

Lab Assignment 1.3

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This screenshot shows the Visual Studio Code interface with the 'Python' extension page selected in the Extensions Marketplace. The left sidebar lists various extensions, including 'Code Runner', 'Python Debugger', 'Python', 'Pylance', 'Python Environments', 'Python Indent', and 'Python Extension'. The main panel displays the 'Python' extension by Microsoft, which has 198,510,521 installations and a 5-star rating. It provides details about the extension's features, installation instructions, and marketplace information. The right sidebar shows a chat window with a script for summing two numbers and a reusable function.

EXTENSIONS: MARKETPLACE

python

- Code Runner** 73ms
Run C, C++, Java, JS, PHP, Python, P...
Jun Han
- Python Debugger** 484ms
Python Debugger extension using d...
Microsoft
- Python** 495ms
Python language support with exte...
Microsoft
- Pylance** 1591ms
A performant, feature-rich languag...
Microsoft
- Python Environments** 136ms
Provides a unified python environm...
Microsoft
- Python Indent** 16.3M ★ 4
Correct Python indentation
Kevin Rose
- Python Extension ...** 12.8M ★ 4.5
Popular Visual Studio Code extensio...
Don Jayamanne
- Python for VSCode** 6.4M ★ 2
Popular Visual Studio Code extensio...
Don Jayamanne

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

Disable | Uninstall | Switch to Pre-Release Version | Auto Up

DETAILS FEATURES CHANGELOG EXTENSION PACK

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 **aihub.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

Categories

1) Script (reads two numbers from the user)

