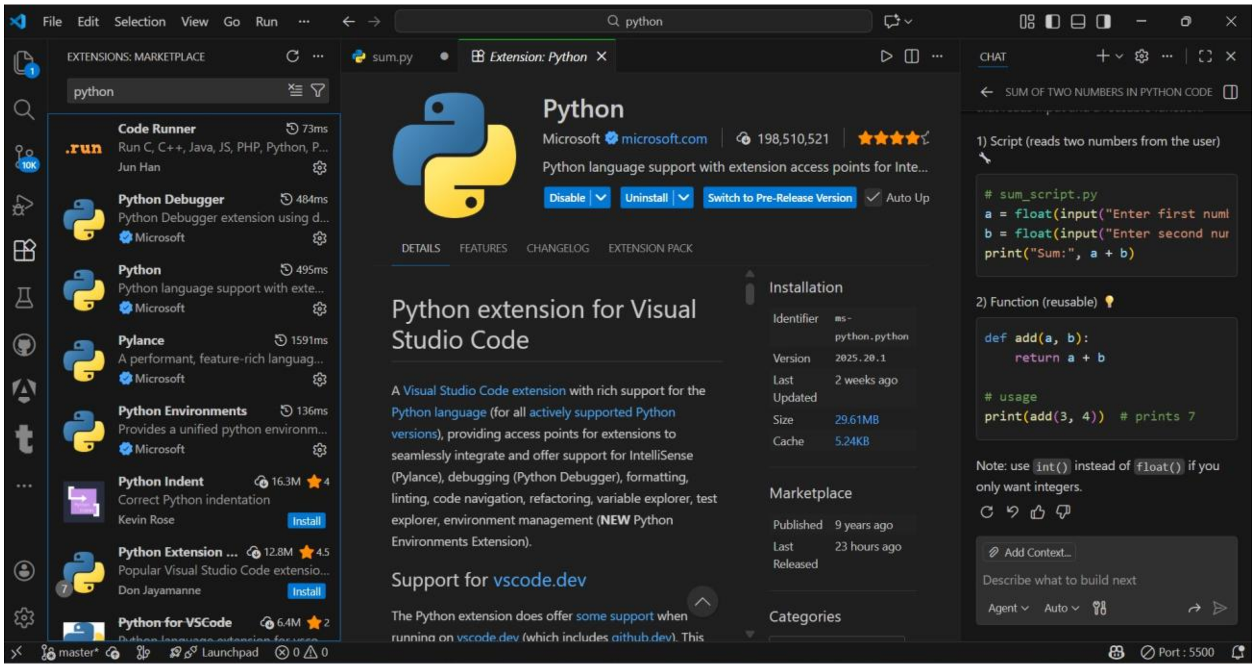
Lab Assignment - 1.3

H.T NO-2303A51511
K.PRADEEP REDDY



EXTENSIONS: MARKETPLACE — python

Code Runner	Run C, C++, Java, JS, PHP, Python, P...	Jun Han
Python Debugger	Python Debugger extension using d...	Microsoft
Python	Python language support with exte...	Microsoft
Pylance	A performant, feature-rich languag...	Microsoft
Python Environments	Provides a unified python environm...	Microsoft
Python Indent	Correct Python indentation	Kevin Rose
Python Extension ...	Popular Visual Studio Code extensio...	Don Jayamanne
Python for VSCode		

Python
Microsoft microsoft.com | 198,510,521
Python language support with extension access points for Inte...

Python extension for Visual Studio Code

A Visual Studio Code extension with rich support for the Python language (for all actively supported Python versions), providing access points for extensions to seamlessly integrate and offer support for IntelliSense (Pylance), debugging (Python Debugger), formatting, linting, code navigation, refactoring, variable explorer, test explorer, environment management (**NEW** Python Environments Extension).

