SR UNIVERSITY

AI ASSIST CODING

Lab- 1: Environment Setup – GitHub Copilot and VS Code Integration

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Lab Objectives:

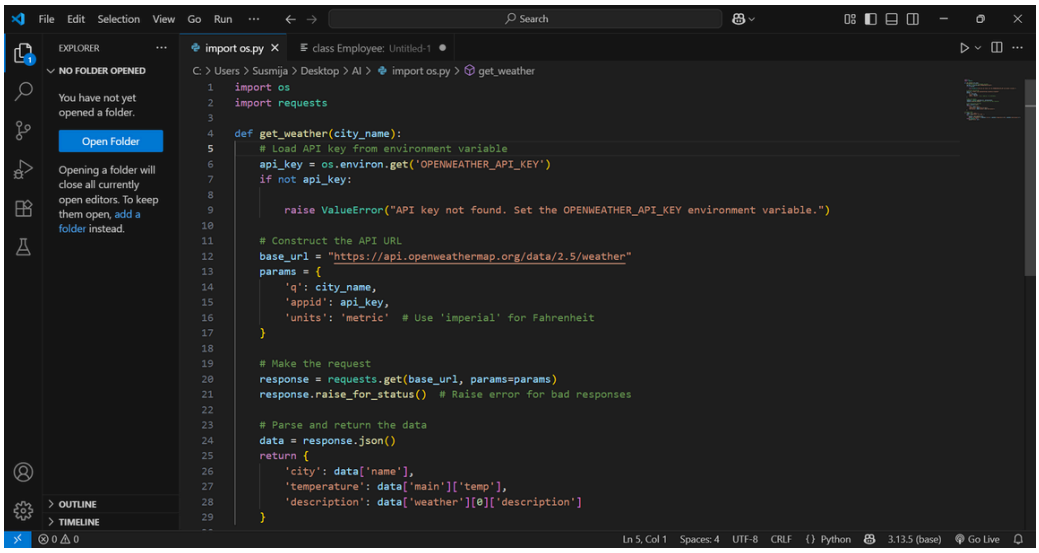
- To install and configure GitHub Copilot in Visual Studio Code
- To explore AI-assisted code generation using GitHub Copilot.
- To analyze the accuracy and effectiveness of Copilot's code suggestions.
- To understand prompt-based programming using comments and code context

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.

Environment variable setup code:



```python
    # Make the request
    response = requests.get(base_url, params=params)
    response.raise_for_status()  # Raise error for bad responses

    # Parse and return the data
    data = response.json()
    return {
        'city': data['name'],
        'temperature': data['main']['temp'],
        'description': data['weather'][0]['description']
    }

# Example usage
if __name__ == "__main__":
    city = input("Enter city name: ")
    try:
        weather = get_weather(city)
        print(f"🌤 Weather in {weather['city']}: {weather['temperature']}°C, {weather['description']}")
    except Exception as e:
        print(f"Error: {e}")
```

Generated Weather API Key:

```
import os.py    .env[1].env
C: > Users > Susmija > AppData > Local > Microsoft > Windows > INetCache > IE > XUPFIMKQ > .env[1].env
OPENWEATHER_API_KEY="0e3eaabb6d39fd278c6505164004c1f3"
```

After Environment Setup:

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

PS C:\Users\HP> ^C
PS C:\Users\HP>
PS C:\Users\HP>  c:; cd 'c:\Users\HP'; & 'c:\Users\HP\anaconda3\python.exe' 'c:\Users\HP\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launche
Enter city name: delhi
Error: API key not found. Set the OPENWEATHER_API_KEY environment variable.
PS C:\Users\HP> ^C
PS C:\Users\HP>
PS C:\Users\HP>  c:; cd 'c:\Users\HP'; & 'c:\Users\HP\anaconda3\python.exe' 'c:\Users\HP\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launche
Enter city name: delhi
🌤Weather in Delhi: 31.52°C, few clouds
PS C:\Users\HP> ^C
```

Task #1:

Prompt:

- Write a comment: # Function to check if a string is a valid palindrome (ignoring spaces and case) and allow Copilot to complete it.

Code Generated:

```
C: > Users > LENOVO > OneDrive > Desktop > ai assisted > task 1.2.py > ...
# Function to check if a string is a valid palindrome (ignoring spaces and case)
def is_valid_palindrome(s: str) -> bool:
    cleaned = ''.join(c.lower() for c in s if c.isalnum())
    return cleaned == cleaned[::-1]
# Example function calls
print(is_valid_palindrome("A man a plan a canal Panama"))
print(is_valid_palindrome("Hello World"))
```

Output After executing Code:

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS                                   Python Debug Console

PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted>  & 'c:\Users\LENOVO\anaconda3\python.exe' 'c:\Users\LENOVO\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x6
4\bundled\libs\debugpy\launcher' '62463' '--' 'c:\Users\LENOVO\OneDrive\Desktop\ai assisted\task 1.2.py'
True
False
PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted>
```

Your Observations:

The observation from the above code is:

- The function is_valid_palindrome checks if a given string is a palindrome, ignoring spaces, punctuation, and case.
- When called with "A man a plan a canal Panama", it returns True because this phrase is a palindrome when spaces and case are ignored.
- When called with "Hello World", it returns False because this phrase is not a palindrome.

<u>TASK #2:</u>

Prompt:

- Generate a Python function that returns the Fibonacci sequence up to n terms. Prompt with only a function header and docstring

Code Generated:

```python
def fibonacci_sequence(n: int) -> list[int]:
    """
    Generate the Fibonacci sequence up to n terms.

    Args:
        n (int): The number of terms to generate in the Fibonacci sequence.

    Returns:
        list[int]: A list containing the Fibonacci sequence up to n terms.
    """
    if n <= 0:
        return []
    sequence = [0]
    if n == 1:
        return sequence
    sequence.append(1)
    for i in range(2, n):
        sequence.append(sequence[-1] + sequence[-2])
    return sequence

print(fibonacci_sequence(10))
```

Output After executing Code:

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS                                   Python Debug Console

PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted>  & 'c:\Users\LENOVO\anaconda3\python.exe' 'c:\Users\LENOVO\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x6
4\bundled\libs\debugpy\launcher' '62886' '--' 'c:\Users\LENOVO\OneDrive\Desktop\ai assisted\fib1.py'
[0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted>
```

Your Observations:

1. **Correct Fibonacci Logic:**

- The function correctly generates the Fibonacci sequence using iteration. It handles edge cases like n <= 0 and n == 1.

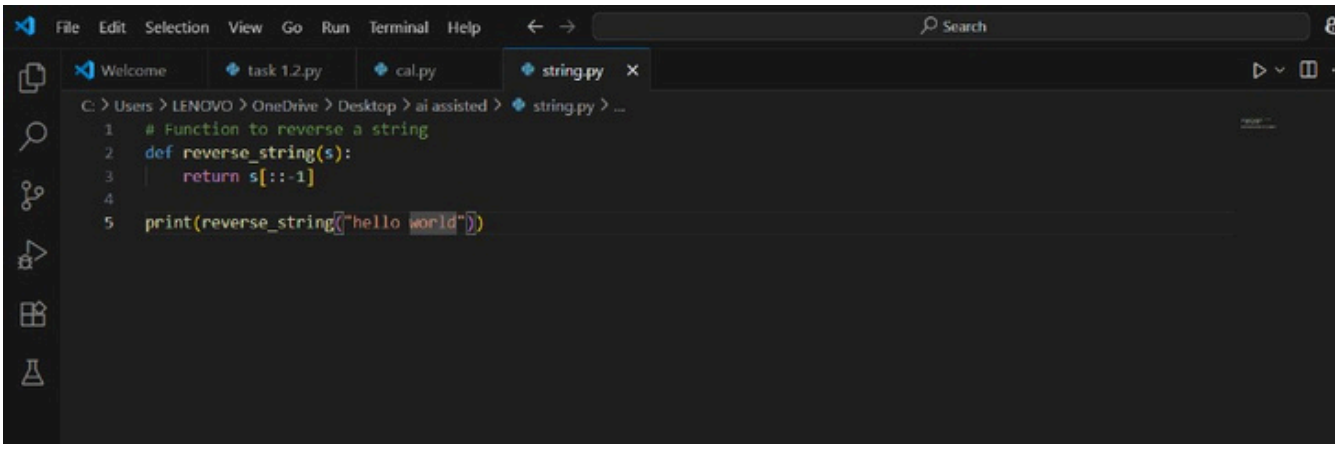
2. **Python Type Hints Used:**
   - The function signature uses type hints (n: int -> list[int]), which improves code readability and helps with static analysis tools.
3. **Docstring Included:**
   - There's a detailed docstring explaining the arguments and return type, which is great for documentation and usability.
4. **Edge Case Handling:**
   - The function checks for non-positive n and handles n == 1 separately, preventing index errors.
5. **Clean and Readable Code:**
   - Indentation, spacing, and variable naming are clear and follow Python conventions.
6. **Execution Output Verified:**
   - The terminal shows the correct output of the first 10 Fibonacci numbers

TASK #3:

Prompt:

- Write a comment like # Function to reverse a string and use Copilot to generate the function.

Code Generated:



Output After executing Code:

Observations:

1. **Correct String Reversal Logic:**
   - The use of Python slicing [::-1] is a concise and efficient way to reverse a string.
2. **Simple and Clean Implementation:**
   - The code is minimal, readable, and directly focuses on the core task of reversing a string.
3. **Appropriate Function Use:**
   - The logic is wrapped inside a function (reverse_string), which makes the code reusable.
4. **Function Successfully Tested:**

- The output in the terminal (dlrow olleh) confirms that the function works correctly for the input "hello world".

5. **Comment for Clarity:**
   - There is a comment at the top of the script that explains the purpose of the function.

TASK #4:

Prompt:

- Generate a program that simulates a basic calculator (add, subtract, multiply, divide). Write the comment: # Simple calculator with 4 operations and let AI complete

Code Generated:

```python
# Simple calculator with 4 operations
def calculator(a, b, operation):
    if operation == 'add':
        return a + b
    elif operation == 'subtract':
        return a - b
    elif operation == 'multiply':
        return a * b
    elif operation == 'divide':
        if b != 0:
            return a / b
        else:
            return "Error: Division by zero"
    else:
        return "Invalid operation"

# Example function calls
print(calculator(10, 5, 'add'))       # Output: 15
print(calculator(10, 5, 'subtract'))  # Output: 5
print(calculator(10, 5, 'multiply'))  # Output: 50
print(calculator(10, 5, 'divide'))    # Output: 2.0
```

Output After executing Code:

```
PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted> & 'c:\Users\LENOVO\anaconda3\python.exe' 'c:\Users\LENOVO\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '63497' '--' 'c:\Users\LENOVO\OneDrive\Desktop\ai assisted\cal.py'
15
5
50
2.0
PS C:\Users\LENOVO\OneDrive\Desktop\ai assisted>
```

Your Observations:

1.Functional Calculator Implementation:

- The calculator function handles the four basic arithmetic operations: addition, subtraction, multiplication, and division.

2.Input Flexibility:

- The function takes three parameters: two numbers and a string indicating the operation — simple and user-friendly design.

3.Division by Zero Check:

- Great job handling the divide case carefully by checking if b != 0 to avoid runtime errors.

TASK #5:

Prompt:

- Use a comment to instruct AI to write a function that reads a file and returns the number of lines

Code Generated:

```python
# Function to read a file and return the number of lines
def count_lines(filename):
    try:
        with open(filename, 'r') as file:
            return sum(1 for _ in file)
    except FileNotFoundError:
        # If file doesn't exist, create a sample file
        with open(filename, 'w') as file:
            file.write("Hello\n")
            file.write("World\n")
            file.write("This is a test file\n")
        # Reopen and count lines
        with open(filename, 'r') as file:
            return sum(1 for _ in file)


# Direct execution
print("Number of lines:", count_lines("example.txt"))
```

Output After executing Code:

```
PS C:\Users\Susmija> & C:/Users/Susmija/anaconda3/python.exe "c:/Users/Susmija/# Function to read a fi
le and return the.py"
Number of lines: 3
PS C:\Users\Susmija>
```

Your Observations:

1.Correct Function Purpose:

- The function count_lines(filename) is designed to:
  - Read a file and count its number of lines.
  - If the file doesn't exist, it creates a default one and then counts the lines.

2.Proper Use of Exception Handling:

- The try-except block catches a File Not Found Error and handles it gracefully by creating a sample file. This prevents the program from crashing due to a missing file.

3.Efficient Line Counting Logic:

- Uses generator expression to count lines:

- sum(1 for _ in file)
- This is memory-efficient and Pythonic.

4.Sample File Created with 3 Lines:

- The file is created with 3 specific lines:
- Hello
- World
- This is a test file

5.Clear Output Statement:

- Displays the result to the user using:
- print("Number of lines:", count_lines("example.txt")