ASSIGNMENT – 9.2

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BATCH: AIB03

Task-1: (Documentation – Google-Style Docstrings for Python Functions)

• Task: Use AI to add Google-style docstrings to all functions in a given Python script.

• Instructions:

o Prompt AI to generate docstrings without providing any input-output examples.

o Ensure each docstring includes:

▪ Function description

▪ Parameters with type hints

▪ Return values with type hints

▪ Example usage

o Review the generated docstrings for accuracy and formatting.

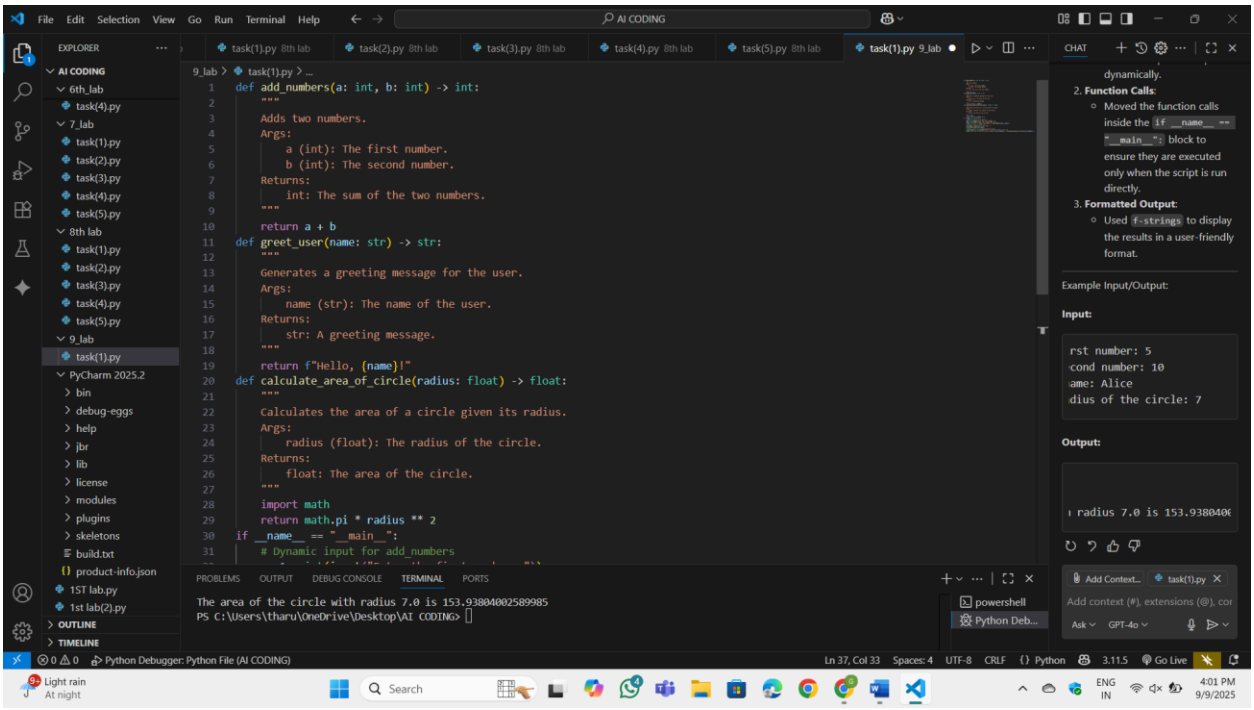
• Expected Output #1:

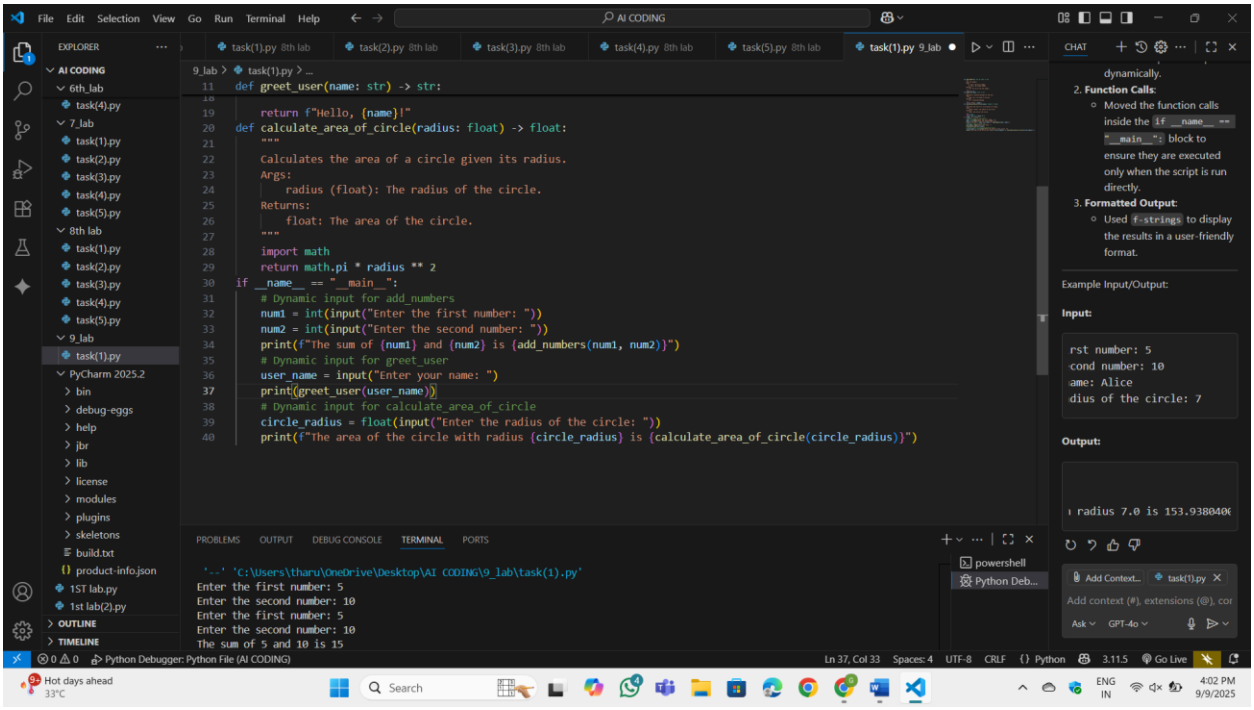
o A Python script with all functions documented using correctly formatted Google-style docstrings