Support for vscode.dev

The Python extension does offer some support when running on vscode.dev (which includes github.dev). This

Installation

Identifier	ms-python.python
Version	2025.20.1
Last Updated	2 weeks ago
Size	29.61MB
Cache	5.24KB

Marketplace

Published	9 years ago
Last Released	23 hours ago

CHAT — SUM OF TWO NUMBERS IN PYTHON CODE

1) Script (reads two numbers from the user)

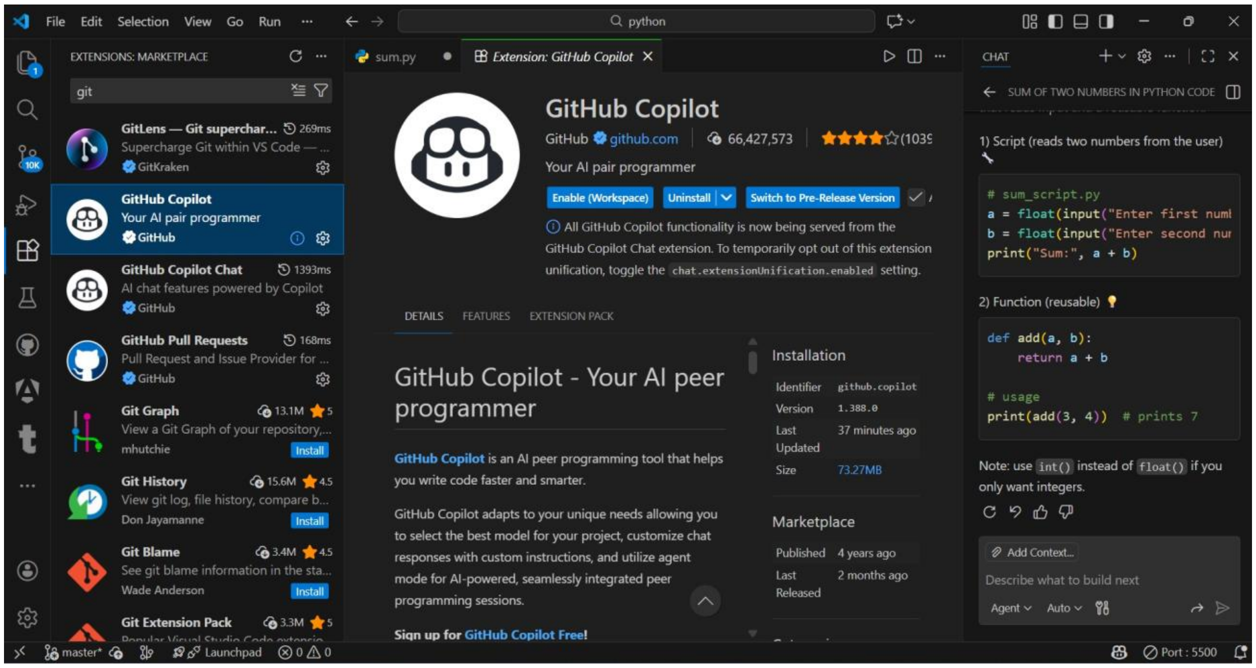
```python
# sum_script.py
a = float(input("Enter first numl
b = float(input("Enter second nur
print("Sum:", a + b)
```

2) Function (reusable)

```python
def add(a, b):
    return a + b

# usage
print(add(3, 4))  # prints 7
```

Note: use `int()` instead of `float()` if you only want integers.



EXTENSIONS: MARKETPLACE — git

GitLens — Git superchar...	Supercharge Git within VS Code — ...	GitKraken
GitHub Copilot	Your AI pair programmer	GitHub
GitHub Copilot Chat	AI chat features powered by Copilot	GitHub
GitHub Pull Requests	Pull Request and Issue Provider for ...	GitHub
Git Graph	View a Git Graph of your repository,...	mhutchie
Git History	View git log, file history, compare b...	Don Jayamanne
Git Blame	See git blame information in the sta...	Wade Anderson
Git Extension Pack		

GitHub Copilot
GitHub github.com | 66,427,573
Your AI pair programmer

All GitHub Copilot functionality is now being served from the GitHub Copilot Chat extension. To temporarily opt out of this extension unification, toggle the `chat.extensionUnification.enabled` setting.

GitHub Copilot - Your AI peer programmer

GitHub Copilot is an AI peer programming tool that helps you write code faster and smarter.

