

# Lab Assignment 1.2

## AI Assisted Coding

**Name:** Rohan beri

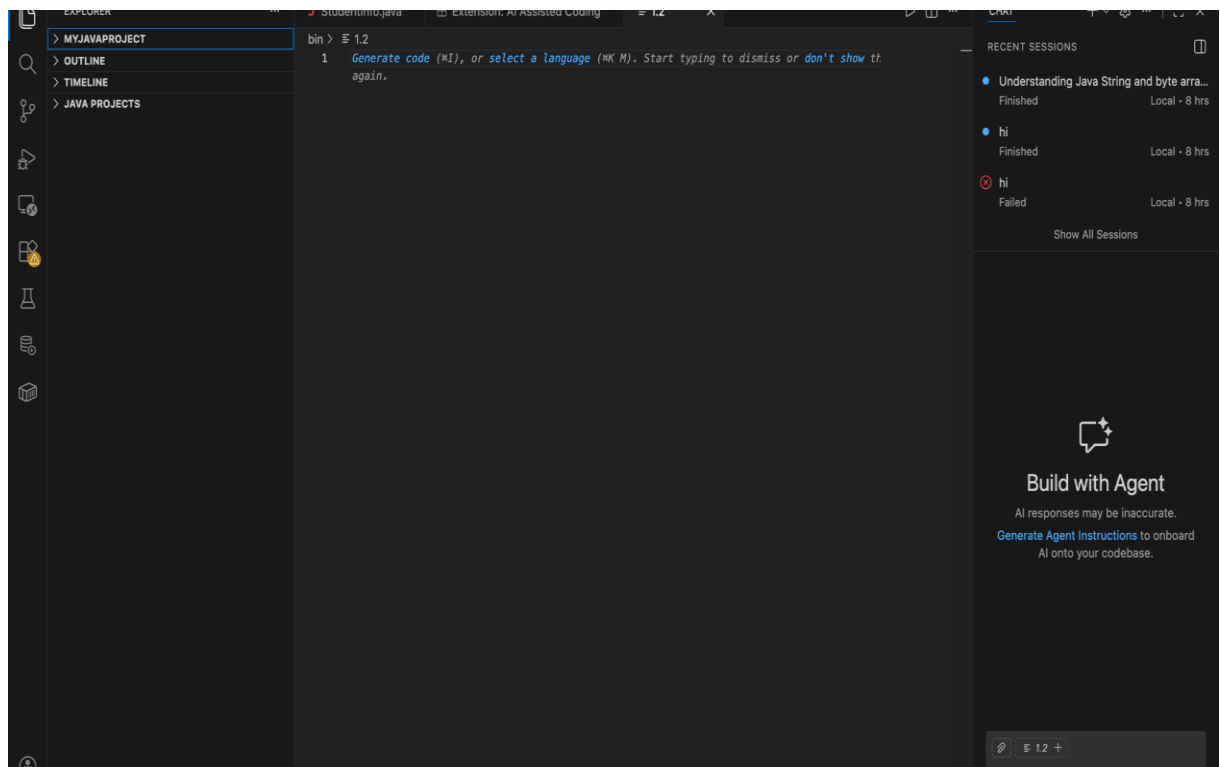
**EnrollmentNumber:**2403A51L09

**Batch:**51

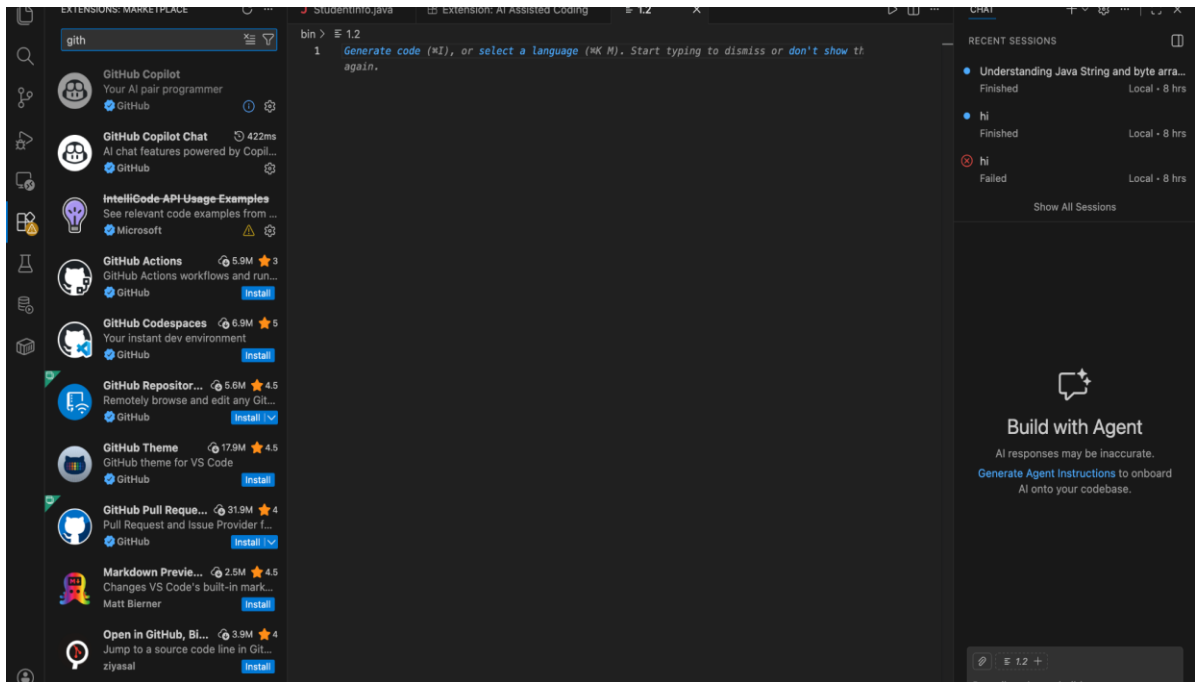