Prompt: add Google-style docstrings to all functions in a given Python script.

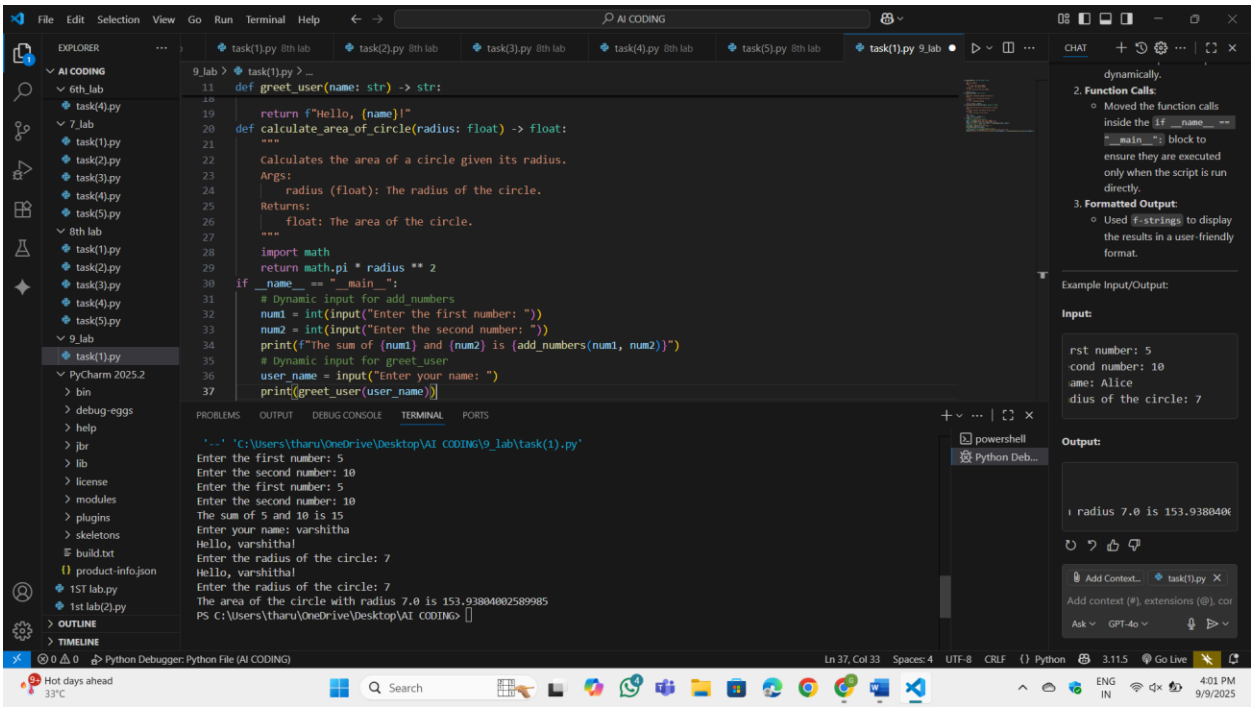
Ensure each docstring includes: Function description, Parameters with type hints, Return values with type hints

Code:


def add_numbers(a: int, b: int) -> int:
"""
Adds two numbers.
Args:
a (int): The first number.
b (int): The second number.
Returns:
int: The sum of the two numbers.
"""
return a + b
def greet_user(name: str) -> str:
"""
Generates a greeting message for the user.
Args:
name (str): The name of the user.
Returns:
str: A greeting message.
"""
return f"Hello, {name}!"
def calculate_area_of_circle(radius: float) -> float:
"""
Calculates the area of a circle given its radius.
Args:
radius (float): The radius of the circle.
Returns:
float: The area of the circle.
"""
import math
return math.pi * radius ** 2
if __name__ == "__main__":
# Dynamic input for add_numbers
The area of the circle with radius 7.0 is 153.93804002589985
PS C:\Users\tharu\OneDrive\Desktop\AI CODING>


def greet_user(name: str) -> str:
def calculate_area_of_circle(radius: float) -> float:
"""
Calculates the area of a circle given its radius.
Args:
radius (float): The radius of the circle.
Returns:
float: The area of the circle.
"""
import math
return math.pi * radius ** 2
if __name__ == "__main__":
# Dynamic input for add_numbers
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))
print(f"The sum of {num1} and {num2} is {add_numbers(num1, num2)}")
# Dynamic input for greet_user
user_name = input("Enter your name: ")
print(greet_user(user_name))
# Dynamic input for calculate_area_of_circle
circle_radius = float(input("Enter the radius of the circle: "))
print(f"The area of the circle with radius {circle_radius} is {calculate_area_of_circle(circle_radius)}")
'--' 'C:\Users\tharu\OneDrive\Desktop\AI CODING\9_lab\task(1).py'
Enter the first number: 5
Enter the second number: 10
Enter the first number: 5
Enter the second number: 10
The sum of 5 and 10 is 15

OP:



Observation:

Added input() prompts for each function to allow the user to provide input dynamically. Moved the function calls inside the if __name__ == "__main__": block to ensure they are executed only when the script is run directly. Used f-strings to display the results in a user-friendly format.

