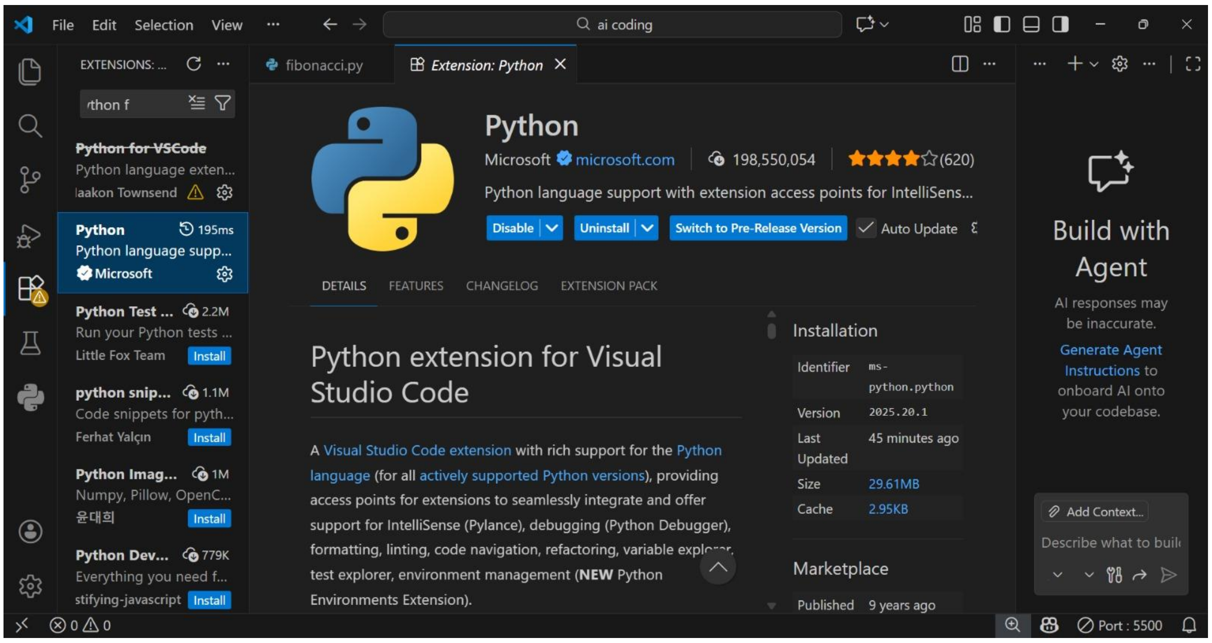
Course Title: AI-Assisted Coding

Batch – 06

Hall no. – 2303A51983

Question: Lab 1: Environment Setup – GitHub Copilot and VS Code Integration + Understanding AI-assisted Coding Workflow

Task 0 ● Install and configure GitHub Copilot in VS Code. Take screenshots of each step.



Python

Microsoft microsoft.com | 198,550,054 | ★★★★☆(620)

Python language support with extension access points for IntelliSens...

Python extension for Visual Studio Code

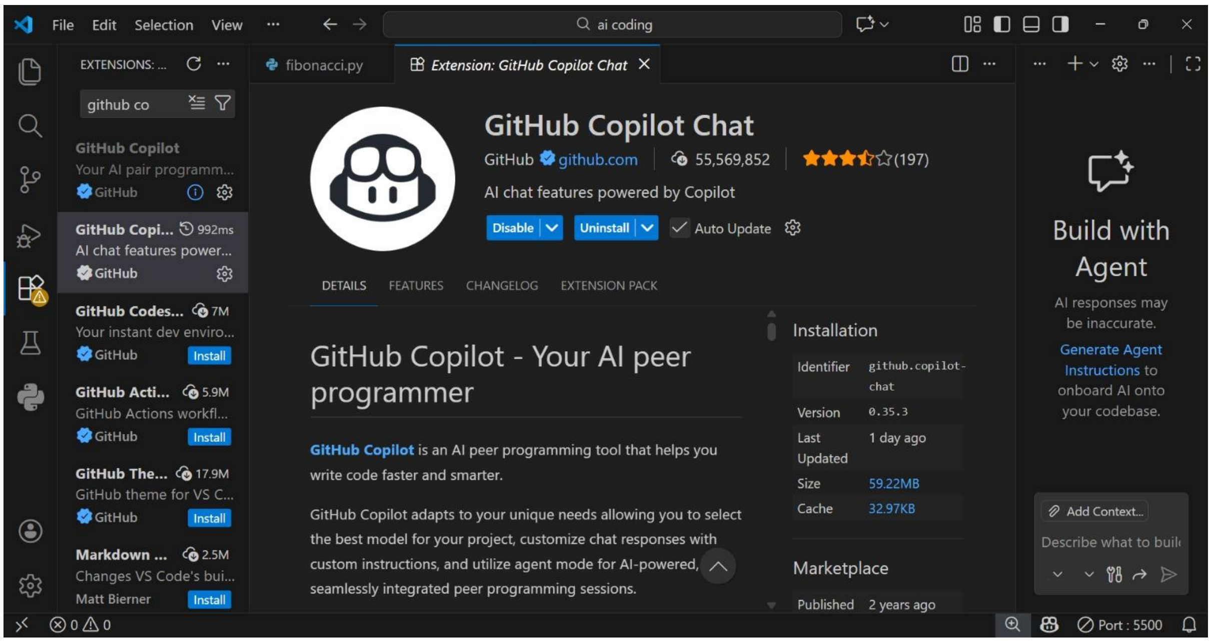
A Visual Studio Code extension with rich support for the Python language (for all actively supported Python versions), providing access points for extensions to seamlessly integrate and offer support for IntelliSense (Pylance), debugging (Python Debugger), formatting, linting, code navigation, refactoring,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

