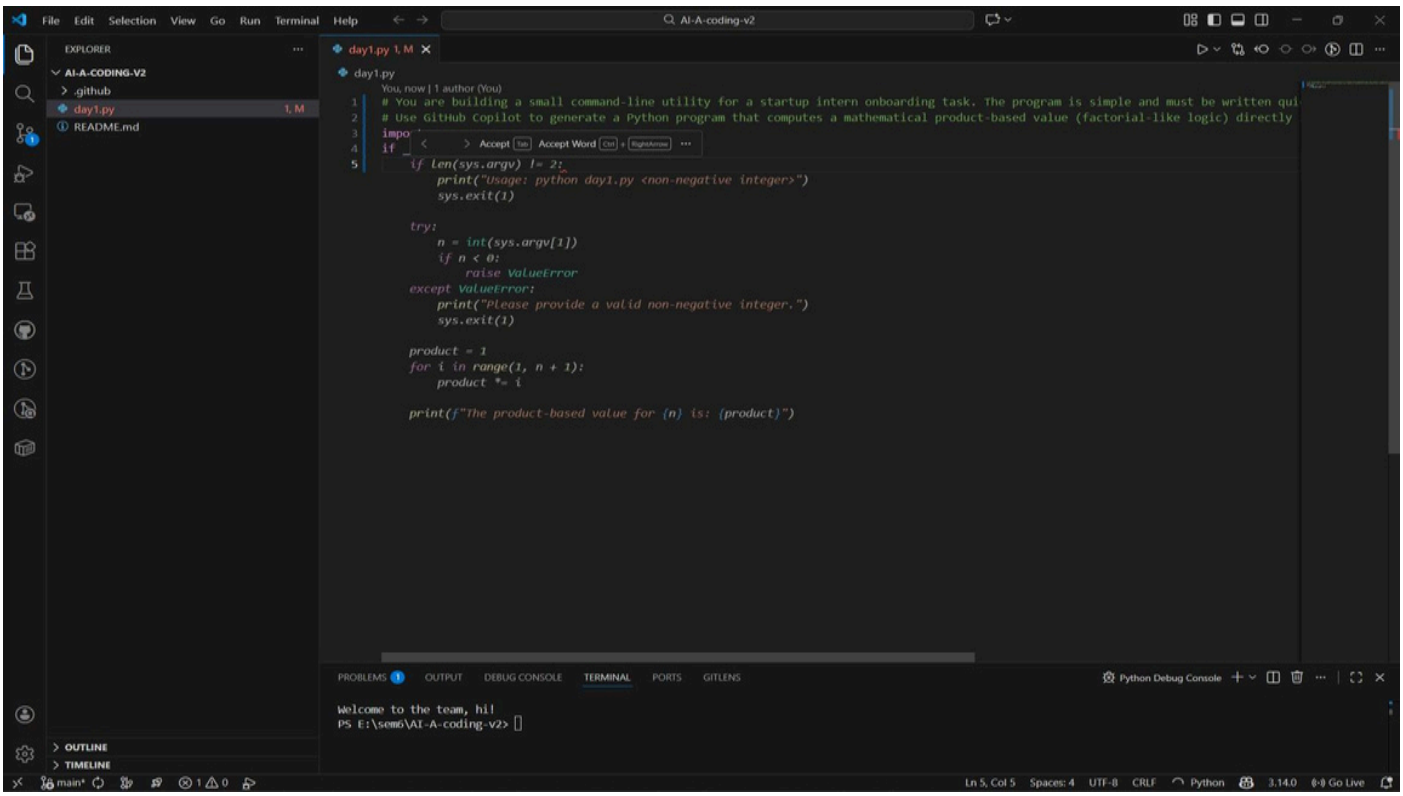
➢ Sample input/output screenshots

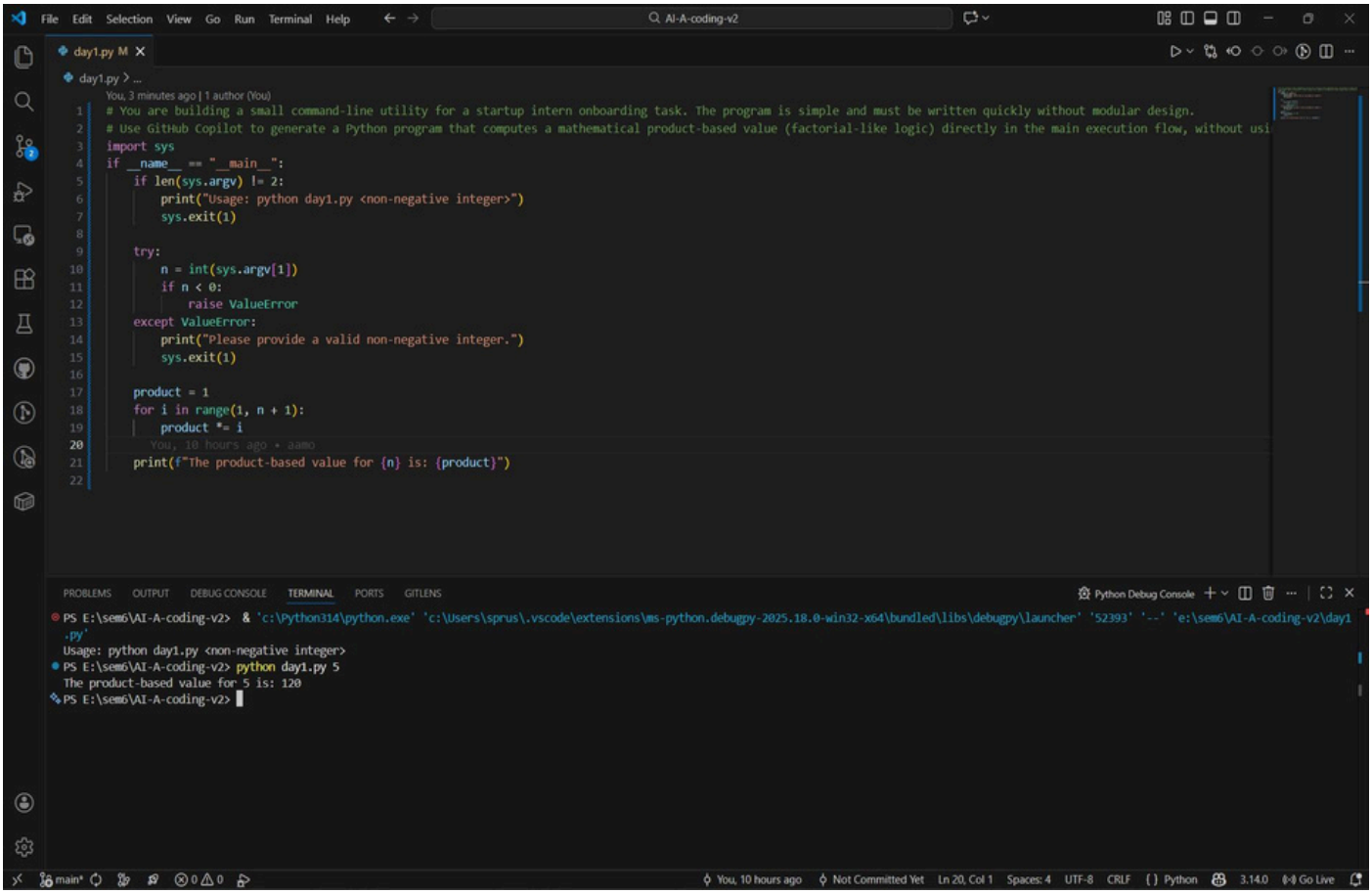
➢ Brief reflection (5–6 lines):

