

Amruth Sagar

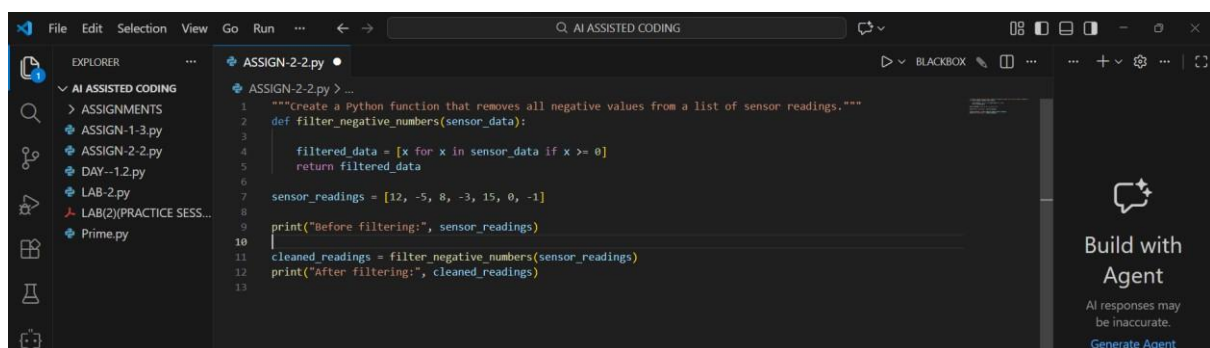
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## ASSIGNMENT -2.2

### Task 1: Cleaning Sensor Data

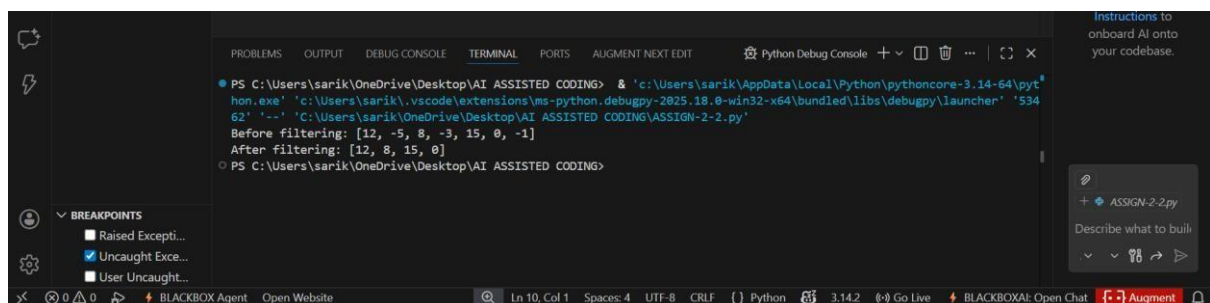
**PROMPT:** Create a Python function that removes all negative values from a list of sensor readings.



The screenshot shows the VS Code editor with a file named 'ASSIGN-2-2.py'. The code defines a function 'filter\_negative\_numbers' that takes a list of sensor readings and returns a new list with only non-negative values. The function uses list comprehension: `filtered_data = [x for x in sensor_data if x >= 0]`. The main code block initializes `sensor_readings = [12, -5, 8, -3, 15, 0, -1]`, prints the list before filtering, calls the function, and prints the cleaned list.

```
1 """create a Python function that removes all negative values from a list of sensor readings."""
2 def filter_negative_numbers(sensor_data):
3     filtered_data = [x for x in sensor_data if x >= 0]
4     return filtered_data
5
6 sensor_readings = [12, -5, 8, -3, 15, 0, -1]
7
8 print("Before filtering:", sensor_readings)
9
10 cleaned_readings = filter_negative_numbers(sensor_readings)
11 print("After filtering:", cleaned_readings)
12
13
```

**OUTPUT:**



The screenshot shows the VS Code terminal window with the output of the Python code. The output displays the original list of sensor readings and the cleaned list after removing negative values.