Installation

Identifier	ms-python.python
Version	2025.20.1
Last Updated	45 minutes ago
Size	29.61MB
Cache	2.95KB

Marketplace

Published 9 years ago



GitHub Copilot Chat

GitHub github.com | 55,569,852 | ★★★★☆(197)

AI chat features powered by Copilot

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.

Installation

Identifier	github.copilot-chat
Version	0.35.3
Last Updated	1 day ago
Size	59.22MB
Cache	32.97KB

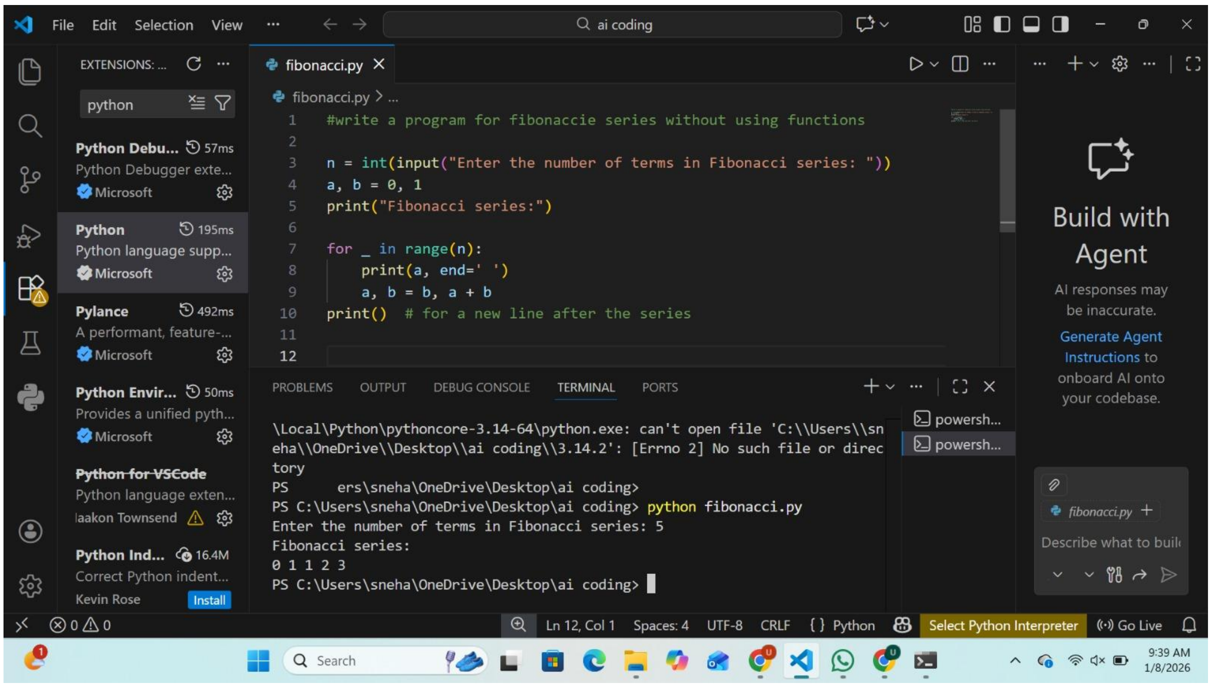
Marketplace

Published 2 years ago

Explanation: I installed GitHub Copilot in VS Code using the Extensions option. Then I signed in with my GitHub account and allowed permissions. Copilot started giving code suggestions while typing, which made coding easier.

Task 1: AI-Generated Logic Without Modularisation (Fibonacci Sequence Without Functions)

Input :