Task-2: (Documentation – Inline Comments for Complex Logic)

• Task: Use AI to add meaningful inline comments to a Python program explaining only complex logic parts.

• Instructions:

o Provide a Python script without comments to the AI.

o Instruct AI to skip obvious syntax explanations and focus only on tricky or non-intuitive code sections.

o Verify that comments improve code readability and

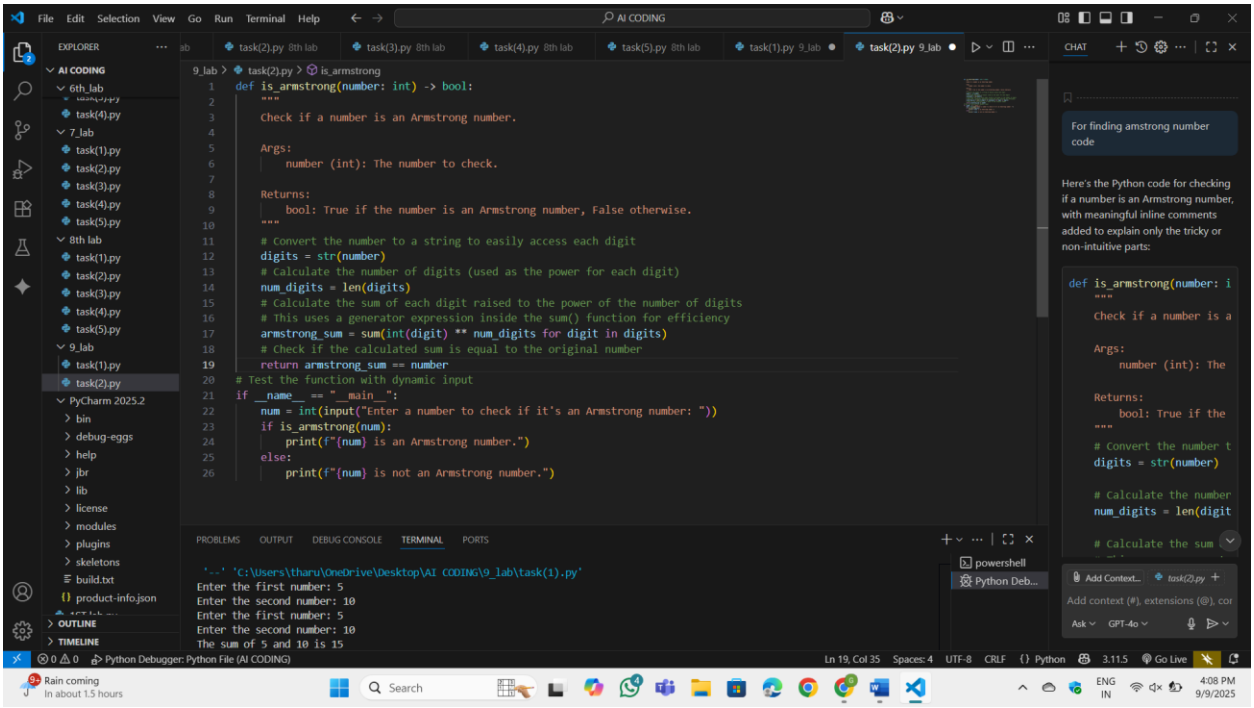
maintainability.

• Expected Output #2:

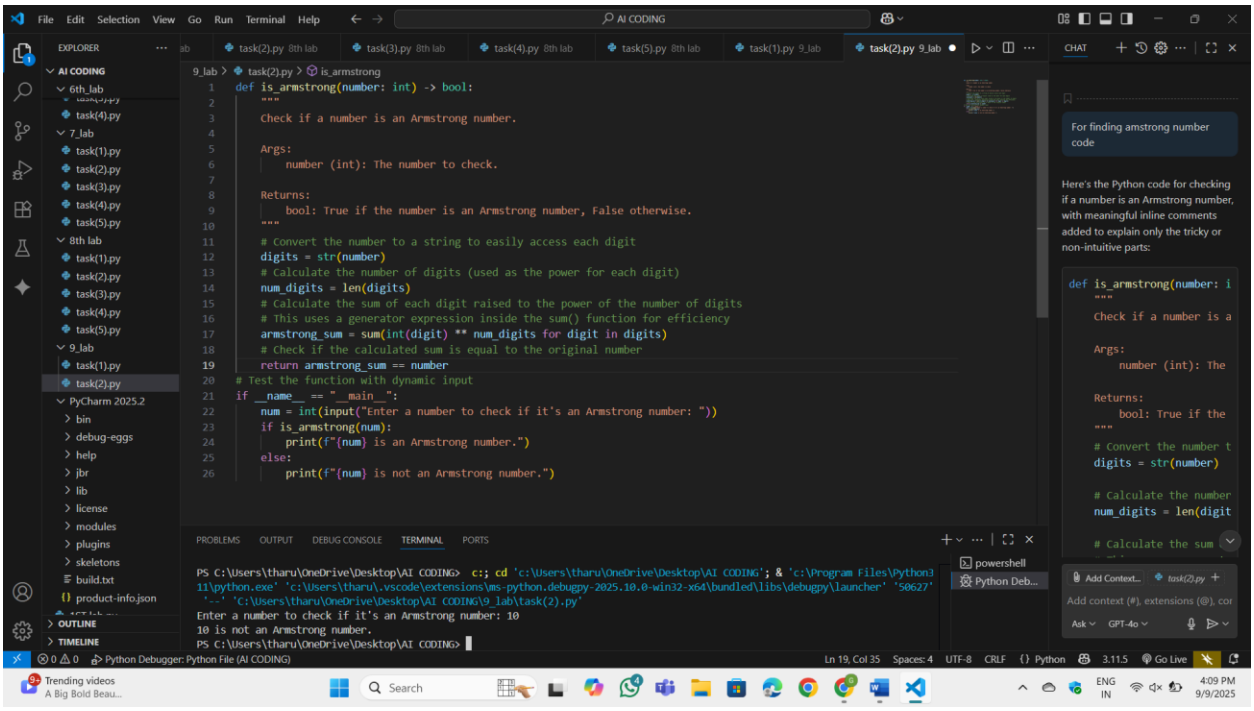
o Python code with concise, context-aware inline comments for complex logic blocks