➢ 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 C 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

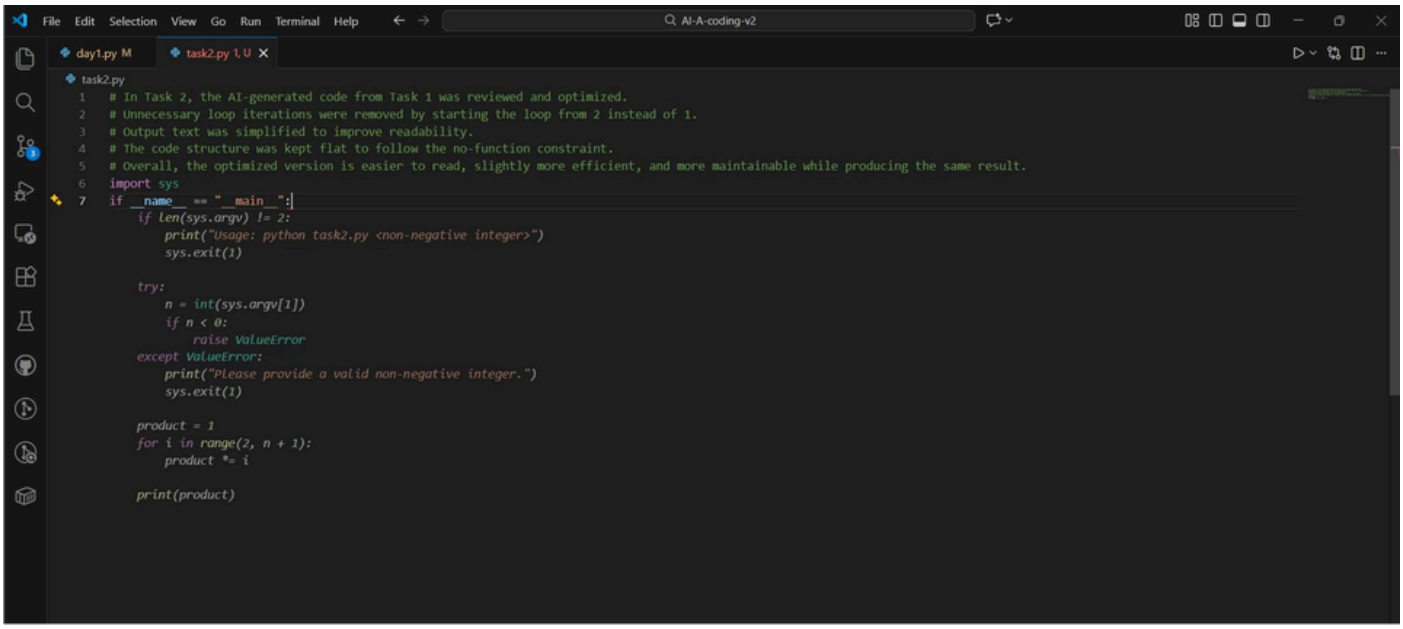
➢ Written explanation:

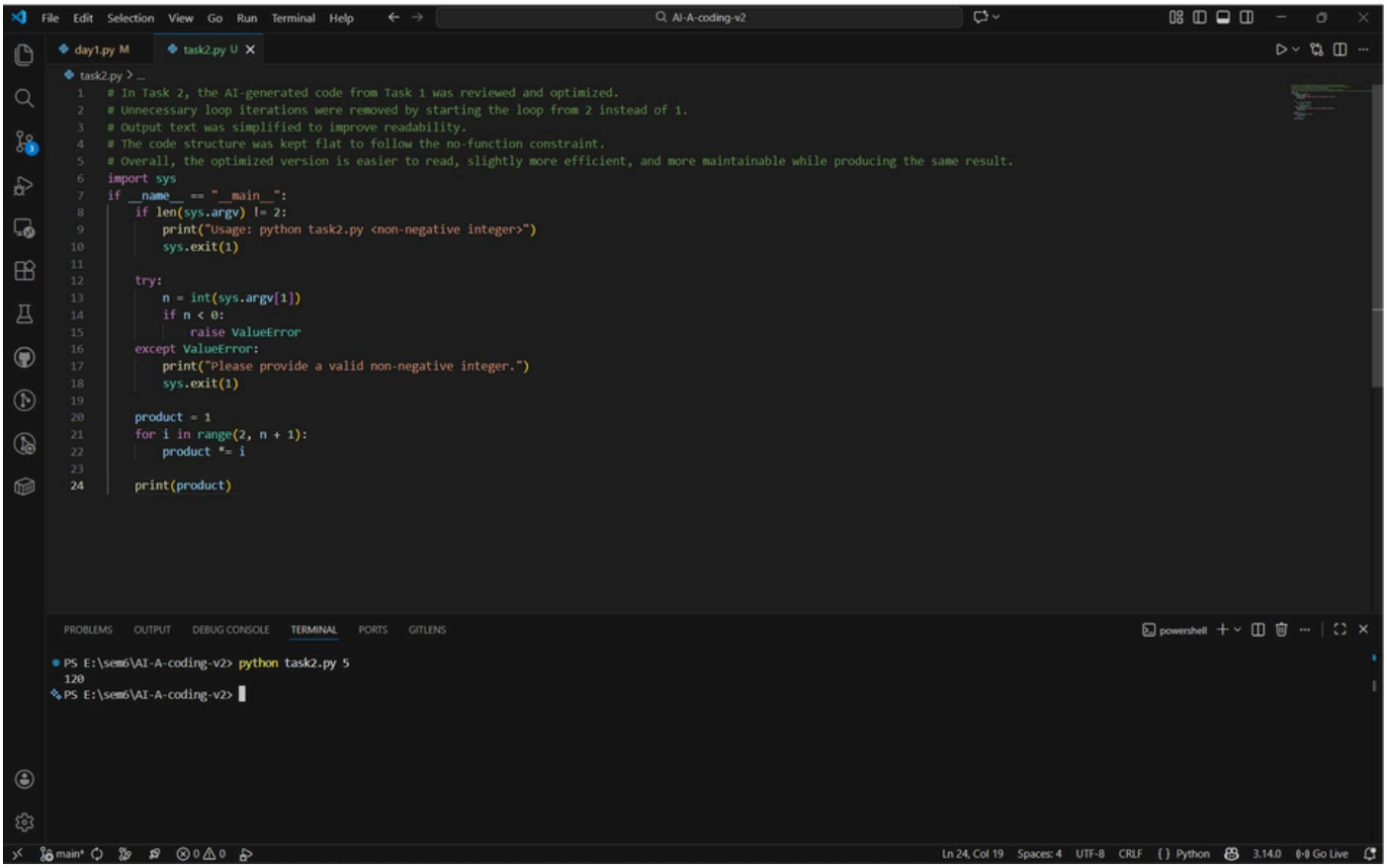
▪ What was improved?

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

maintainability.

Task 2: AI Code Optimization C 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:

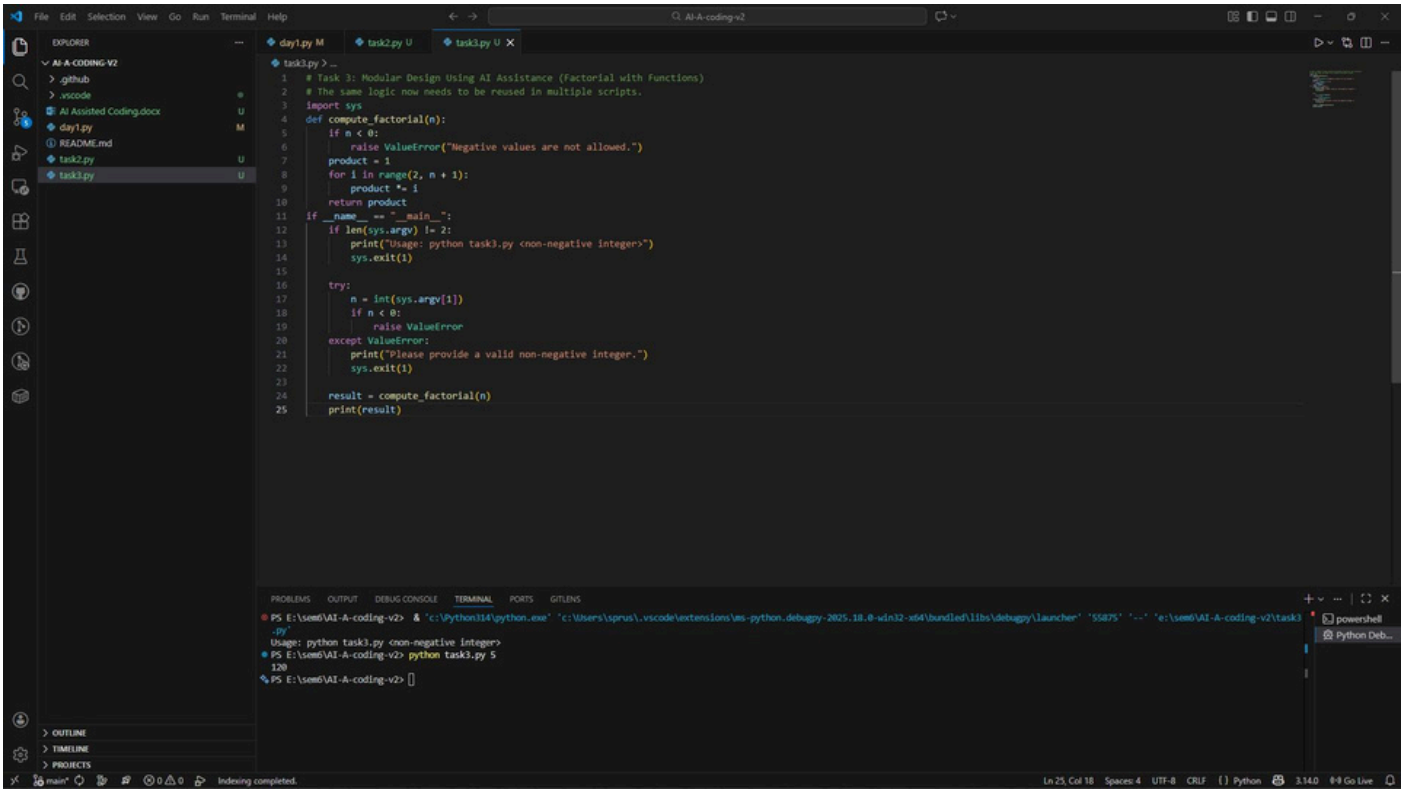
o Prompt evolution

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 ateam 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 Copilot-generated 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)