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

2) Function (reusable)

```
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.

Add Context...
Describe what to build next
Agent Auto

This screenshot shows the Visual Studio Code interface with the 'GitHub Copilot' extension page selected in the Extensions Marketplace. The left sidebar lists various extensions, including 'GitLens', 'GitHub Copilot', 'GitHub Copilot Chat', 'GitHub Pull Requests', 'Git Graph', 'Git History', 'Git Blame', and 'Git Extension Pack'. The main panel displays the 'GitHub Copilot' extension by GitHub, which has 66,427,573 installations and a 5-star rating. It provides details about the extension's features, installation instructions, and marketplace information. The right sidebar shows a chat window with a script for summing two numbers and a reusable function.

EXTENSIONS: MARKETPLACE

git

- GitLens — Git superchar...** 269ms
Supercharge Git within VS Code — ...
GitKraken
- GitHub Copilot**
Your AI pair programmer
GitHub
- GitHub Copilot Chat** 1393ms
AI chat features powered by Copilot
GitHub
- GitHub Pull Requests** 168ms
Pull Request and Issue Provider for ...
GitHub
- Git Graph** 13.1M ★ 5
View a Git Graph of your repository,...
mhutchie
- Git History** 15.6M ★ 4.5
View git log, file history, compare b...
Don Jayamanne
- Git Blame** 3.4M ★ 4.5
See git blame information in the sta...
Wade Anderson
- Git Extension Pack** 3.3M ★ 5
Popular Visual Studio Code extensio...
Don Jayamanne

GitHub Copilot
GitHub · github.com · 66,427,573 · ★★★★★ (1035)
Your AI pair programmer

Enable (Workspace) | Uninstall | Switch to Pre-Release Version | ✓