GitHub Copilot adapts to your unique needs allowing you to select the best model for your project, customize chat responses with custom instructions, and utilize agent mode for AI-powered, seamlessly integrated peer programming sessions.

Sign up for GitHub Copilot Free!

Installation

Identifier	github.copilot
Version	1.388.0
Last Updated	37 minutes ago
Size	73.27MB

Marketplace

Published	4 years ago
Last Released	2 months ago

CHAT — SUM OF TWO NUMBERS IN PYTHON CODE

1) Script (reads two numbers from the user)

```python
# sum_script.py
a = float(input("Enter first numl
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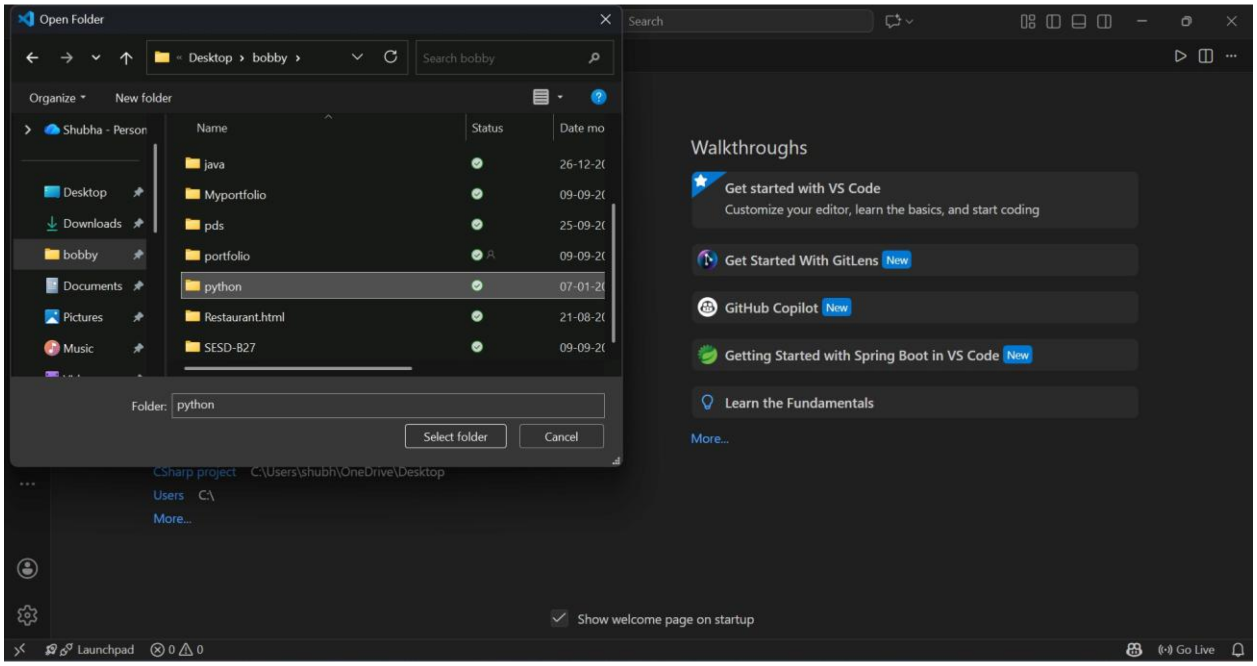
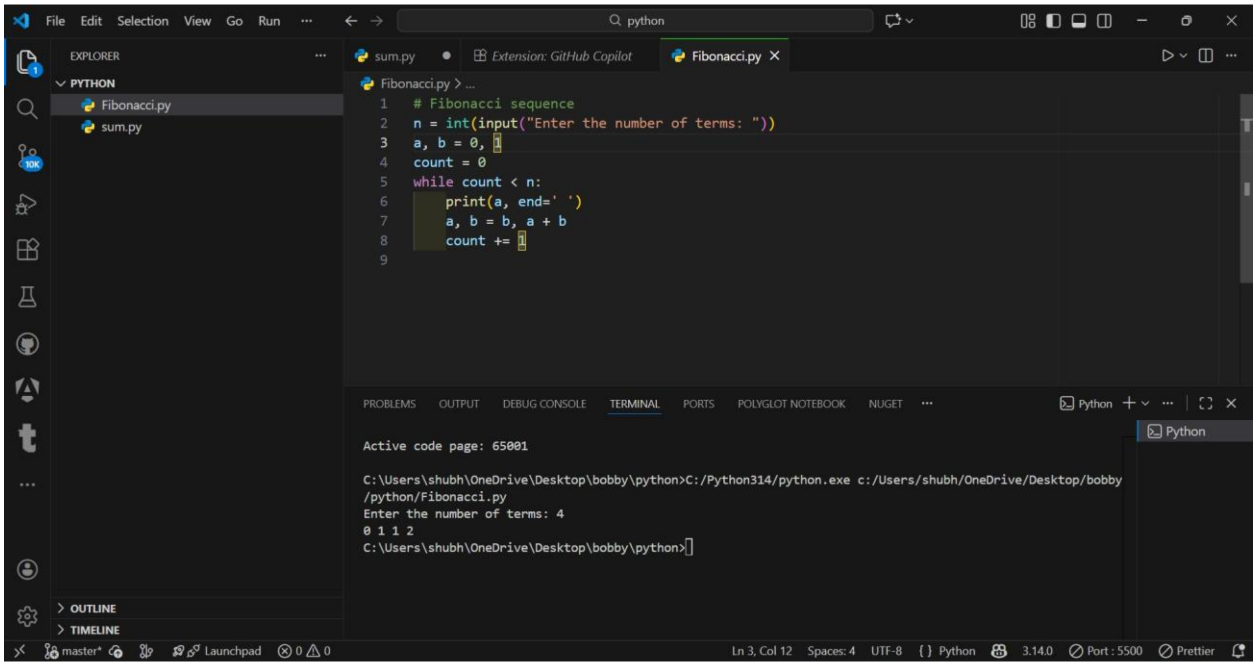


Task 1: AI-Generated Logic Without Modularization (Procedural Fibonacci) :

`# Fibonacci sequence`



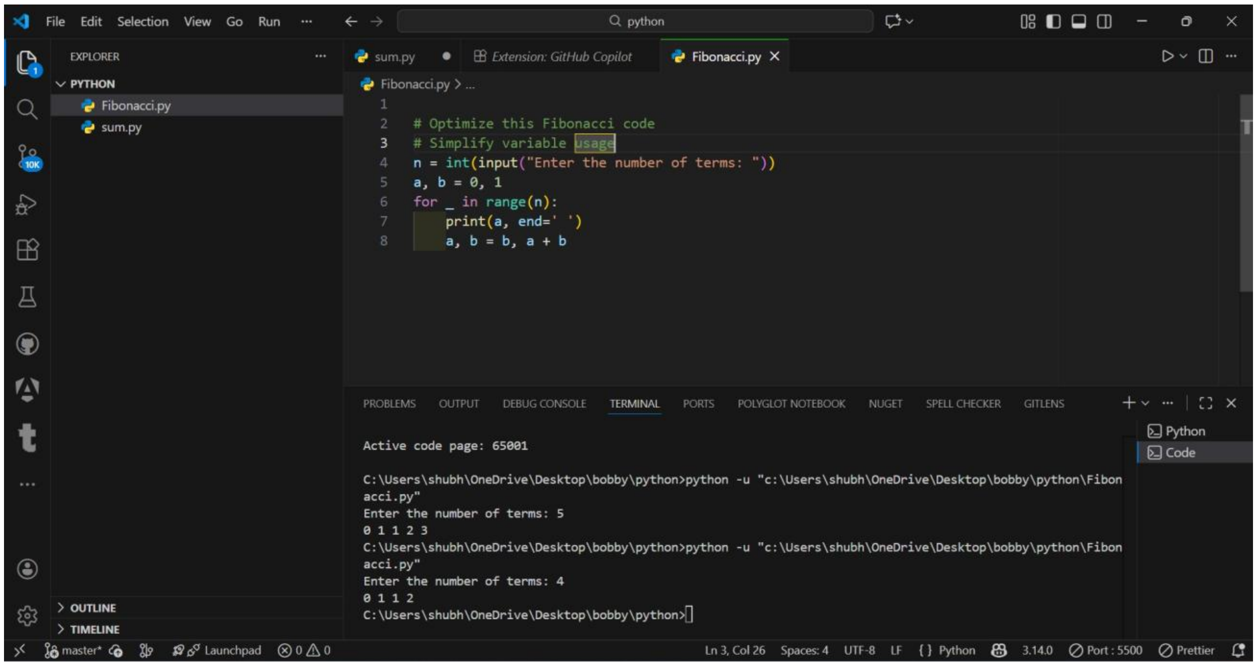
```python
# Fibonacci sequence
n = int(input("Enter the number of terms: "))
a, b = 0, 1
count = 0
while count < n:
    print(a, end=' ')
    a, b = b, a + b
    count += 1
```