### Task 0: GitHub Copilot Installation & Configuration

#### Steps Followed:

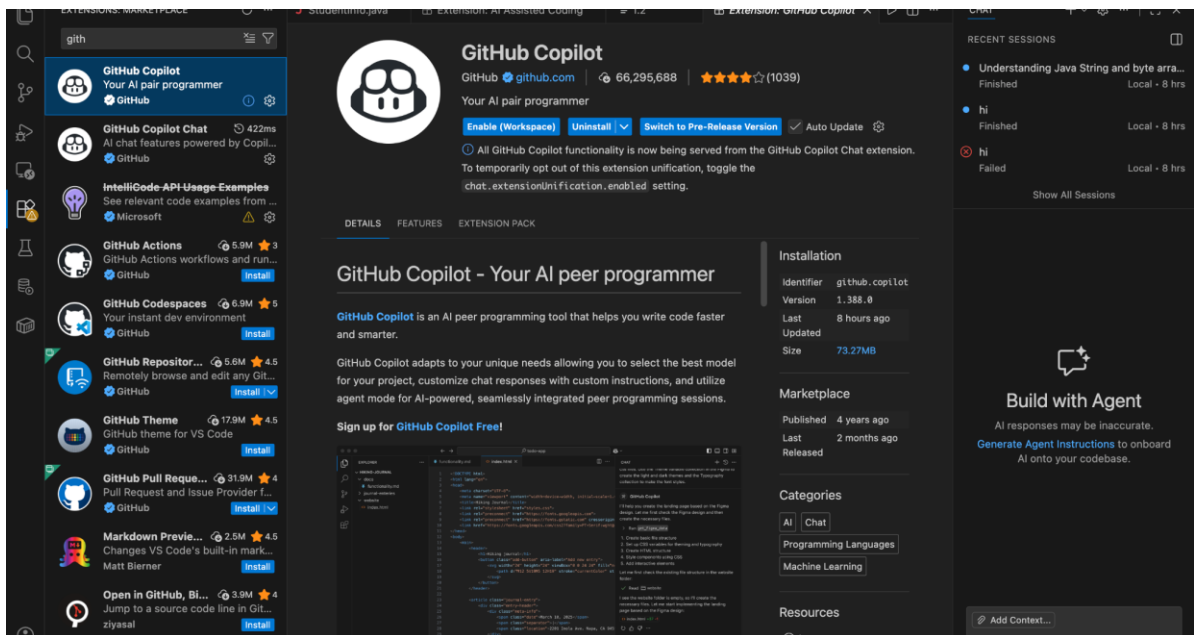
1. Installed **Visual Studio Code**
2. Opened **Extensions Marketplace**