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.

DETAILS FEATURES EXTENSION PACK

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

1) Script (reads two numbers from the user)

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

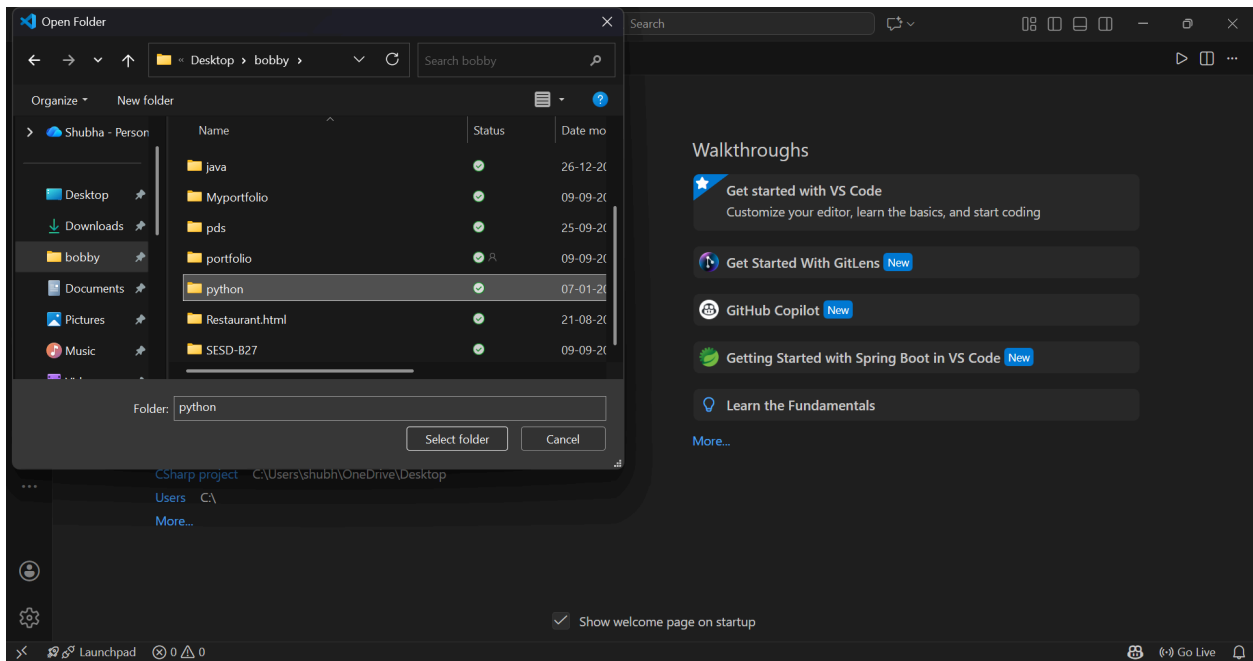
2) Function (reusable)

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

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

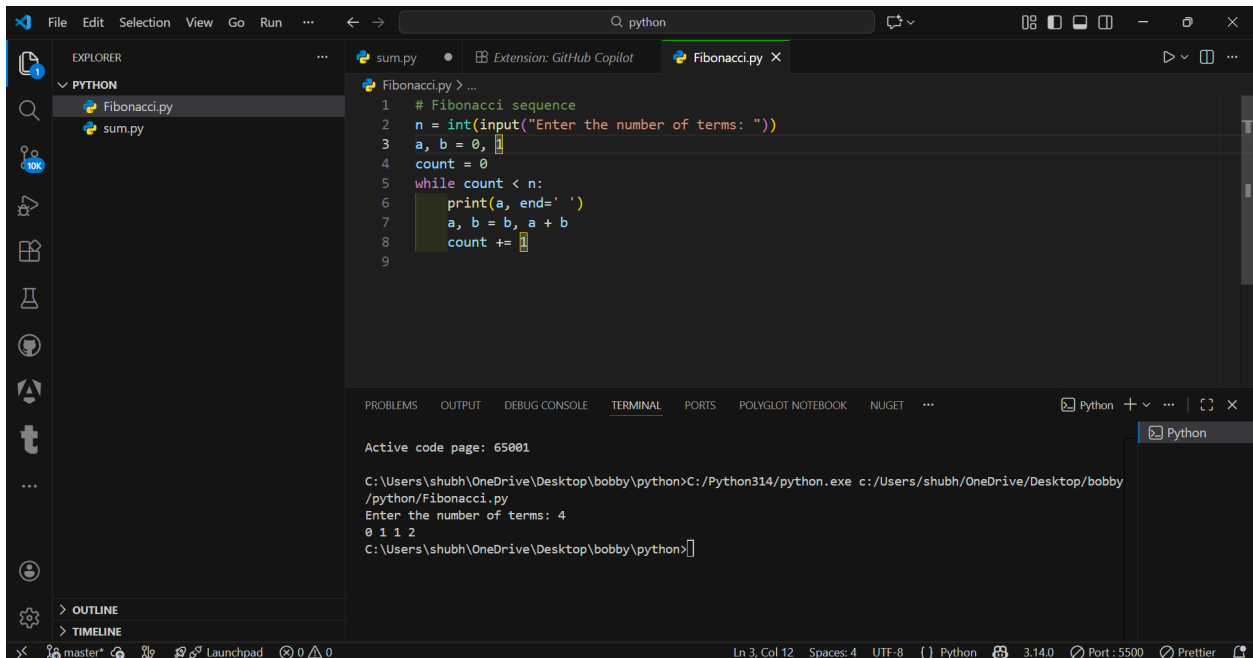
Note: use `int()` instead of `float()` if you only want integers.

Add Context...
Describe what to build next
Agent Auto



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

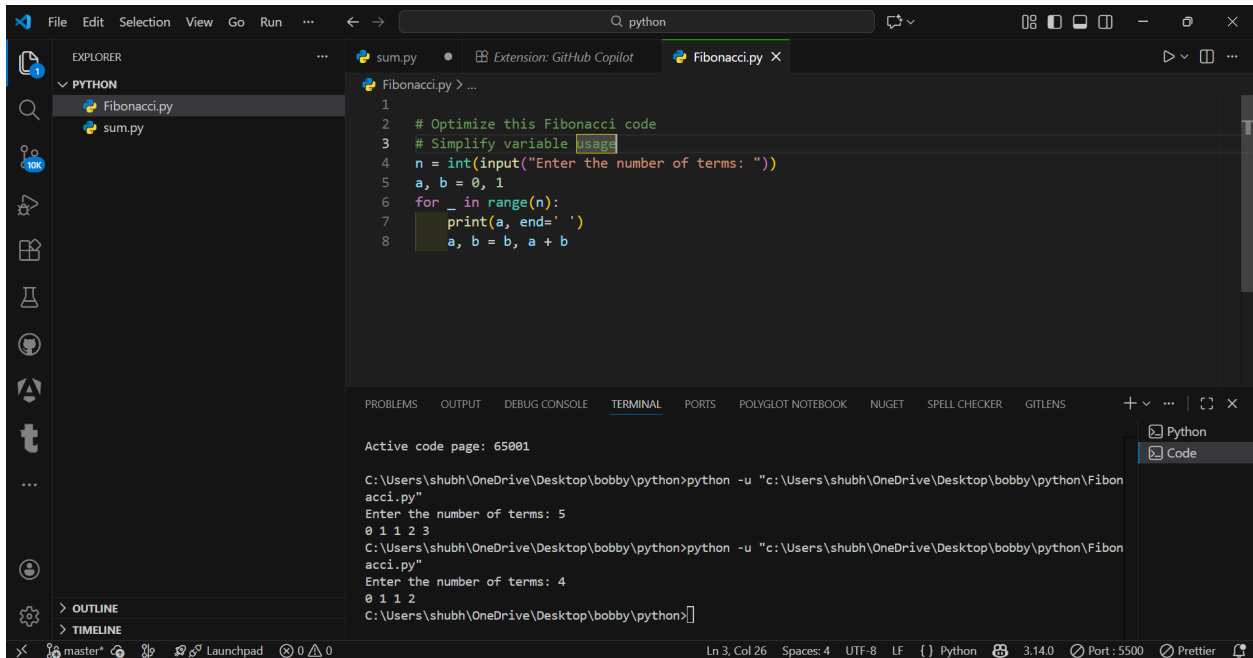
Fibonacci sequence



Task 2: AI Code Optimization & Cleanup :

Optimize this Fibonacci code

Simplify variable usage



The screenshot shows the VS Code editor with a file named `Fibonacci.py` open. The code in the editor is as follows:

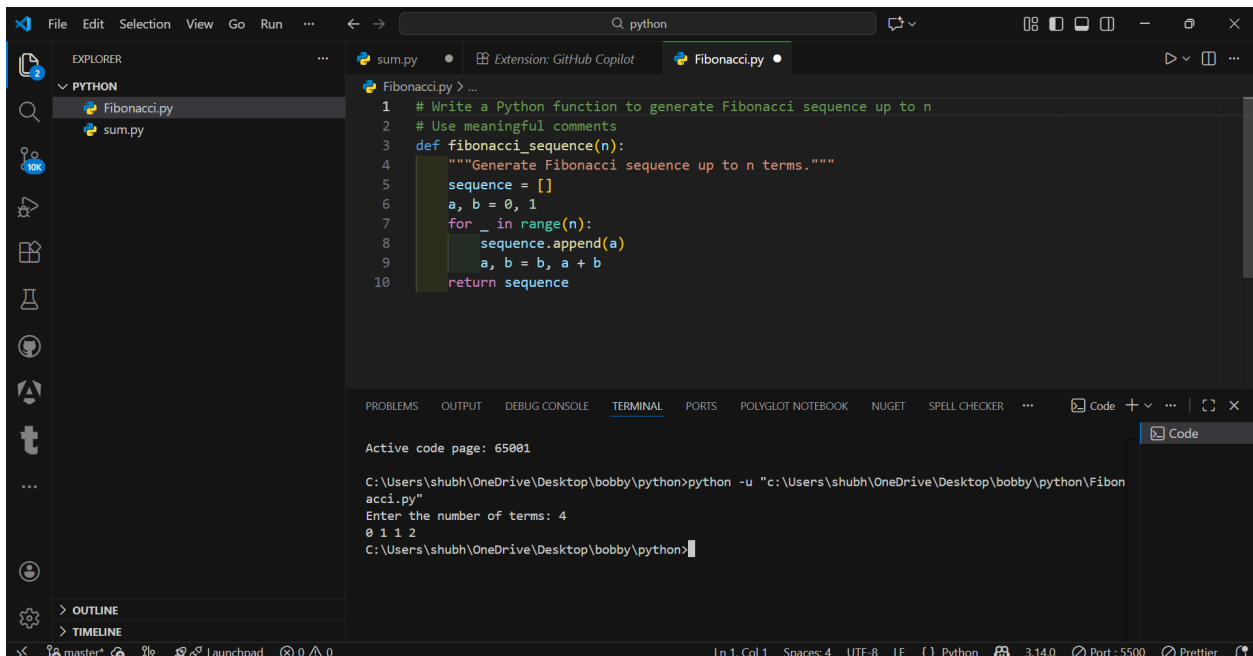
```
1
2 # Optimize this Fibonacci code
3 # Simplify variable usage
4 n = int(input("Enter the number of terms: "))
5 a, b = 0, 1
6 for _ in range(n):
7     print(a, end=' ')
8     a, b = b, a + b
```

The Explorer sidebar on the left shows the file structure with `Fibonacci.py` and `sum.py` under the `PYTHON` folder. The Terminal at the bottom shows the execution of the script for two different inputs: 5 and 4, resulting in the Fibonacci sequence: 0 1 1 2 3 and 0 1 1 2.

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

Write a Python function to generate Fibonacci sequence up to n

Use meaningful comments



The screenshot shows the VS Code editor with a file named `Fibonacci.py` open. The code in the editor is as follows:

```
1 # Write a Python function to generate Fibonacci sequence up to n
2 # Use meaningful comments
3 def fibonacci_sequence(n):
4     """Generate Fibonacci sequence up to n terms."""
5     sequence = []
6     a, b = 0, 1
7     for _ in range(n):
8         sequence.append(a)
9         a, b = b, a + b
10    return sequence
```

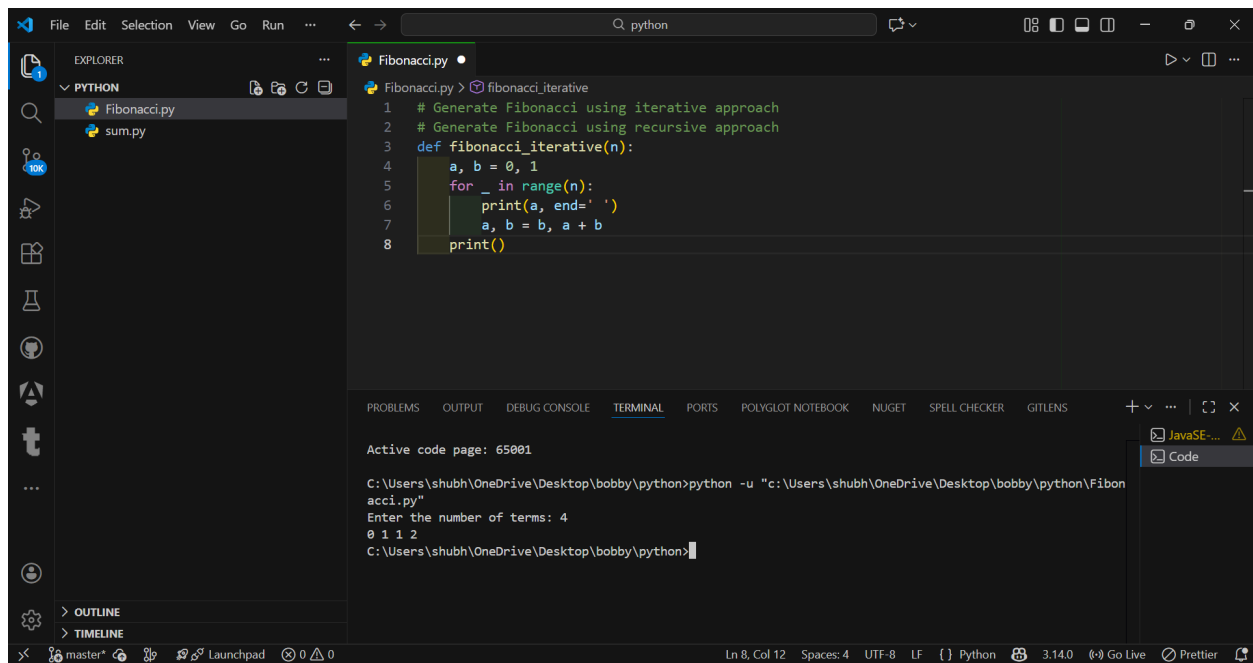
The Explorer sidebar on the left shows the file structure with `Fibonacci.py` and `sum.py` under the `PYTHON` folder. The Terminal at the bottom shows the execution of the script for an input of 4, resulting in the Fibonacci sequence: 0 1 1 2.

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