```
Active code page: 65001

C:\Users\shubh\OneDrive\Desktop\bobby\python>C:/Python314/python.exe c:/Users/shubh/OneDrive/Desktop/bobby
/python/Fibonacci.py
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>
```

Task 2: AI Code Optimization & Cleanup :

# Optimize this Fibonacci code

# Simplify variable usage

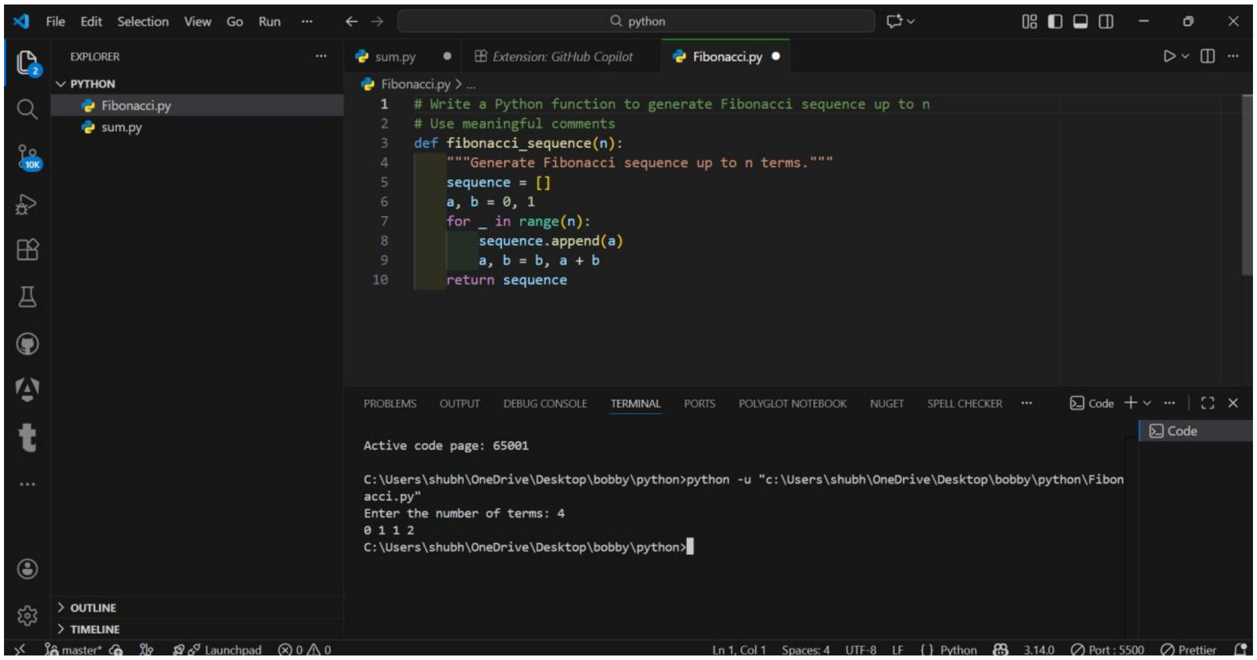


```python
# Optimize this Fibonacci code
# Simplify variable usage
n = int(input("Enter the number of terms: "))
a, b = 0, 1
for _ in range(n):
    print(a, end=' ')
    a, b = b, a + b
```