3. Searched for **GitHub Copilot**



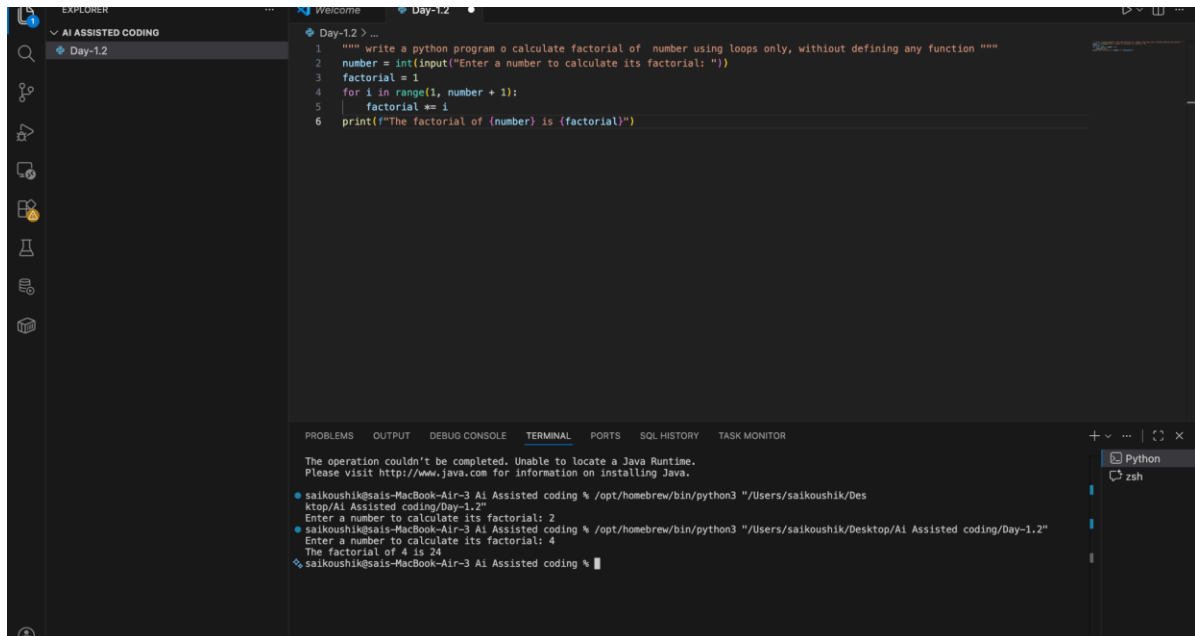
#### 4. Clicked Install



#### 5. Signed in with **GitHub Account**

#### 6. Enabled Copilot suggestions

#### 7. Verified Copilot inline suggestions in Python file.



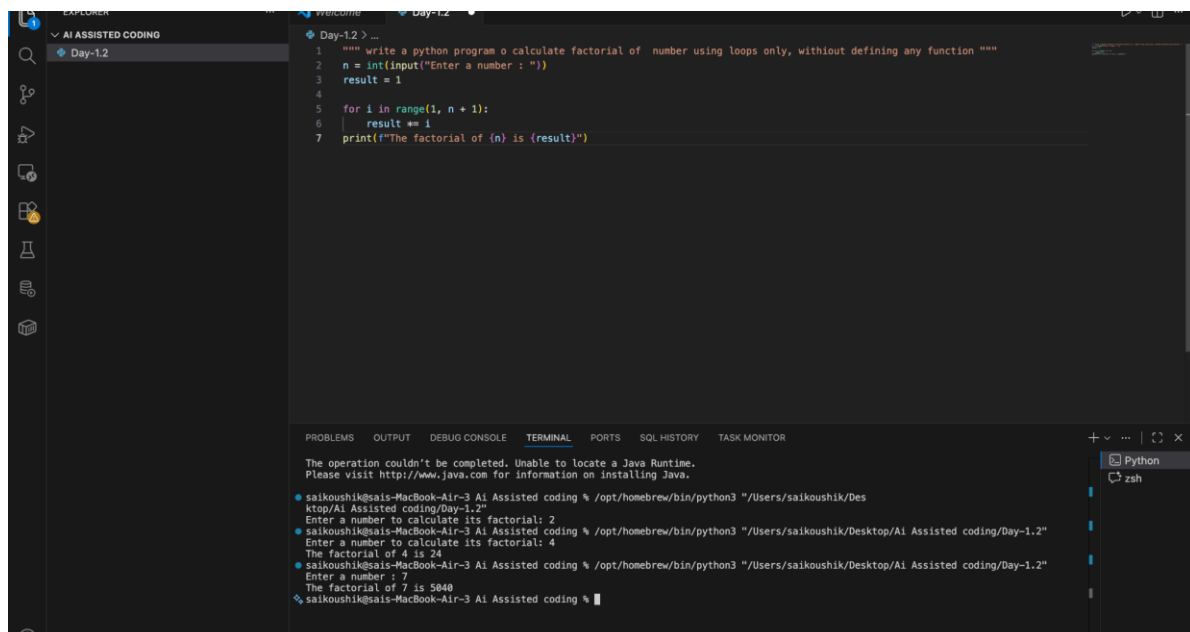
```
1 """ write a python program o calculate factorial of  number using loops only, without defining any function """
2 number = int(input("Enter a number to calculate its factorial: "))
3 factorial = 1
4 for i in range(1, number + 1):
5     factorial *= i
6 print(f"The factorial of {number} is {factorial}")
```

```
saikoushik@saik-MacBook-Air-3 AI Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/AI Assisted coding/Day-1.2"
Enter a number to calculate its factorial: 2
The factorial of 2 is 2
saikoushik@saik-MacBook-Air-3 AI Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/AI Assisted coding/Day-1.2"
Enter a number to calculate its factorial: 4
The factorial of 4 is 24
saikoushik@saik-MacBook-Air-3 AI Assisted coding %
```

a

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