Prompt: for the code I provided focus only on tricky or non-intuitive code sections. And add meaningful inline comments to a Python program explaining only complex logic parts

Code:



OP:



Observation:

digits = str(number): Converts the number to a string to allow iteration over its digits. num_digits = len(digits): Calculates the number of digits in the number, which determines the power to which each digit is raised. sum(int(digit) ** num_digits for digit in digits): Uses a generator expression to calculate the sum of each digit raised to the power of num_digits. This avoids creating an intermediate list, making the code more memory-efficient. return armstrong_sum == number: Compares the calculated sum to the original number to determine if it's an Armstrong number

Task-3: (Documentation – Module-Level Documentation)

• Task: Use AI to create a module-level docstring summarizing the purpose, dependencies, and main functions/classes of a Python file.

• Instructions:

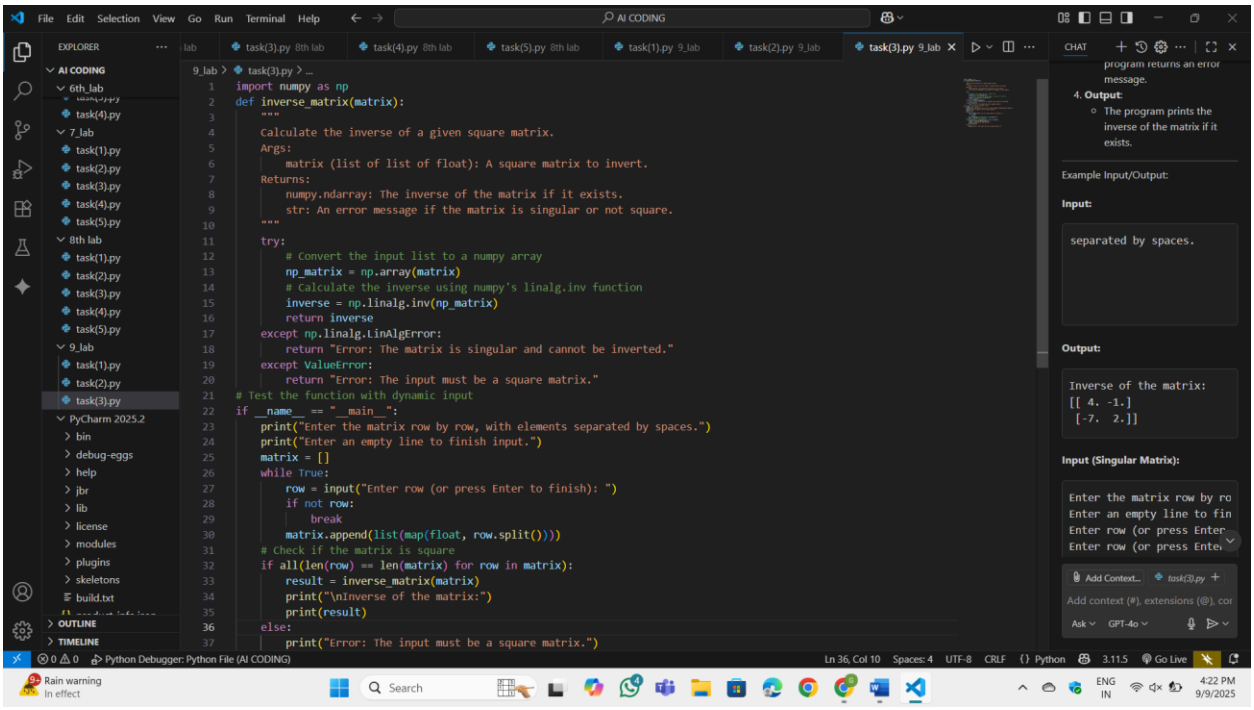
o Supply the entire Python file to AI.

o Instruct AI to write a single multi-line docstring at the top of the file.