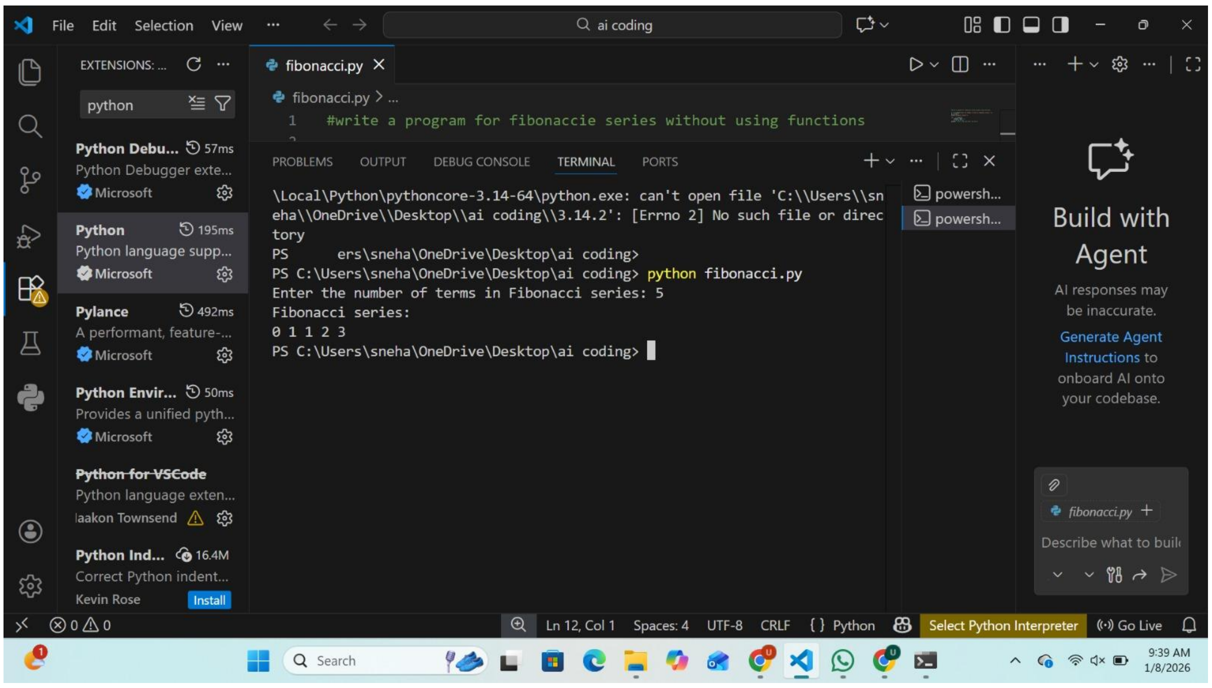
```python
#write a program for fibonaccie series without using functions

n = int(input("Enter the number of terms in Fibonacci series: "))
a, b = 0, 1
print("Fibonacci series:")

for _ in range(n):
    print(a, end=' ')
    a, b = b, a + b
print()  # for a new line after the series
```

```
\Local\Python\pythoncore-3.14-64\python.exe: can't open file 'C:\\Users\\sn
eha\\OneDrive\\Desktop\\ai coding\\3.14.2': [Errno 2] No such file or direc
tory
PS       ers\sneha\OneDrive\Desktop\ai coding>
PS C:\Users\sneha\OneDrive\Desktop\ai coding> python fibonacci.py
Enter the number of terms in Fibonacci series: 5
Fibonacci series:
0 1 1 2 3
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Output :



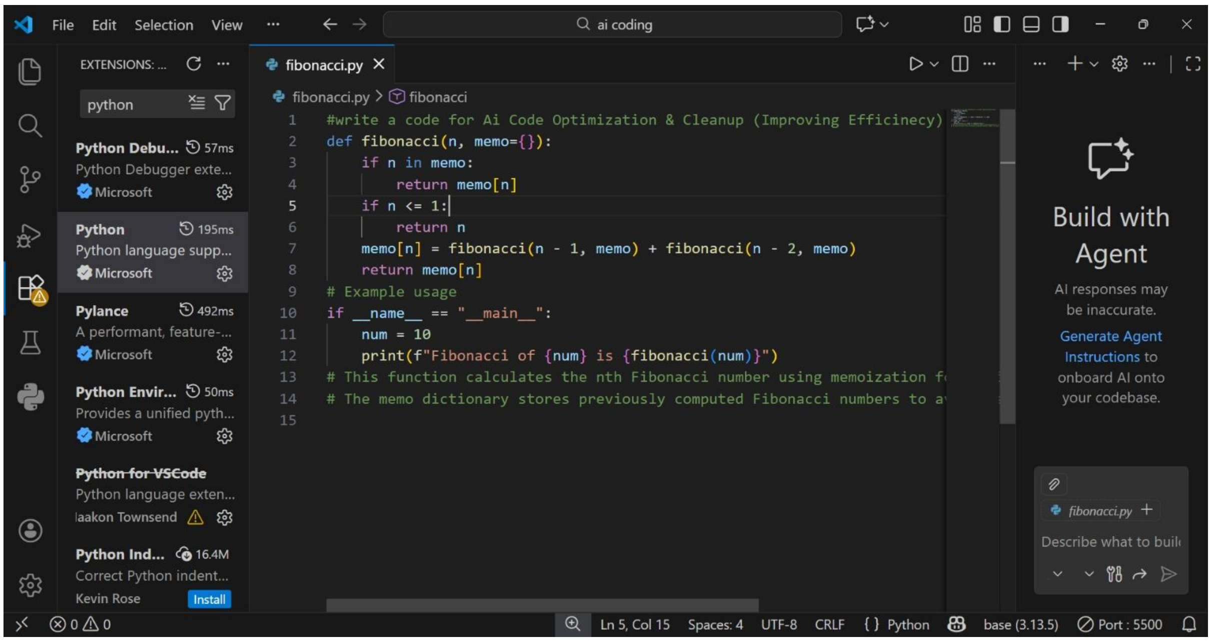
```python
#write a program for fibonaccie series without using functions
```

```
\Local\Python\pythoncore-3.14-64\python.exe: can't open file 'C:\\Users\\sn
eha\\OneDrive\\Desktop\\ai coding\\3.14.2': [Errno 2] No such file or direc
tory
PS       ers\sneha\OneDrive\Desktop\ai coding>
PS C:\Users\sneha\OneDrive\Desktop\ai coding> python fibonacci.py
Enter the number of terms in Fibonacci series: 5
Fibonacci series:
0 1 1 2 3
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Explanation: The Fibonacci code is written in one place. No functions are used in this program. The code works, but it looks messy.