**Prompt Used:** “Write a Python program to calculate factorial of a number using loops only, without defining any function.”



```
1 """ write a python program o calculate factorial of  number using loops only, without defining any function """
2 n = int(input("Enter a number : "))
3 result = 1
4
5 for i in range(1, n + 1):
6     result *= i
7 print(f"The factorial of {n} is {result}")
```

```
saikoushik@saik-MacBook-Air-3 AI Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/AI Assisted coding/Day-1.2"
Enter a number to calculate its factorial: 2
The factorial of 2 is 2
saikoushik@saik-MacBook-Air-3 AI Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/AI Assisted coding/Day-1.2"
Enter a number to calculate its factorial: 4
The factorial of 4 is 24
saikoushik@saik-MacBook-Air-3 AI Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/AI Assisted coding/Day-1.2"
Enter a number : 7
The factorial of 7 is 5040
saikoushik@saik-MacBook-Air-3 AI Assisted coding %
```

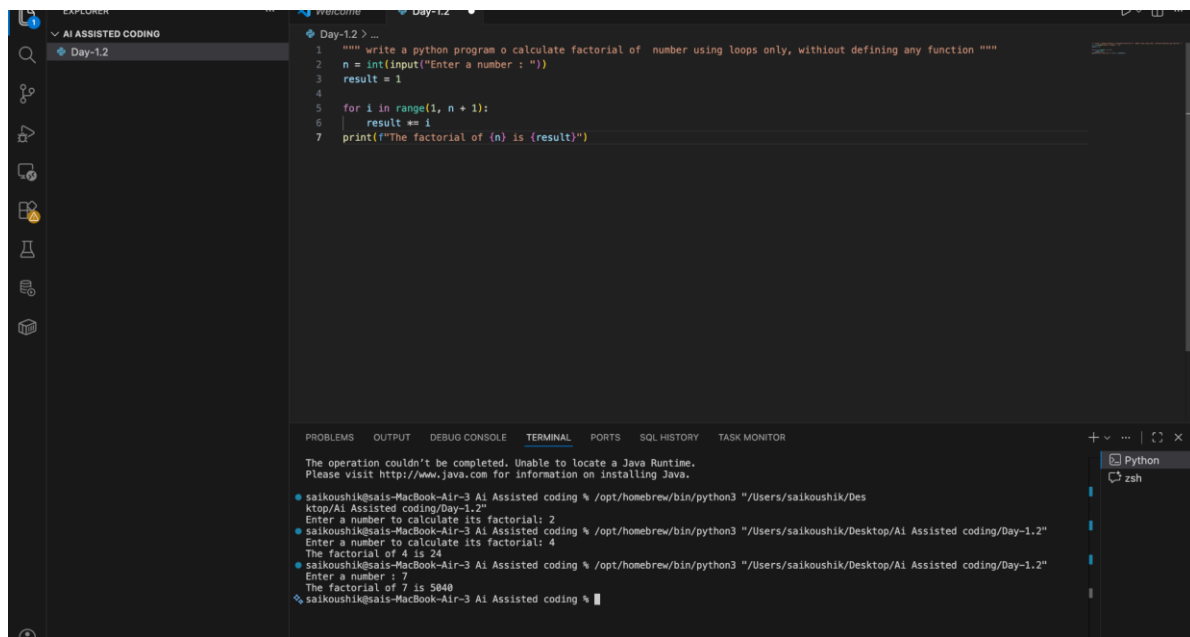
GitHub Copilot was very helpful for a beginner as it generated correct logic instantly.