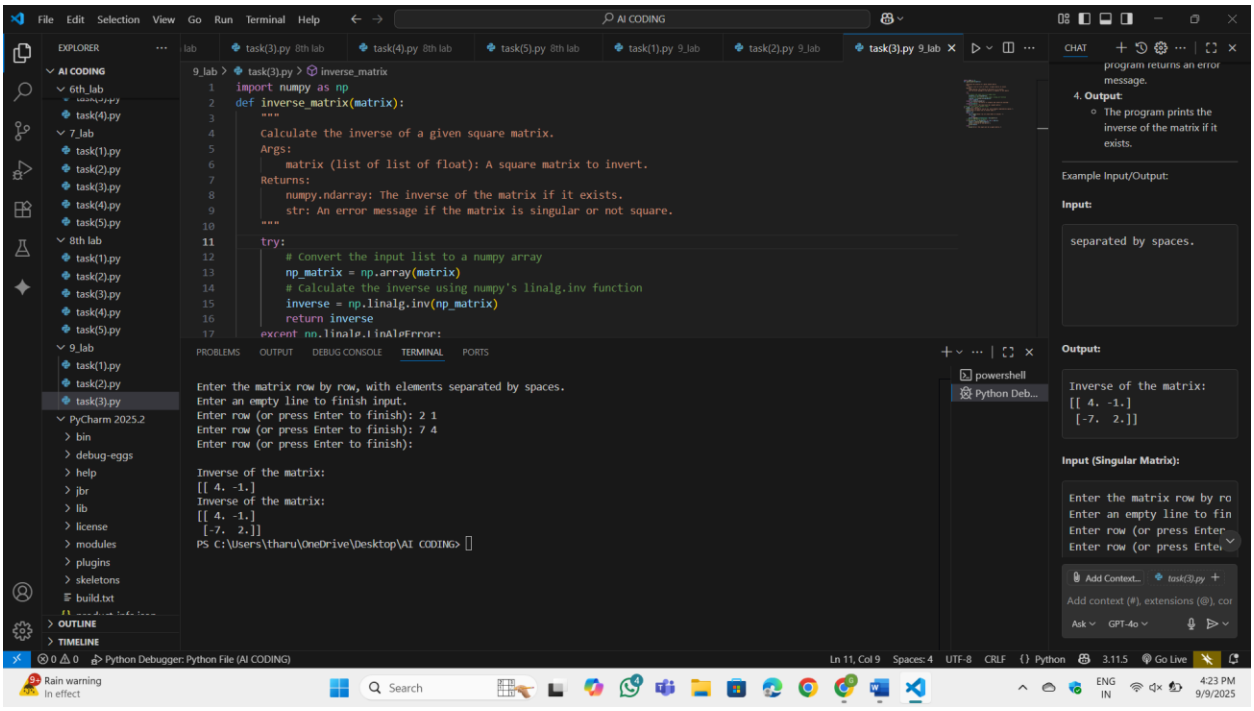
o Ensure the docstring clearly describes functionality and usage without rewriting the entire code

Prompt: for the given code describes functionality and usage without rewriting the entire code

Code:



OP:



Observation:

The numpy library is used for matrix operations.
The np.linalg.inv() function calculates the inverse of a matrix. The user inputs the matrix row by row. The input is converted into a list of lists, where each inner list represents a row. If the matrix is not square, the program returns an error message. If the matrix is singular (determinant = 0), the program returns an error message. The program prints the inverse of the matrix if it exists.

Task-4: (Documentation – Convert Comments to Structured Docstrings)

• Task: Use AI to transform existing inline comments into structured function docstrings following Google style.

• Instructions:

o Provide AI with Python code containing inline comments.

o Ask AI to move relevant details from comments into

function docstrings.

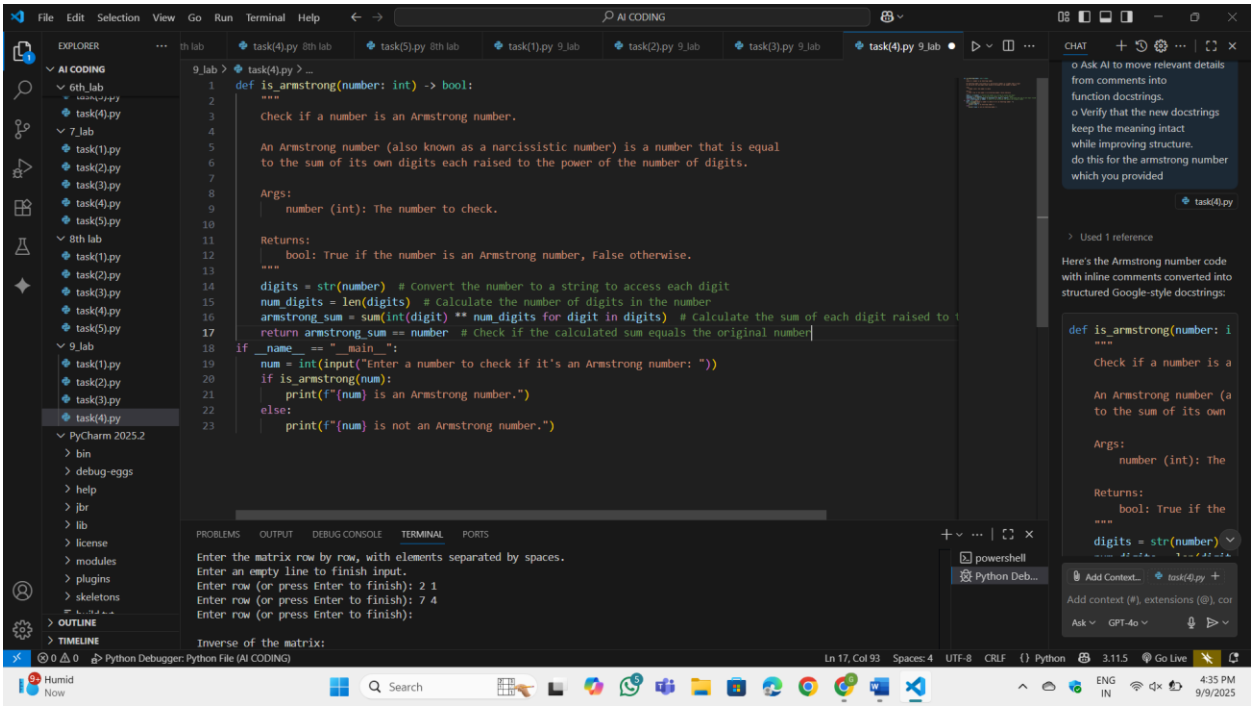
o Verify that the new docstrings keep the meaning intact while improving structure.