```
1 # Generate Fibonacci using iterative approach
2 # Generate Fibonacci using recursive approach
3 def fibonacci_iterative(n):
4     a, b = 0, 1
5     for _ in range(n):
6         print(a, end=' ')
7         a, b = b, a + b
8     print()
```

Active code page: 65901

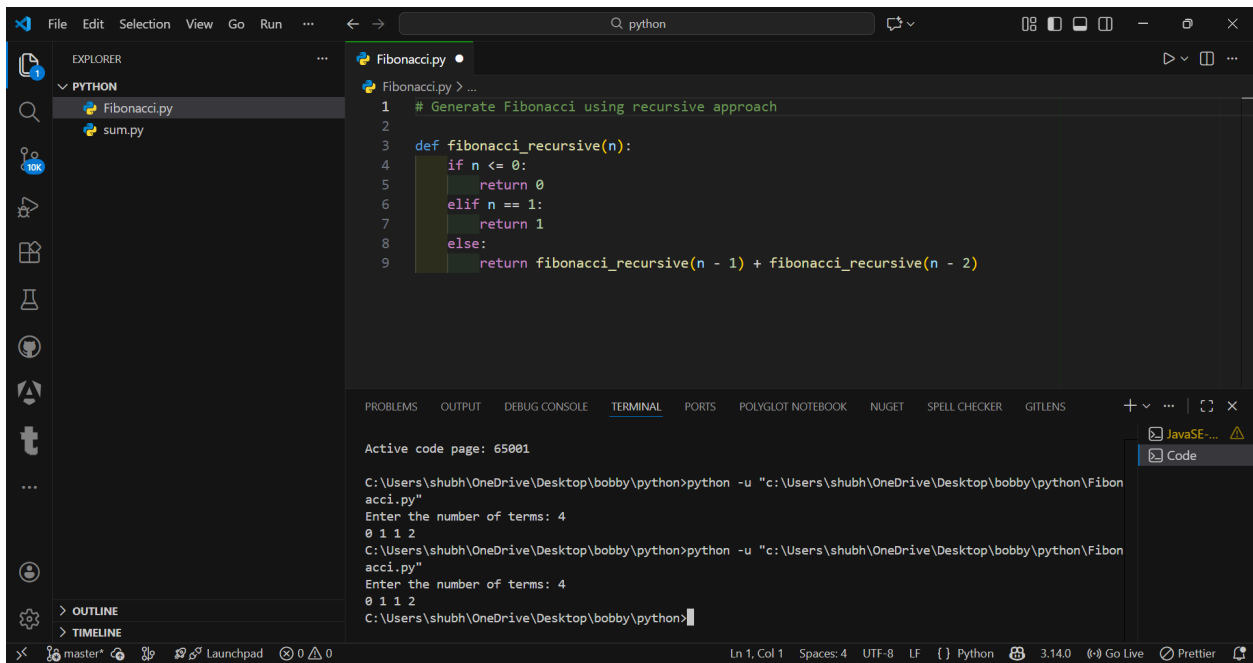
C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "c:\Users\shubh\OneDrive\Desktop\bobby\python\Fibonacci.py"

Enter the number of terms: 4

0 1 1 2

C:\Users\shubh\OneDrive\Desktop\bobby\python>

Generate Fibonacci using recursive approach



```
1 # Generate Fibonacci using recursive approach
2
3 def fibonacci_recursive(n):
4     if n <= 0:
5         return 0
6     elif n == 1:
7         return 1
8     else:
9         return fibonacci_recursive(n - 1) + fibonacci_recursive(n - 2)
```

Active code page: 65801

```
C:\Users\shubh\OneDrive\Desktop\bobby\python>python -u "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>python -u "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>
```