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 hard to understand 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 because 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 structure, scalability, and maintainability.	Well suited for large projects due to better organization, reusability, and teamwork support.
AI Dependency Risk	High risk, as beginners may copy AI-generated code without understanding the full flow.	Lower risk, as modular structure encourages understanding of individual components.

Task 5: AI-Generated Iterative vs Recursive Thinking

❖ Scenario

Your mentor wants to test how well AI understands different computational paradigms.

❖ 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

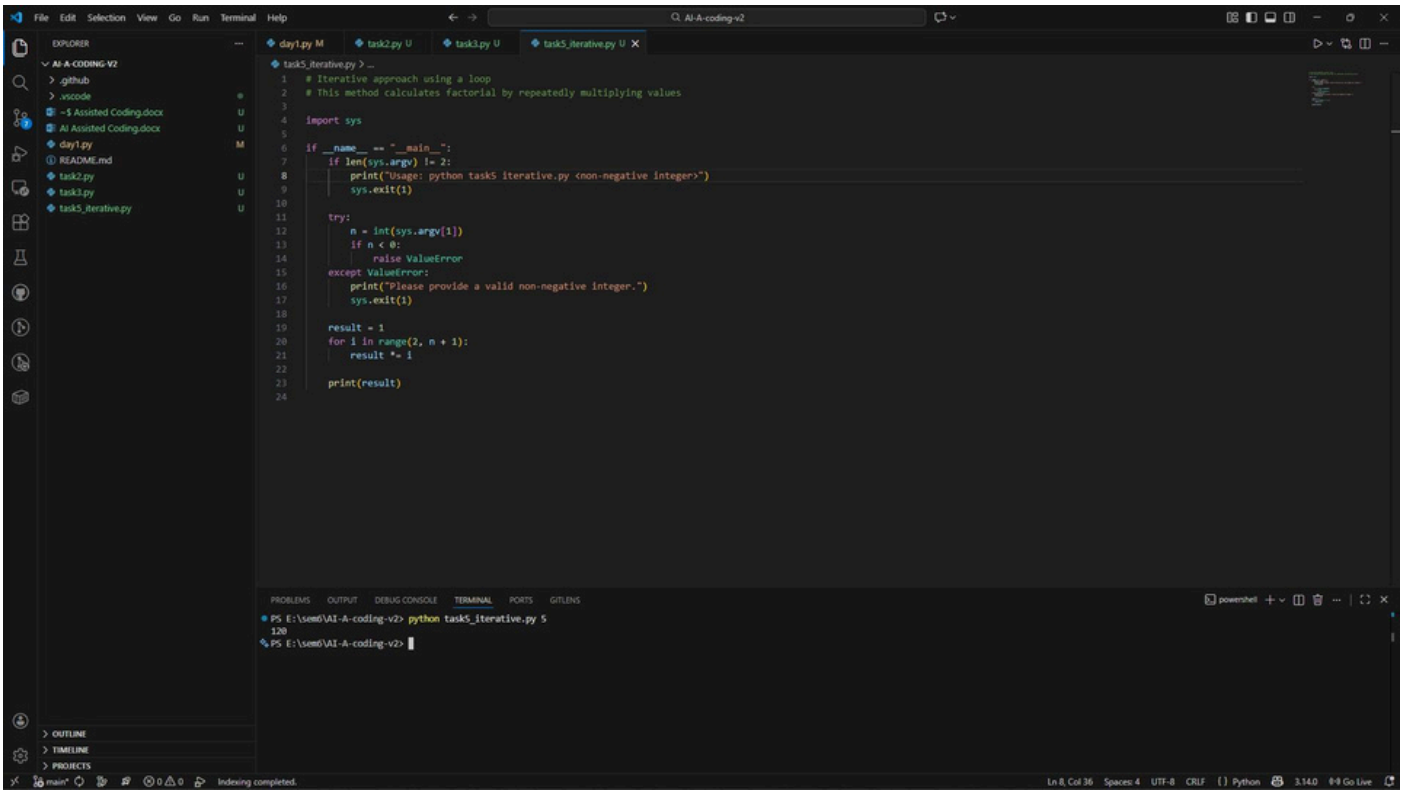
➢ Stack usage

➢ Performance implications

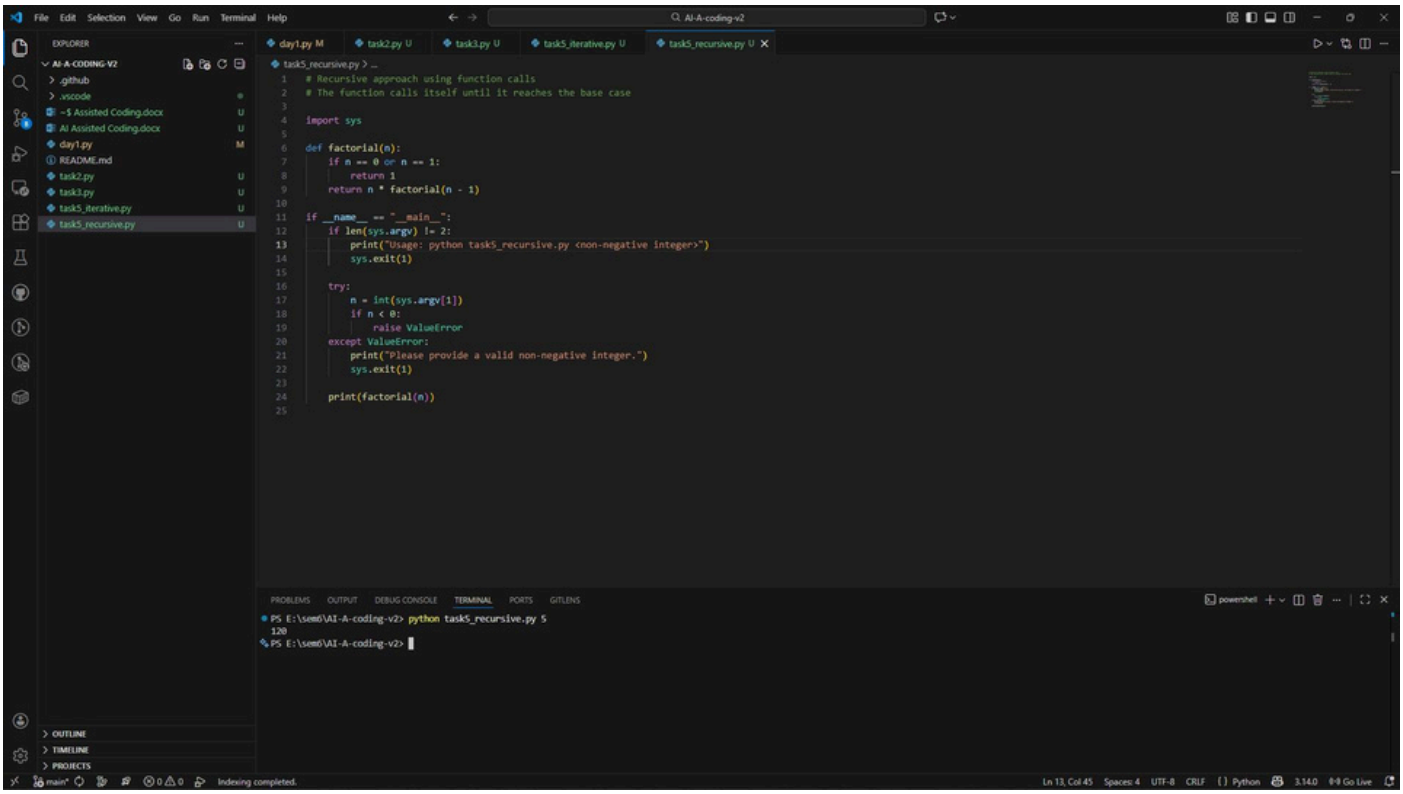
➢ When recursion is not recommended.

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

AI Assisted Coding

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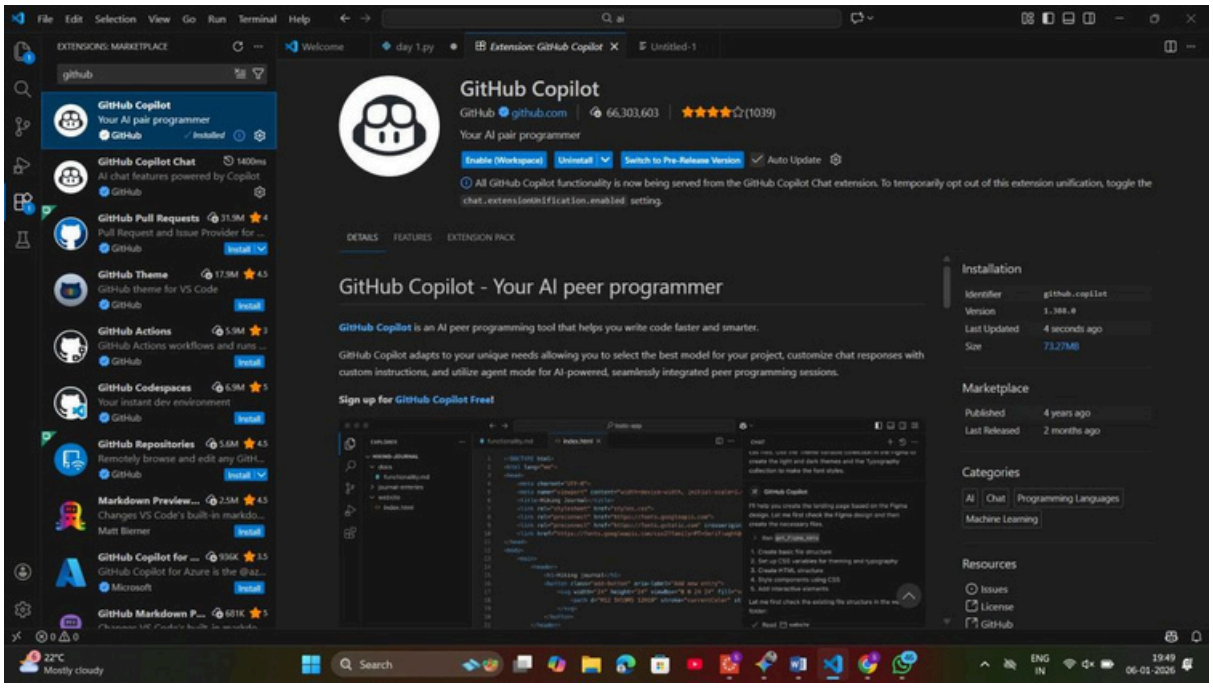
Task 0: Environment Setup:-