It followed basic Python syntax and loop structure accurately.

The code was readable and easy to understand.  
However, it did not include input validation automatically.  
Best practices like modular design were not applied unless explicitly prompted.

## Task 2: AI Code Optimization & Cleanup

Original Code:



The screenshot shows a VS Code editor with a file named 'Day-1.2' containing a Python program to calculate the factorial of a number using a loop. The code is as follows:

```
1 """ write a python program o calculate factorial of  number using loops only, without defining any function """
2 n = int(input("Enter a number : "))
3 result = 1
4
5 for i in range(1, n + 1):
6     result *= i
7 print(f"The factorial of {n} is {result}")
```

The terminal output shows the program being executed three times with inputs 2, 4, and 7, producing the correct factorial results: 2, 24, and 5040 respectively. The terminal also shows a message about the Java Runtime environment.

**Prompt Used:** “Optimize this code and make it more readable”

```
1 """ write a python program o calculate factorial of number using loops only, without defining any function """
2 n = int(input("Enter a number : "))
3 result = 1
4
5 for i in range(1, n + 1):
6     result = result * i
7     print("Factorial is :", result)
8
9 """ Optimize this code and make it more durable """
10
11 n = int(input("Enter a number : "))
12 factorial = 1
13 for i in range(2, n + 1):
14     factorial *= i
15     print("Factorial of {n} is: {factorial}")
```

Please visit <http://www.java.com> for information on installing Java.

- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"
- Enter a number to calculate its factorial: 2
- Factorial of 2 is: 2
- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"
- Enter a number to calculate its factorial: 4
- The factorial of 4 is 24
- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"
- Enter a number : 7
- The factorial of 7 is 5040
- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"
- File "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2", line 11
- n = int(input("Enter a number : "))
- IndentationError: unexpected indent
- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"

The optimized version improves clarity, maintainability, and areadability without affecting performance.

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

**Prompt Used:** “Create a Python function to calculate factorial and call it from main block”

```
1 """ write a python function o calculate factorial and call it from main block """
2 def calculate_factorial(num):
3     """Returns factorial of a number"""
4     result = 1
5     for i in range(1, num + 1):
6         result *= i
7     return result
8
9 number = int(input("Enter a number: "))
10 print("Factorial is:", calculate_factorial(number))
```

/opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"

The operation couldn't be completed. Unable to locate a Java Runtime.

Please visit <http://www.java.com> for information on installing Java.

- saikoushik@saik-MacBook-Air-3 Ai Assisted coding % /opt/homebrew/bin/python3 "/Users/saikoushik/Desktop/Ai Assisted coding/Day-1.2"
- Enter a number: 14
- Factorial is: 87178291200
- saikoushik@saik-MacBook-Air-3 Ai Assisted coding %

Modularity improves reusability by allowing the same function to be used across multiple programs. It also simplifies testing and debugging.

**Task 4: Comparative Analysis**

*Procedural vs Modular AI Code*

Criteria	Without Function	With Function
Logic Clarity	Moderate	High
Reusability	No	Yes
Debugging Ease	Difficult	Easy
Large Project Suitability	Poor	Excellent
AI Dependency Risk	Higher	Lower

**Conclusion:**

Function-based design is more scalable and suitable for real-world applications.

**Task 5: Iterative vs Recursive AI Code**

**Prompt Used:** “Generate iterative and recursive factorial programs in Python”