• Expected Output #4:

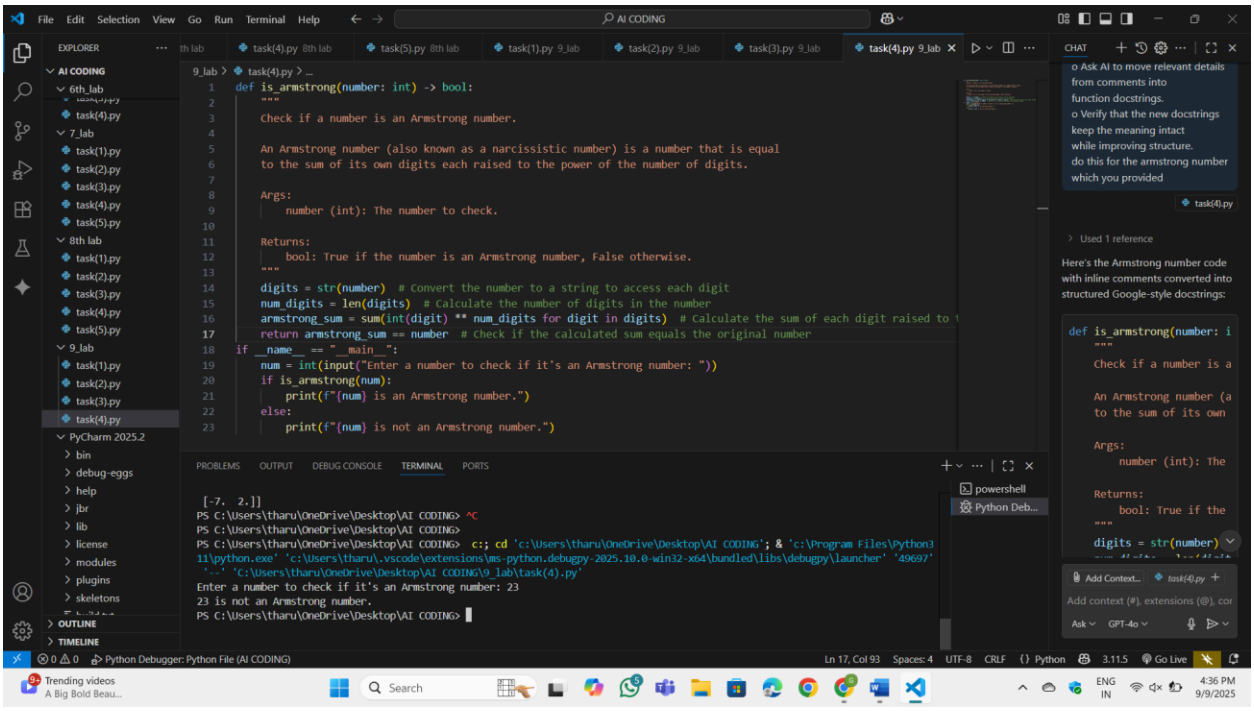
o Python code with comments replaced by clear, standardized docstrings

Prompt: convert Comments to Structured Docstrings for the code which I provided.

Code:



OP:



Observation:

Removed inline comments from the code. Added a detailed docstring to the is_armstrong function. The docstring explains: **Purpose**: What the function does. **Args**: The input parameter and its type. **Returns**: The return value and its type. **Logic**: A brief explanation of the Armstrong number concept. The docstring improves the structure and readability of the code while keeping the meaning intact

Task-5: (Documentation – Review and Correct Docstrings)

- Task: Use AI to identify and correct inaccuracies in existing docstrings.
- Instructions:

o Provide Python code with outdated or incorrect docstrings.

o Instruct AI to rewrite each docstring to match the current

code behavior.

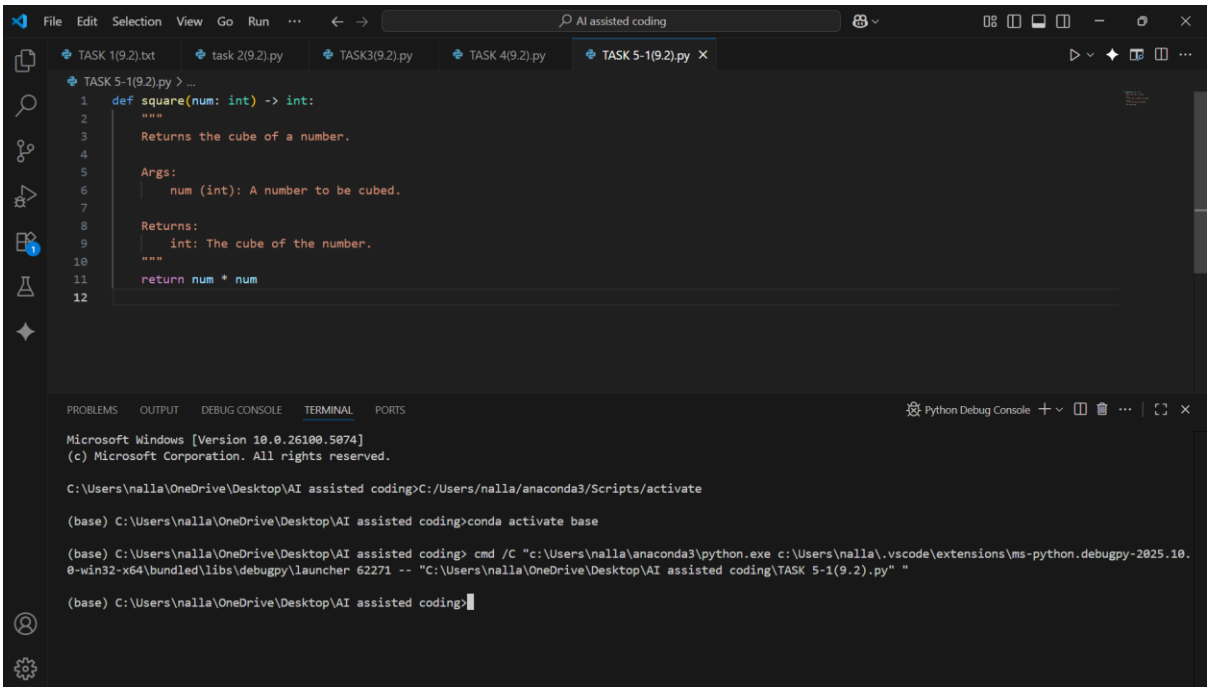
o Ensure corrections follow Google-style formatting.