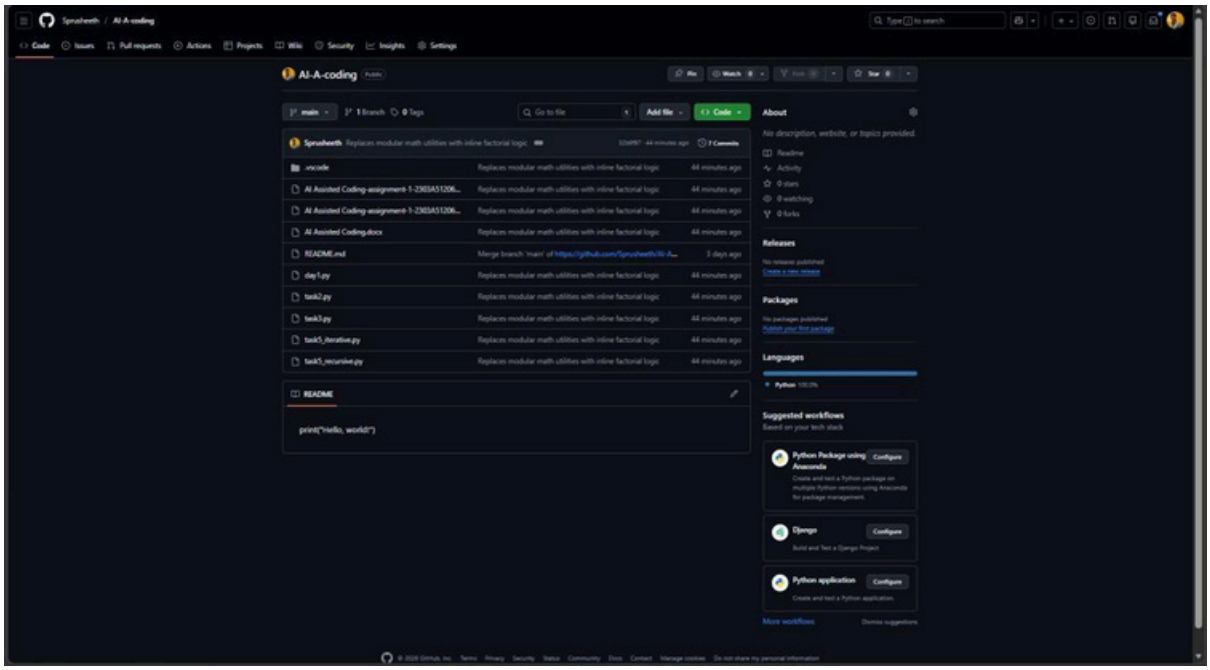
Task 0

● 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 1: Non-Modular Logic (Factorial):-

: AI-Generated Logic Without Modularization (String Reversal Without Functions)

❖ Scenario

You are developing a basic text-processing utility for a messaging application.

❖ Task Description

Use GitHub Copilot to generate a Python program that:

➢ Reverses a given string

➢ Accepts user input

➢ Implements the logic directly in the main code

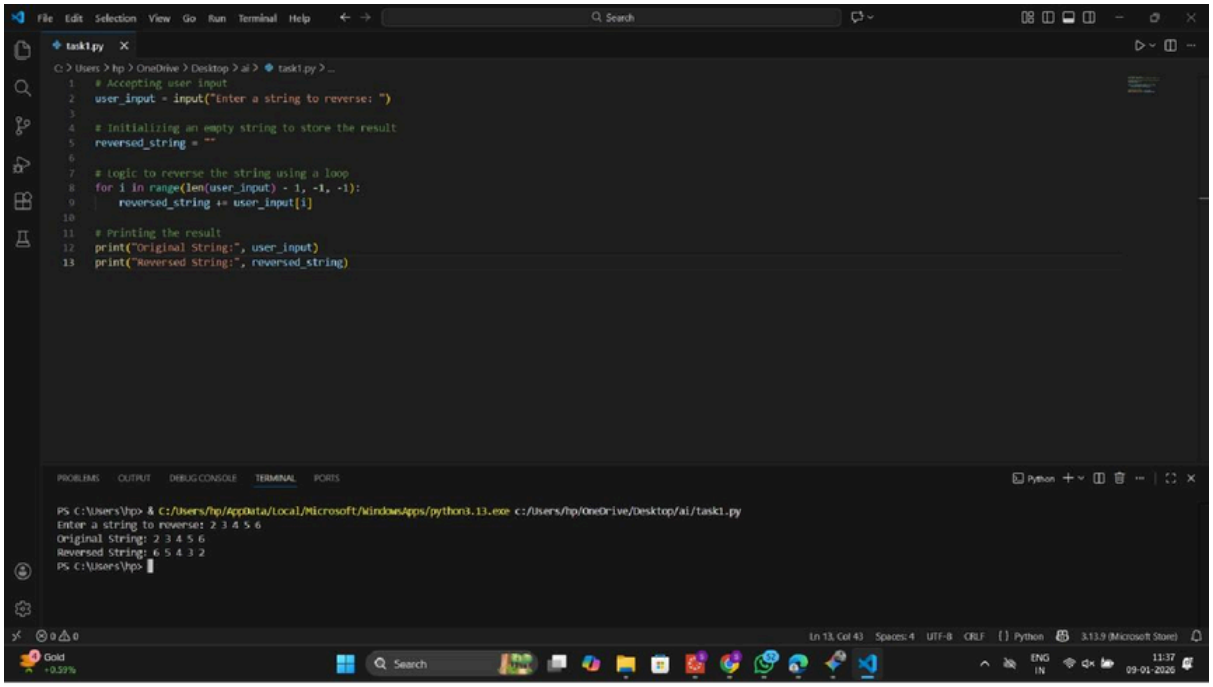
➢ Does not use any user-defined functions

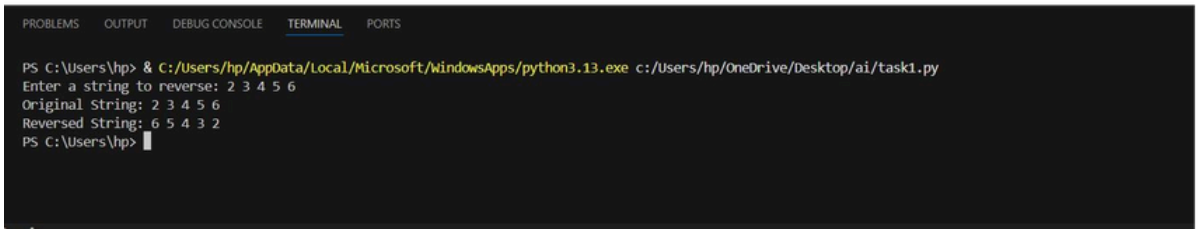
❖ Expected Output

➢ Correct reversed string

➢ Screenshots showing Copilot-generated code suggestions

➢ Sample inputs and outputs





Task 2: AI Code Optimization:- Efficiency s Logic Optimization (Readability Improvement)

❖ Scenario

The code will be reviewed by other developers.