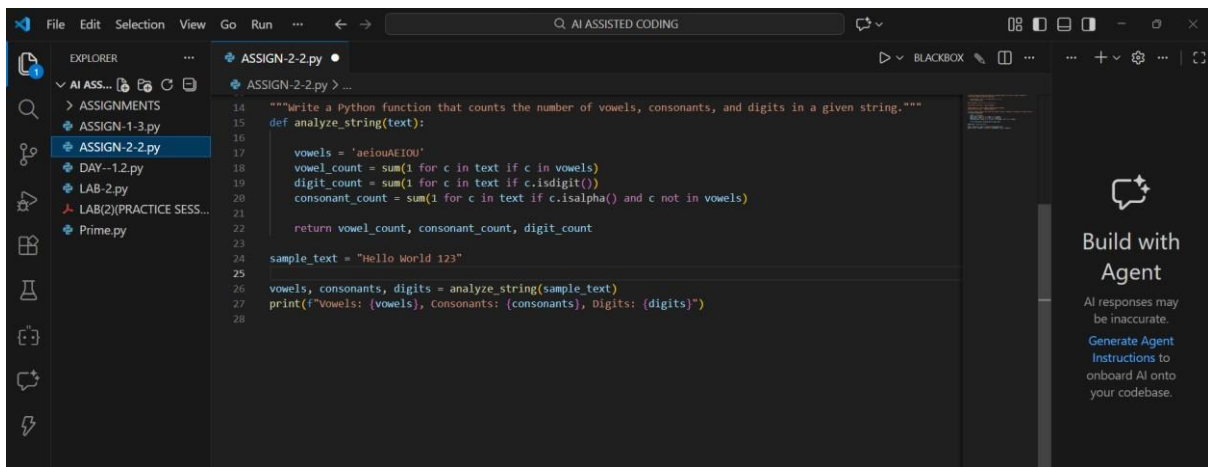
```
PS C:\Users\sarik\OneDrive\Desktop\AI ASSISTED CODING> & 'c:\Users\sarik\AppData\Local\Python\pythoncore-3.14-64\python.exe' 'c:\Users\sarik\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '53462' '--' 'C:\Users\sarik\OneDrive\Desktop\AI ASSISTED CODING\ASSIGN-2-2.py'
Before filtering: [12, -5, 8, -3, 15, 0, -1]
After filtering: [12, 8, 15, 0]
PS C:\Users\sarik\OneDrive\Desktop\AI ASSISTED CODING>
```

**EXPLANATION:**

This function removes invalid negative sensor values using list comprehension. Only values greater than or equal to zero are retained, ensuring clean IoT sensor data.

### Task 2: String Character Analysis

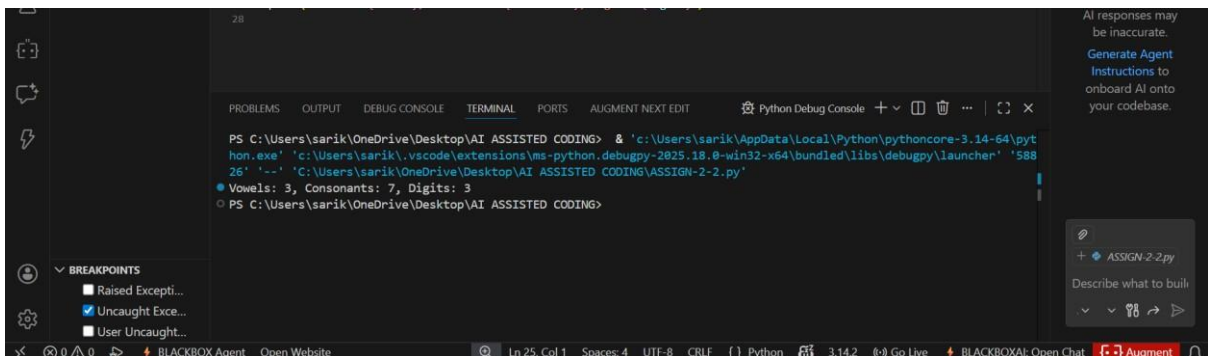
**PROMPT:** Write a Python function that counts the number of vowels, consonants, and digits in a given string.