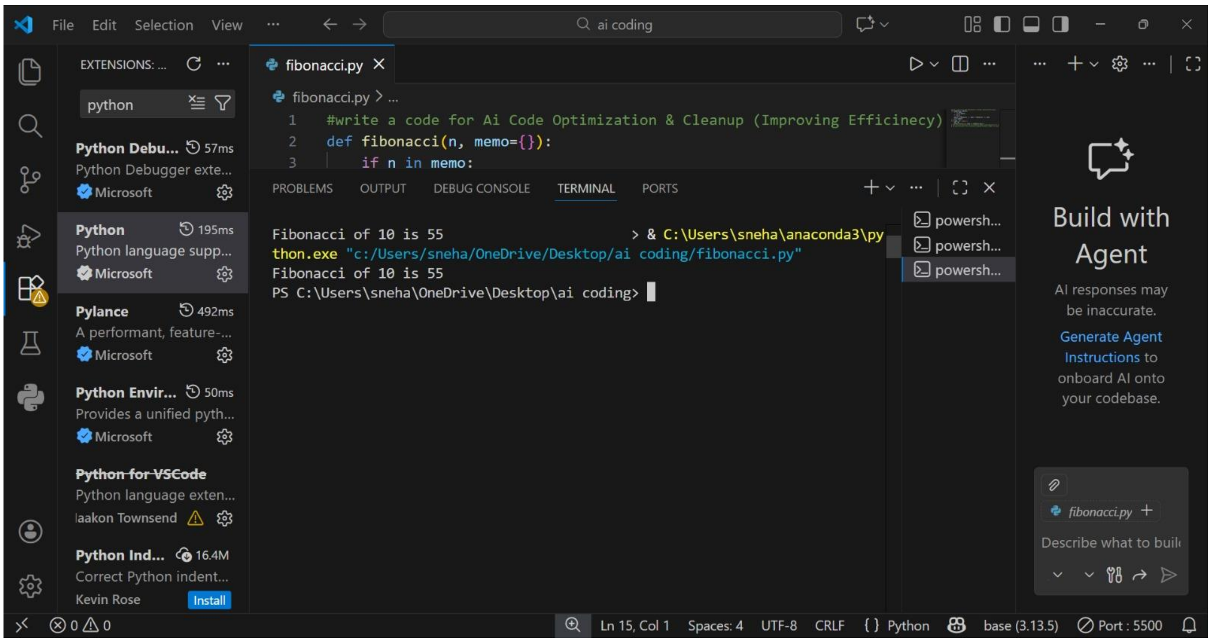
Task 2: AI-Code Optimisation & Cleanup (Improving Efficiency)

Input :



```python
#write a code for Ai Code Optimization & Cleanup (Improving Efficiency)
def fibonacci(n, memo={}):
    if n in memo:
        return memo[n]
    if n <= 1:
        return n
    memo[n] = fibonacci(n - 1, memo) + fibonacci(n - 2, memo)
    return memo[n]
# Example usage
if __name__ == "__main__":
    num = 10
    print(f"Fibonacci of {num} is {fibonacci(num)}")
# This function calculates the nth Fibonacci number using memoization f
# The memo dictionary stores previously computed Fibonacci numbers to a
```

Output :



```python
#write a code for Ai Code Optimization & Cleanup (Improving Efficiency)
def fibonacci(n, memo={}):
    if n in memo:
```