❖ Task Description

Examine the Copilot-generated code from Task 1 and improve it by:

➢ Removing unnecessary variables

➢ Simplifying loop or indexing logic

➢ Improving readability

➢ Use Copilot prompts like:

▪ "Simplify this string reversal code"

▪ "Improve readability and efficiency"

Hint:

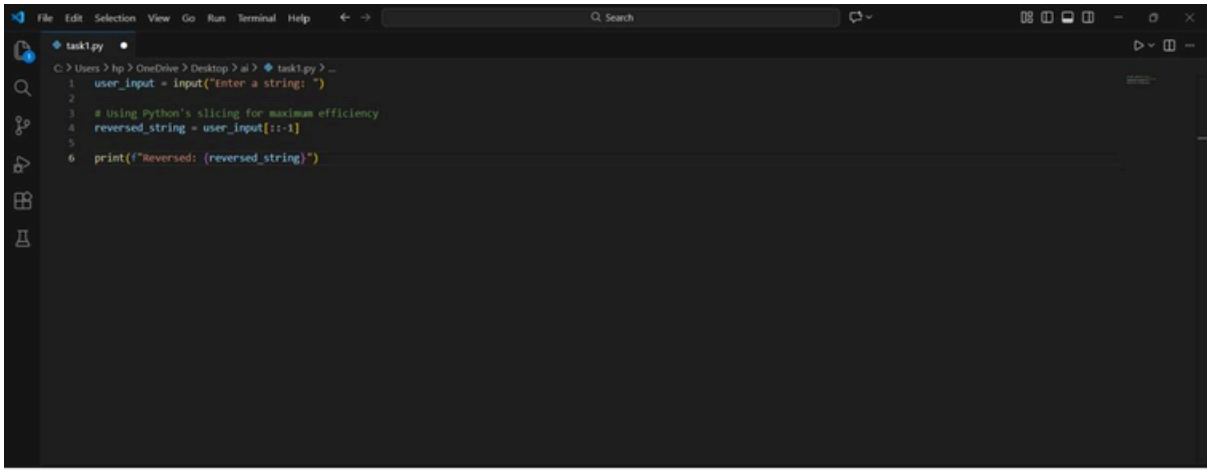
Prompt Copilot with phrases like

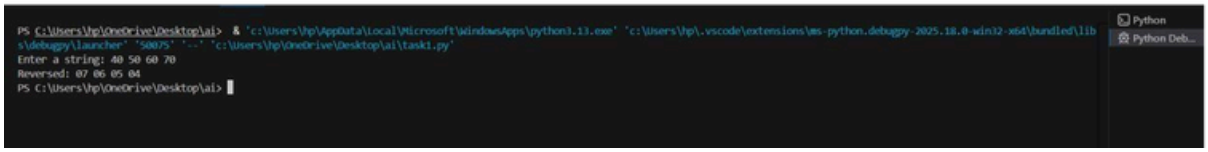
“optimize this code”, “simplify logic”, or “make it more readable”

❖ Expected Output

➢ Original and optimized code versions

➢ Explanation of how the improvements reduce time complexity





Task 3: Modular Design Using AI Assistance (String Reversal Using Functions)

❖ Scenario

The string reversal logic is needed in multiple parts of an application.

❖ Task Description

Use GitHub Copilot to generate a function-based Python program that:

➢ Uses a user-defined function to reverse a string

➢ Returns the reversed string

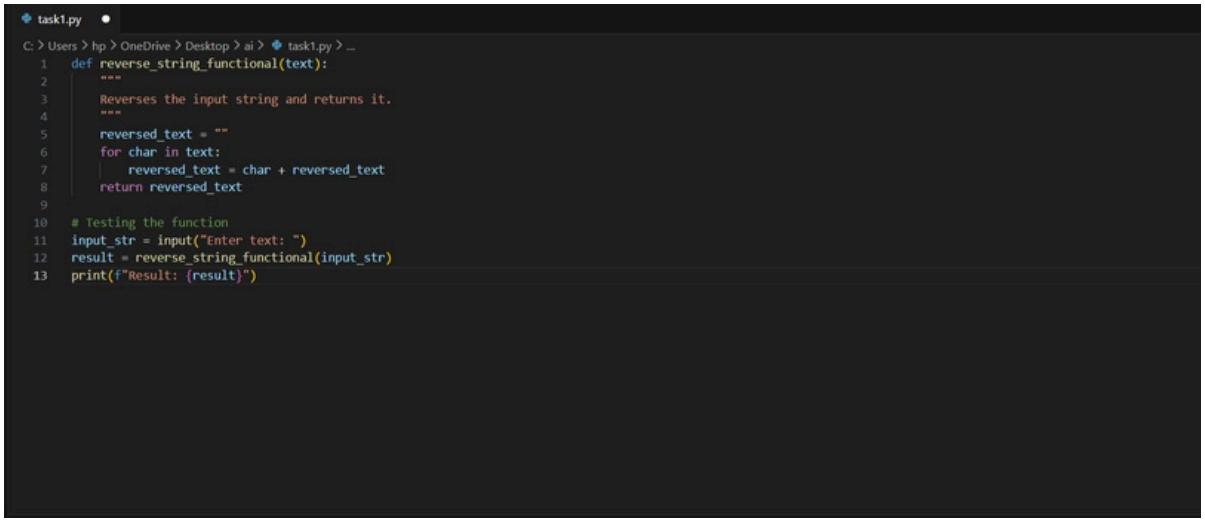
➢ Includes meaningful comments (AI-assisted)

❖ Expected Output

➢ Correct function-based implementation

➢ Screenshots documenting Copilot’s function generation

➢ Sample test cases and outputs



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

❖ Scenario

You are asked to justify design choices during a code review.