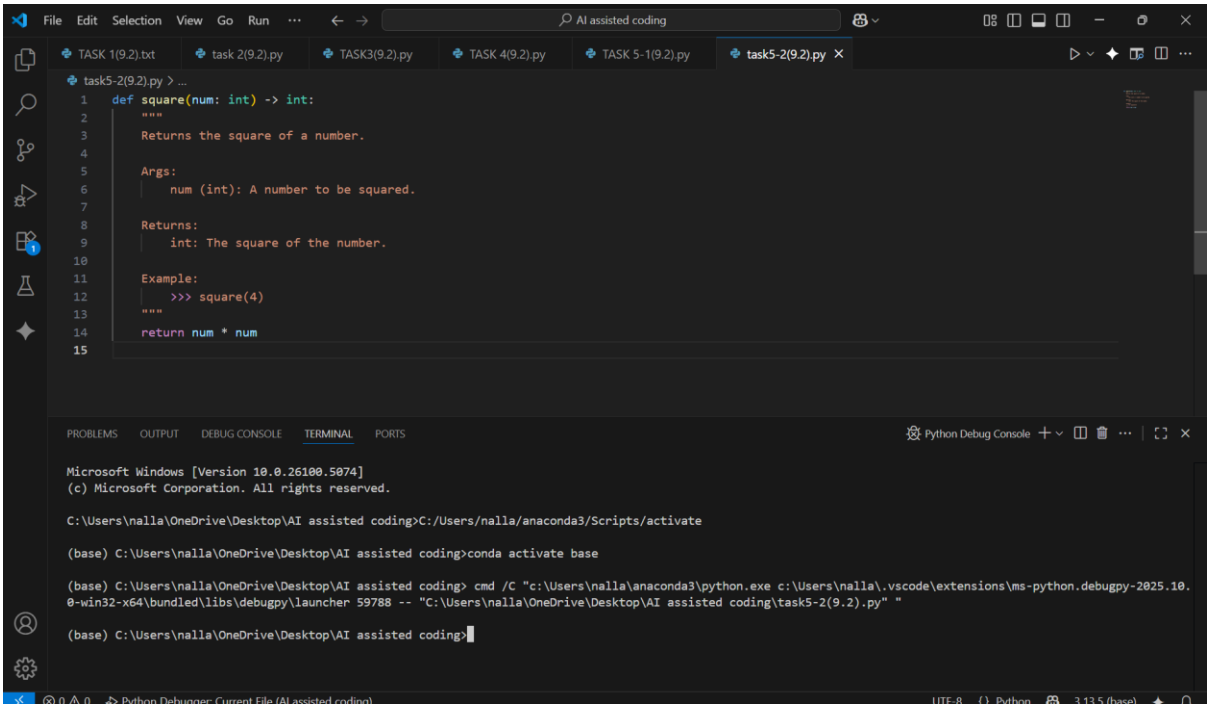
• Expected Output #5:

o Python file with updated, accurate, and standardized docstrings

Prompt: Identify and correct inaccuracies in existing docstrings.

Code:





OP:

Observation:

The main issue is docstring drift—the code changes but the documentation doesn’t. Correcting the docstrings to Google style makes the functions clearer, accurate, and easier to maintain