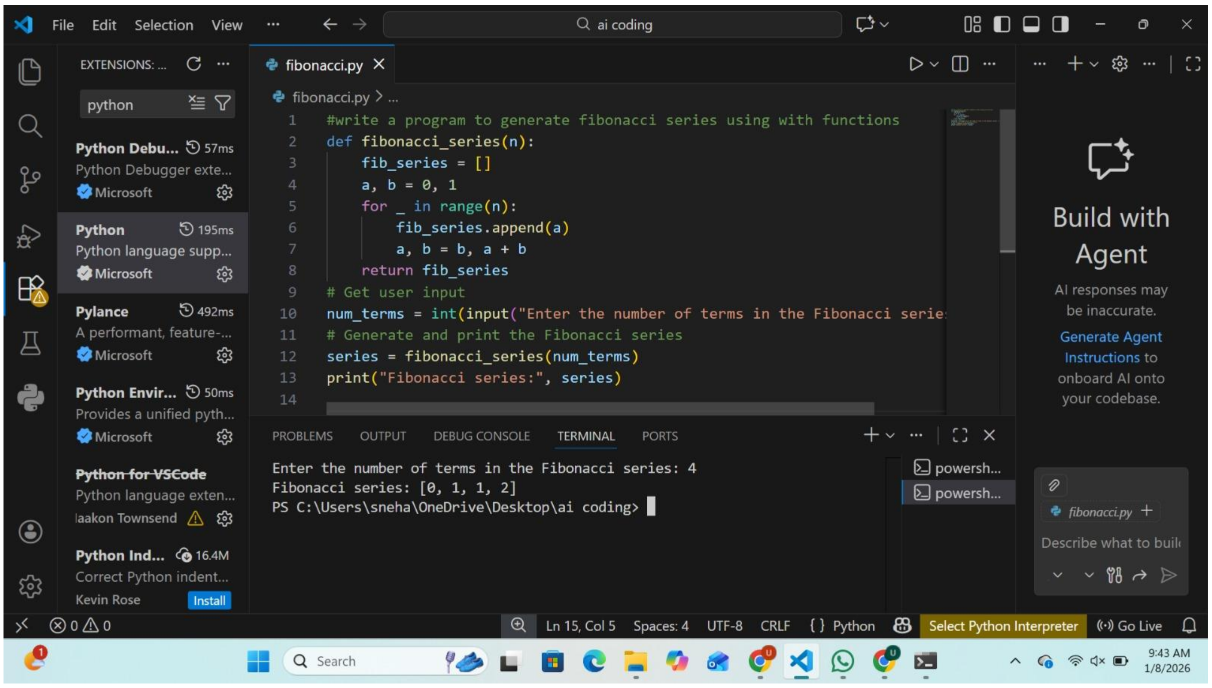
```
Fibonacci of 10 is 55                    > & C:\Users\sneha\anaconda3\py
thon.exe "c:/Users/sneha/OneDrive/Desktop/ai coding/fibonacci.py"
Fibonacci of 10 is 55
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Explanation : AI removed extra and useless code.The program became short and clean.

Now it is easy to understand.

Task 3: Modular Design Using AI Assistance (Fibonacci Using Functions)

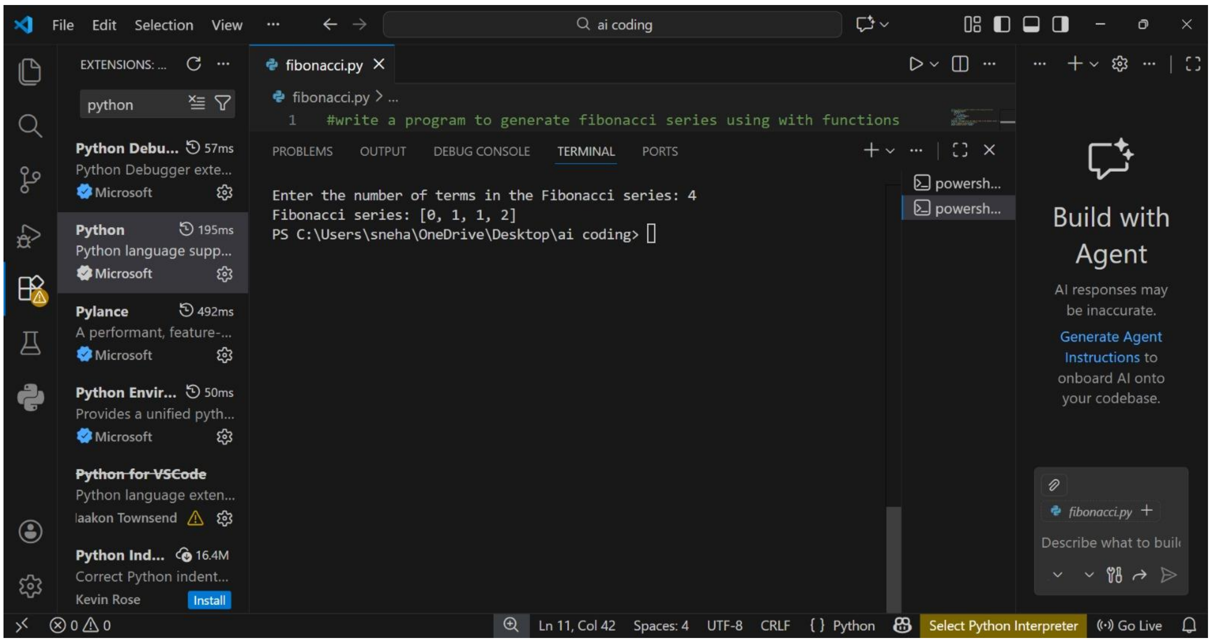
Input :



```python
#write a program to generate fibonacci series using with functions
def fibonacci_series(n):
    fib_series = []
    a, b = 0, 1
    for _ in range(n):
        fib_series.append(a)
        a, b = b, a + b
    return fib_series
# Get user input
num_terms = int(input("Enter the number of terms in the Fibonacci serie
# Generate and print the Fibonacci series
series = fibonacci_series(num_terms)
print("Fibonacci series:", series)
```

```
Enter the number of terms in the Fibonacci series: 4
Fibonacci series: [0, 1, 1, 2]
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Output :