❖ Task Description

Compare the Copilot-generated programs:

➢ Without functions (Task 1)

➢ With functions (Task 3) Analyze them based on:

➢ Code clarity

➢ Reusability

➢ Debugging ease

➢ Suitability for large-scale applications

❖ Expected Output

Comparison table or short analytical report

Feature	Procedural (Without Functions)	Modular (With Functions)
Code Clarity	Easy for tiny scripts; messy for large ones.	Very high; logic is isolated and named.
Reusability	Must copy-paste code to use it again.	Can be called anywhere in the app.
Debugging	Harder to isolate where an error occurs.	Easy to unit test the specific function.
Scalability	Not suitable for large applications.	Essential for professional development.

Task 5: AI-Generated Iterative vs Recursive Fibonacci Approaches (Different Algorithmic Approaches to String Reversal)

❖ Scenario

Your mentor wants to evaluate how AI handles alternative logic paths.

❖ Task Description

Prompt GitHub Copilot to generate:

➢ A loop-based string reversal approach

➢ A built-in / slicing-based string reversal approach

❖ Expected Output

➢ Two correct implementations

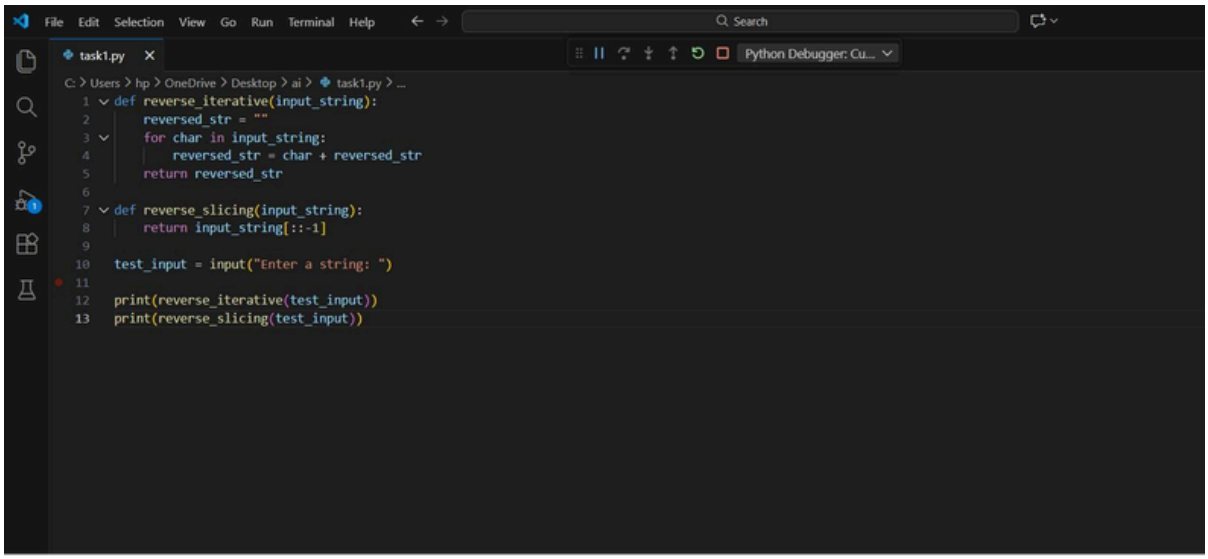
➢ Comparison discussing:

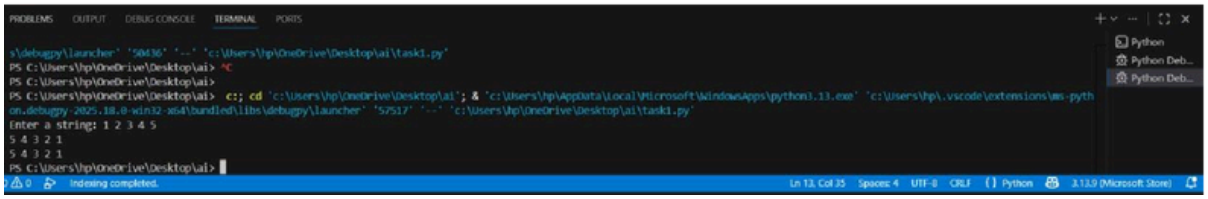
▪ Execution flow

▪ Time complexity

▪ Performance for large inputs

▪ When each approach is appropriate.


File Edit Selection View Go Run Terminal Help
Search
task1.py
Python Debugger: Cu...
C: > Users > hp > OneDrive > Desktop > ai > task1.py > ...
def reverse_iterative(input_string):
reversed_str = ""
for char in input_string:
reversed_str = char + reversed_str
return reversed_str
def reverse_slicing(input_string):
return input_string[::-1]
test_input = input("Enter a string: ")
print(reverse_iterative(test_input))
print(reverse_slicing(test_input))


PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
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PS C:\Users\hp\OneDrive\Desktop\ai>
PS C:\Users\hp\OneDrive\Desktop\ai> c:; cd 'c:\Users\hp\OneDrive\Desktop\ai'; & 'c:\Users\hp\AppData\Local\Microsoft\WindowsApps\python3.13.exe' 'c:\Users\hp\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '57517' '--' 'c:\Users\hp\OneDrive\Desktop\ai\task1.py'
Enter a string: 1 2 3 4 5
5 4 3 2 1
5 4 3 2 1
PS C:\Users\hp\OneDrive\Desktop\ai>
Python
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Python Deb...
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