The screenshot shows a VS Code editor with a file named 'ASSIGN-2-2.py'. The code defines a function 'analyze\_string(text)' that counts vowels, consonants, and digits in a given string. The function uses string methods 'isalpha()' and 'isdigit()' to classify characters. A sample string 'Hello World 123' is used to test the function, and the results are printed as a dictionary: {'Vowels': 3, 'Consonants': 7, 'Digits': 3}.

```
14 """Write a Python function that counts the number of vowels, consonants, and digits in a given string."""
15 def analyze_string(text):
16
17     vowels = 'aeiouAEIOU'
18     vowel_count = sum(1 for c in text if c in vowels)
19     digit_count = sum(1 for c in text if c.isdigit())
20     consonant_count = sum(1 for c in text if c.isalpha() and c not in vowels)
21
22     return vowel_count, consonant_count, digit_count
23
24 sample_text = "Hello World 123"
25
26 vowels, consonants, digits = analyze_string(sample_text)
27 print(f"Vowels: {vowels}, Consonants: {consonants}, Digits: {digits}")
28
```

**OUTPUT:**



The screenshot shows the terminal output of the Python script. The command executed is 'python ASSIGN-2-2.py', and the output is 'Vowels: 3, Consonants: 7, Digits: 3'.

```
PS C:\Users\sarik\OneDrive\Desktop\AI ASSISTED CODING> python ASSIGN-2-2.py
Vowels: 3, Consonants: 7, Digits: 3
PS C:\Users\sarik\OneDrive\Desktop\AI ASSISTED CODING>
```

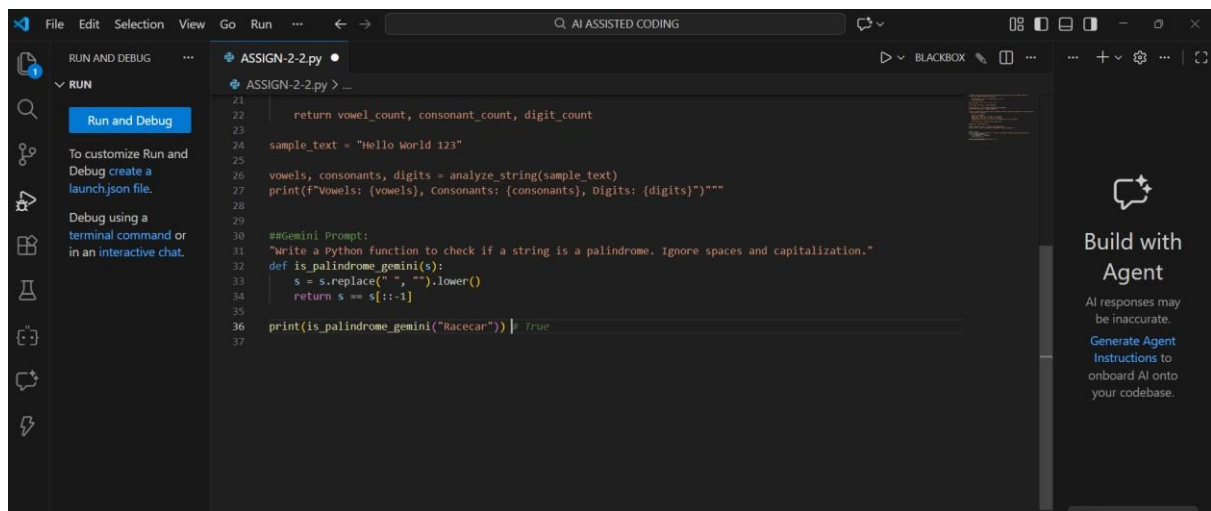
**EXPLANATION:**

The function iterates through each character and classifies it as a vowel, consonant, or digit.