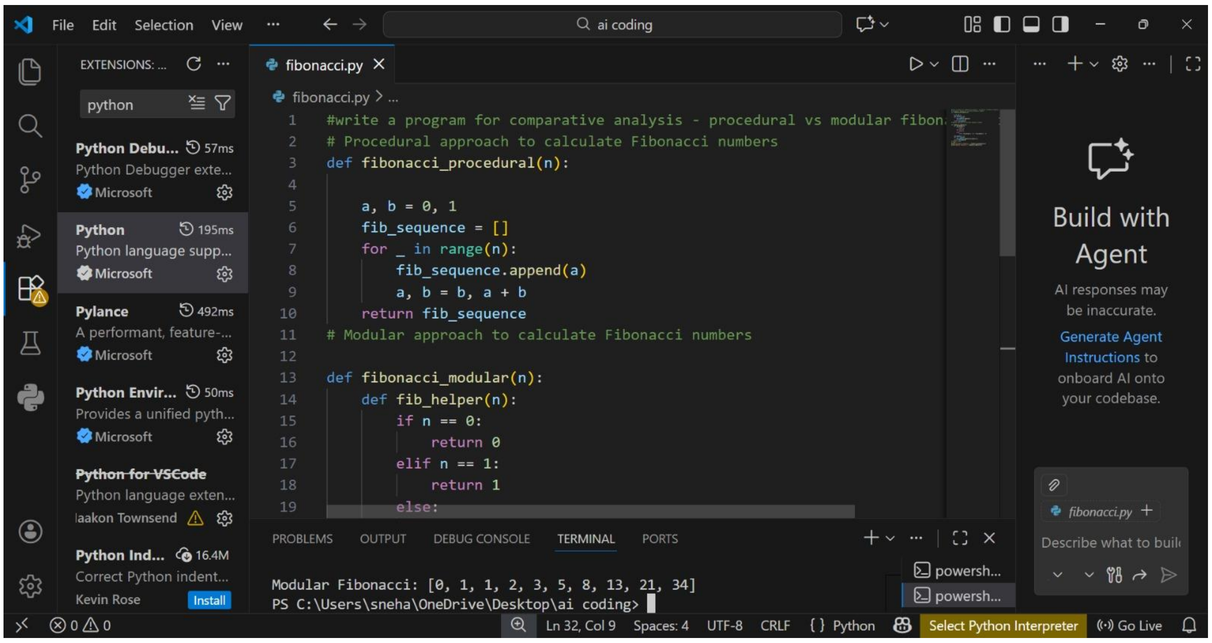
```
Enter the number of terms in the Fibonacci series: 4
Fibonacci series: [0, 1, 1, 2]
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Explanation : The code is written using a function.This makes the program neat.

The function can be reused.

Task 4: Comparative Analysis – Procedural vs Modular Fibonacci Code

Input :

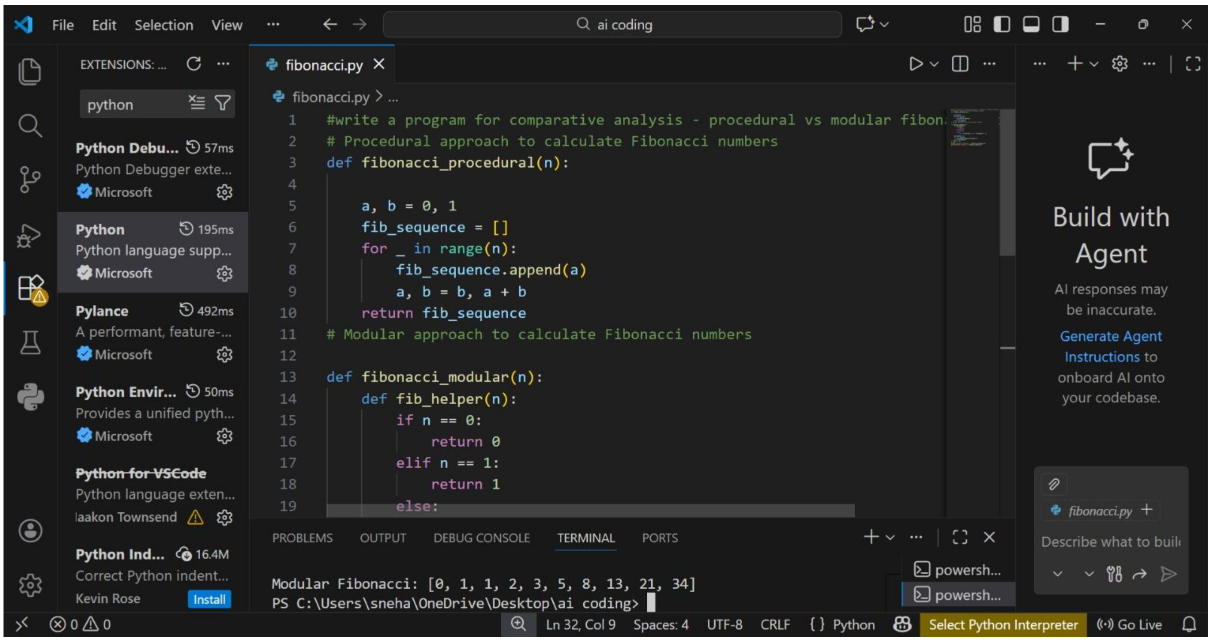


```python
#write a program for comparative analysis - procedural vs modular fibon
# Procedural approach to calculate Fibonacci numbers
def fibonacci_procedural(n):

    a, b = 0, 1
    fib_sequence = []
    for _ in range(n):
        fib_sequence.append(a)
        a, b = b, a + b
    return fib_sequence
# Modular approach to calculate Fibonacci numbers

def fibonacci_modular(n):
    def fib_helper(n):
        if n == 0:
            return 0
        elif n == 1:
            return 1
        else:
```