```
Active code page: 65001

C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 5
0 1 1 2 3
C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>
```

Task 3: Modular Design Using AI Assistance (Function-Based Fibonacci) :

# Write a Python function to generate Fibonacci sequence up to n
# Use meaningful comments



```python
# Write a Python function to generate Fibonacci sequence up to n
# Use meaningful comments
def fibonacci_sequence(n):
    """Generate Fibonacci sequence up to n terms."""
    sequence = []
    a, b = 0, 1
    for _ in range(n):
        sequence.append(a)
        a, b = b, a + b
    return sequence
```

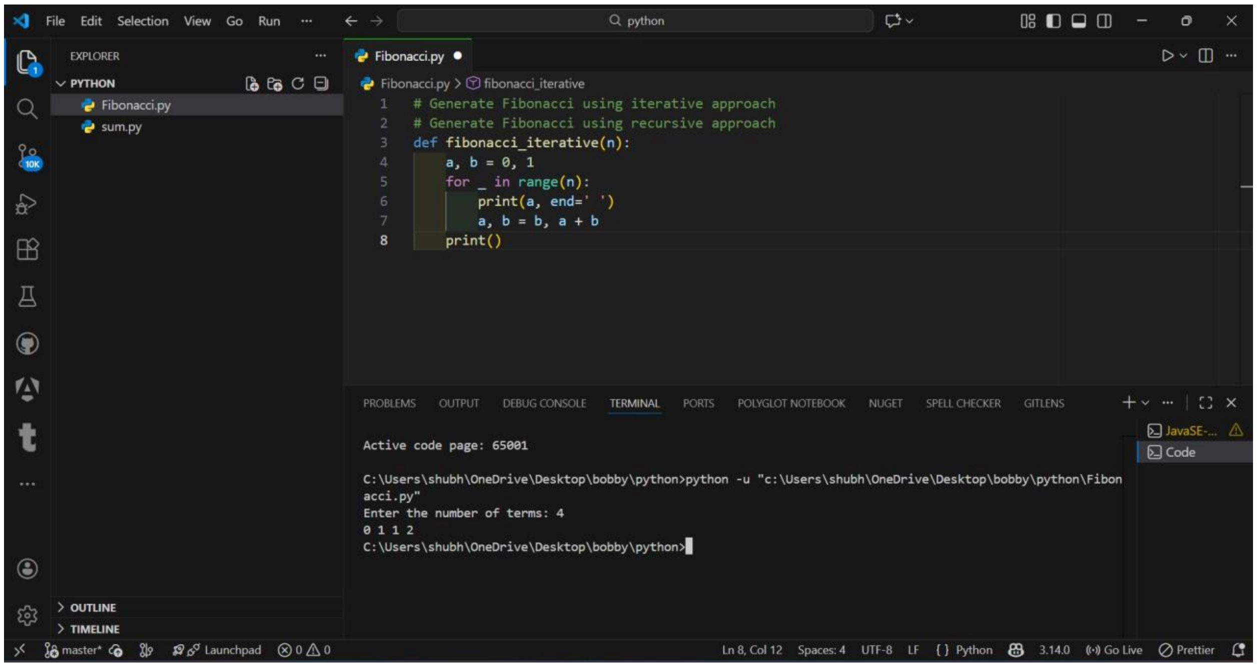
```
Active code page: 65001