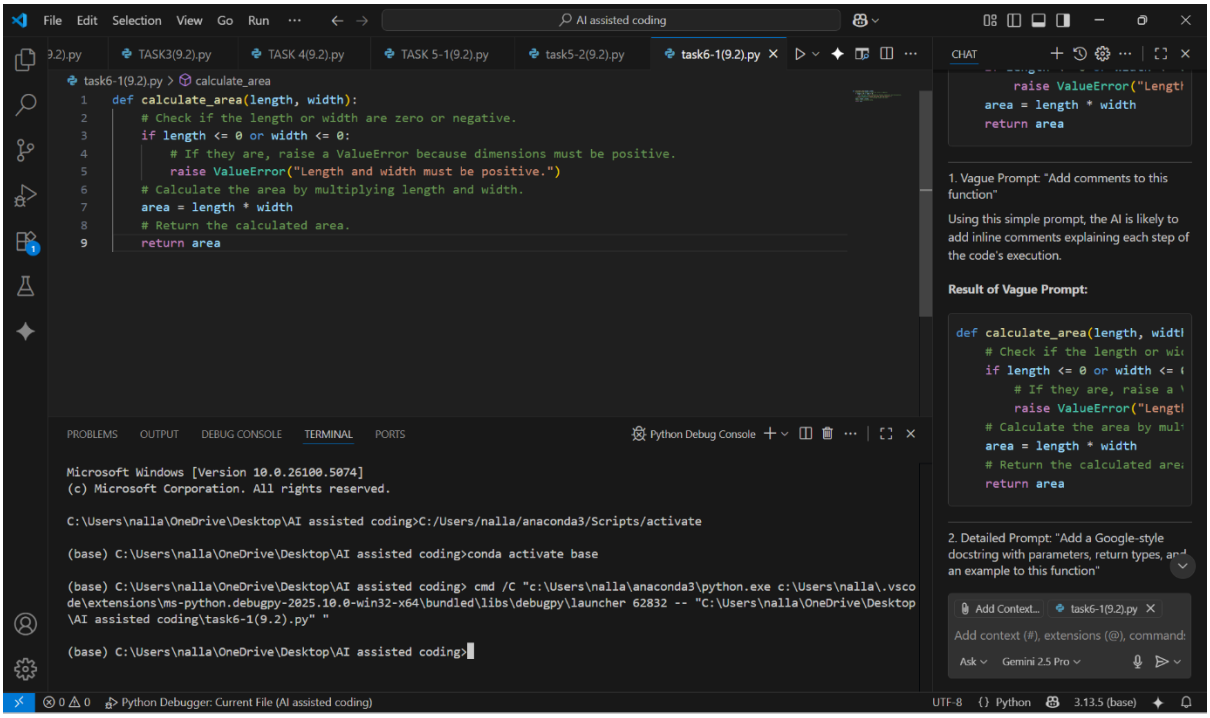
Task-6:

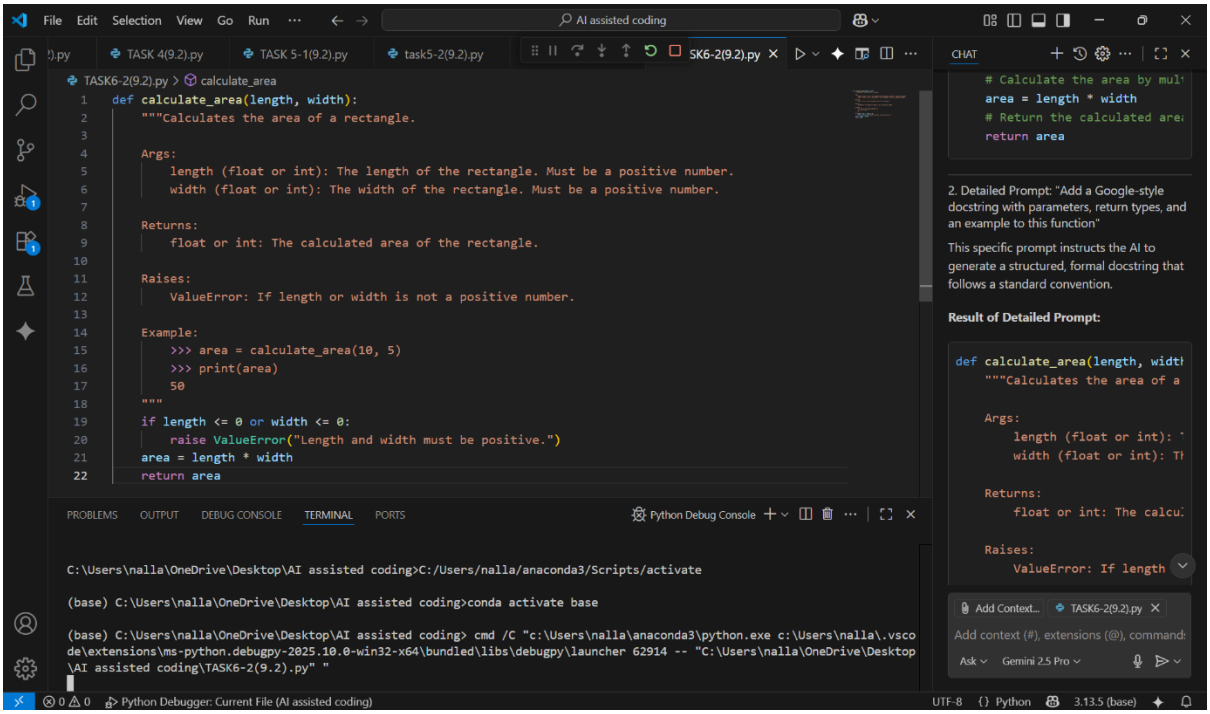
(Documentation – Prompt Comparison Experiment)

• Task: Compare documentation output from a vague prompt and a detailed prompt for the same Python function.
• Instructions:
o Create two prompts: one simple (“Add comments to this function”) and one detailed (“Add Google-style docstrings with parameters, return types, and examples”).
o Use AI to process the same Python function with both prompts.
o Analyze and record differences in quality, accuracy, and completeness.
• Expected Output #6:
o A comparison table showing the results from both prompts with observations

Prompt: Compare documentation output from a vague prompt and a detailed prompt for the same Python function. Create two prompts: one simple (“Add comments to this function”) and one detailed (“Add Google-style docstrings with parameters, return types, and examples”).

Code:





OP:

Observation:

A detailed and specific prompt yields a vastly superior documentation result. It moves beyond simple line-by-line explanations to create structured, comprehensive, and professional documentation that significantly improves code maintainability and usability.