```
Modular Fibonacci: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```



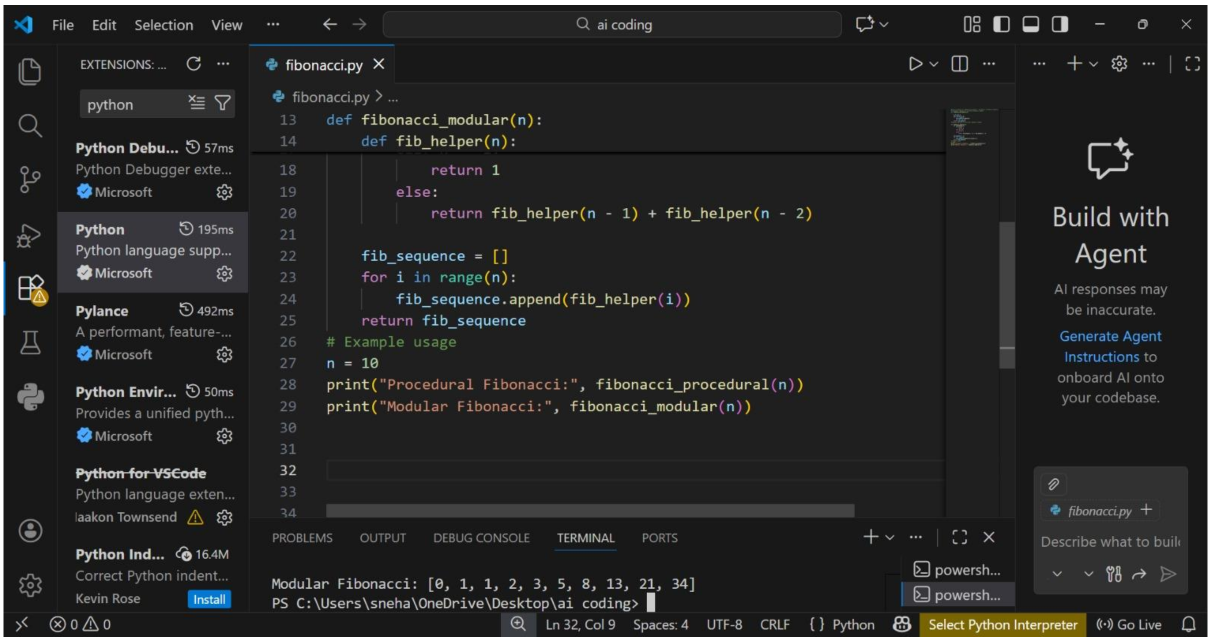
```python
#write a program for comparative analysis - procedural vs modular fibon
# Procedural approach to calculate Fibonacci numbers
def fibonacci_procedural(n):

    a, b = 0, 1
    fib_sequence = []
    for _ in range(n):
        fib_sequence.append(a)
        a, b = b, a + b
    return fib_sequence
# Modular approach to calculate Fibonacci numbers

def fibonacci_modular(n):
    def fib_helper(n):
        if n == 0:
            return 0
        elif n == 1:
            return 1
        else:
```

```
Modular Fibonacci: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Output :



```python
def fibonacci_modular(n):
    def fib_helper(n):
            return 1
        else:
            return fib_helper(n - 1) + fib_helper(n - 2)