C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>
```

Task 4: Comparative Analysis – Procedural vs Modular Code

Criteria	**Without Functions**	**With Functions**
Code Clarity	**Lower**	**Higher**
Reusability	**No**	**Yes**
Debugging	**Harder**	**Easier**
Scalability	**Poor**	**Excellent**
Suitable for Large Systems	**No**	**Yes**

Task 5: Iterative vs Recursive Fibonacci (AI-Generated):

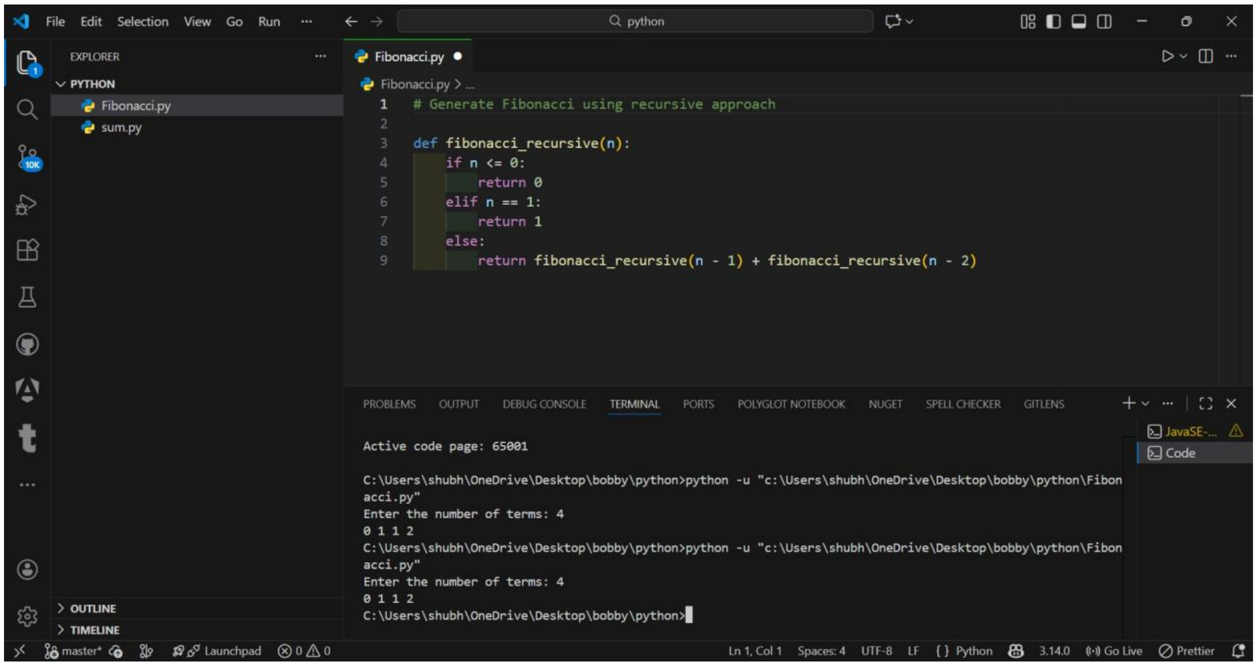
# Generate Fibonacci using iterative approach


File Edit Selection View Go Run ...
python
EXPLORER
PYTHON
Fibonacci.py
sum.py
OUTLINE
TIMELINE
Fibonacci.py > fibonacci_iterative
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POLYGLOT NOTEBOOK NUGET SPELL CHECKER GITLENS
JavaSE-...
Code
master* Launchpad 0 0
Ln 8, Col 12 Spaces: 4 UTF-8 LF {} Python 3.14.0 Go Live Prettier

```python
# Generate Fibonacci using iterative approach
# Generate Fibonacci using recursive approach
def fibonacci_iterative(n):
    a, b = 0, 1
    for _ in range(n):
        print(a, end=' ')
        a, b = b, a + b
    print()
```

```
Active code page: 65001

C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>
```

# Generate Fibonacci using recursive approach



```python
# Generate Fibonacci using recursive approach

def fibonacci_recursive(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        return fibonacci_recursive(n - 1) + fibonacci_recursive(n - 2)
```

```
Active code page: 65001

C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibon
acci.py"
Enter the number of terms: 4
0 1 1 2
C:\Users\shubh\OneDrive\Desktop\bobby\python>
```

File Edit Selection View Go Run
python
EXPLORER
PYTHON
Fibonacci.py
sum.py
Fibonacci.py > ...
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POLYGLOT NOTEBOOK NUGET SPELL CHECKER GITLENS
JavaSE-...
Code
OUTLINE
TIMELINE
master* Launchpad 0 0
Ln 1, Col 1 Spaces: 4 UTF-8 LF { } Python 3.14.0 Go Live Prettier