    fib_sequence = []
    for i in range(n):
        fib_sequence.append(fib_helper(i))
    return fib_sequence
# Example usage
n = 10
print("Procedural Fibonacci:", fibonacci_procedural(n))
print("Modular Fibonacci:", fibonacci_modular(n))
```

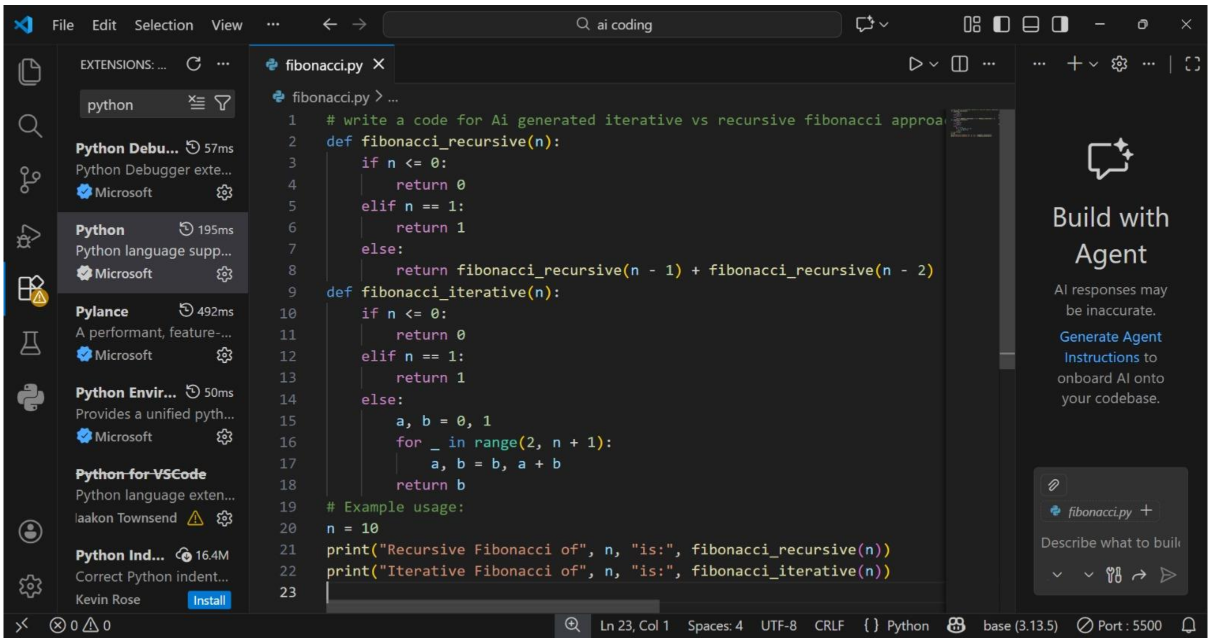
```
Modular Fibonacci: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
PS C:\Users\sneha\OneDrive\Desktop\ai coding>
```

Explantion ; Procedural code is written in one block.Modular code uses functions.

Modular code is better and clearer.

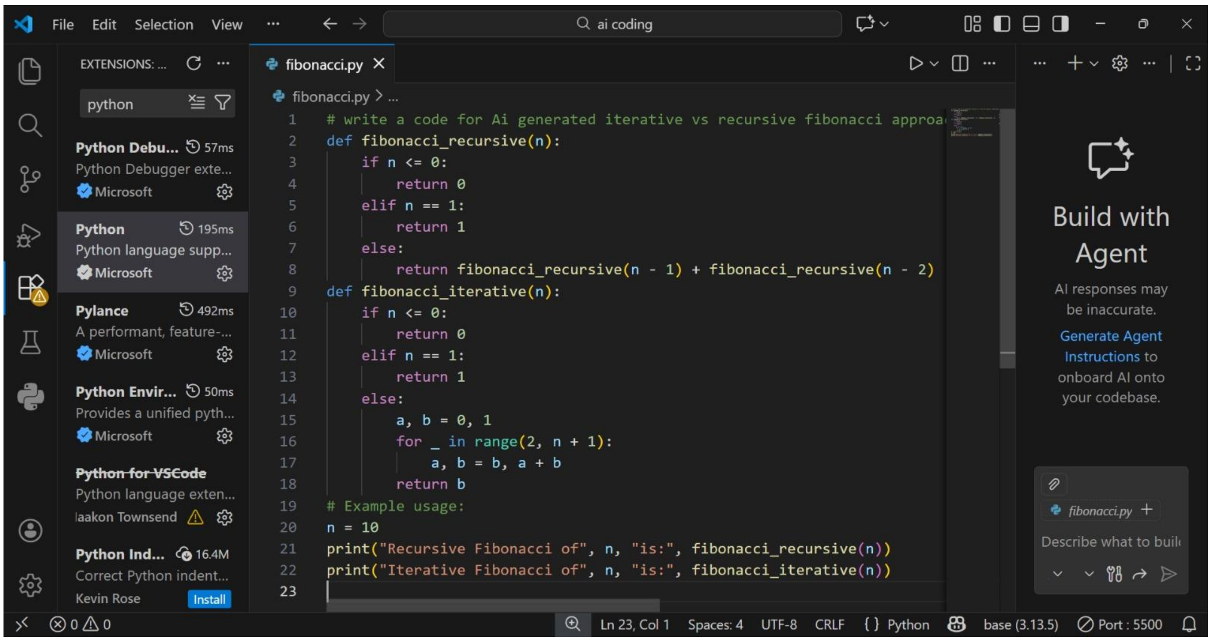
Task 5: AI-Generated Iterative vs Recursive Fibonacci Approaches (Different Algorithmic Approaches for Fibonacci Series)

Input :



```python
# write a code for Ai generated iterative vs recursive fibonacci approa
def fibonacci_recursive(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        return fibonacci_recursive(n - 1) + fibonacci_recursive(n - 2)
def fibonacci_iterative(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        a, b = 0, 1
        for _ in range(2, n + 1):
            a, b = b, a + b
        return b
# Example usage:
n = 10
print("Recursive Fibonacci of", n, "is:", fibonacci_recursive(n))
print("Iterative Fibonacci of", n, "is:", fibonacci_iterative(n))
```

Output :



```python
# write a code for Ai generated iterative vs recursive fibonacci approa
def fibonacci_recursive(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        return fibonacci_recursive(n - 1) + fibonacci_recursive(n - 2)
def fibonacci_iterative(n):
    if n <= 0:
        return 0
    elif n == 1:
        return 1
    else:
        a, b = 0, 1
        for _ in range(2, n + 1):
            a, b = b, a + b
        return b
# Example usage:
n = 10
print("Recursive Fibonacci of", n, "is:", fibonacci_recursive(n))
print("Iterative Fibonacci of", n, "is:", fibonacci_iterative(n))
```

File Edit Selection View
ai coding
EXTENSIONS: ...
python
Python Debu... 57ms Python Debugger exte... Microsoft
Python 195ms Python language supp... Microsoft
Pylance 492ms A performant, feature-... Microsoft
Python Envir... 50ms Provides a unified pyth... Microsoft
~~Python for VSCode~~ Python language exten... Thomas Haakon Townsend
Python Ind... 16.4M Correct Python indent... Kevin Rose Install
fibonacci.py
Build with Agent
AI responses may be inaccurate.
Generate Agent Instructions to onboard AI onto your codebase.
Describe what to buil
Ln 23, Col 1 Spaces: 4 UTF-8 CRLF { } Python base (3.13.5) Port : 5500

Explanation :

Iterative method uses a loop. Recursive method calls itself. The loop method is faster.