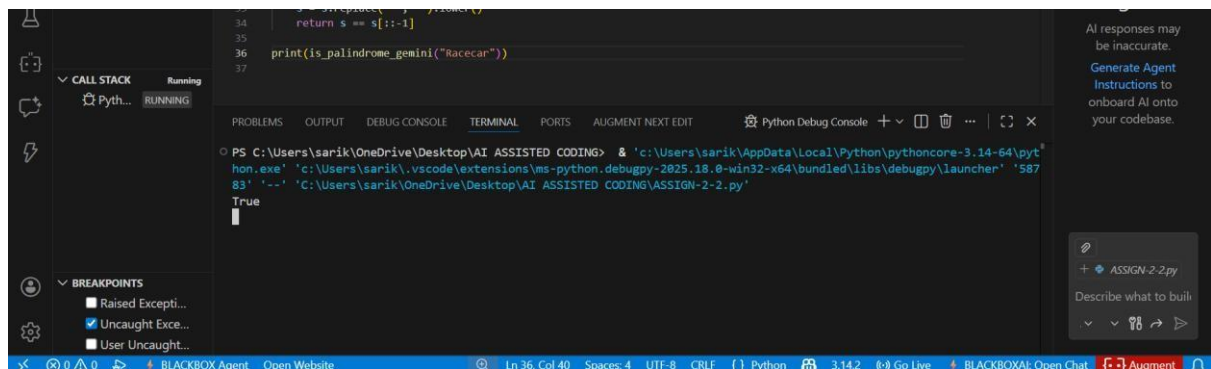
Python string methods like 'isalpha()' and 'isdigit()' improve accuracy and readability.

### Task 3: Palindrome Check – Tool Comparison

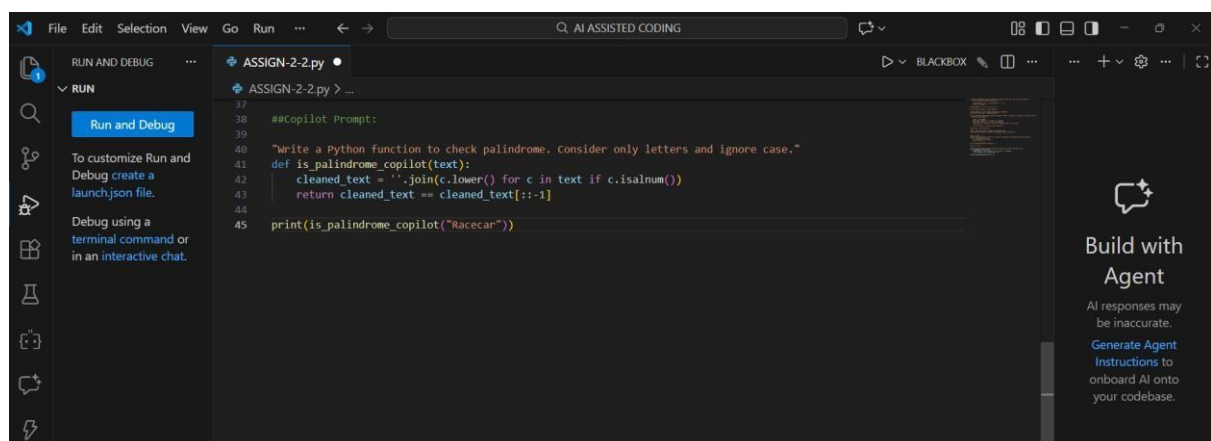
**Gemini Prompt:** Write a Python function to check if a string is a palindrome. Ignore spaces and capitalization.



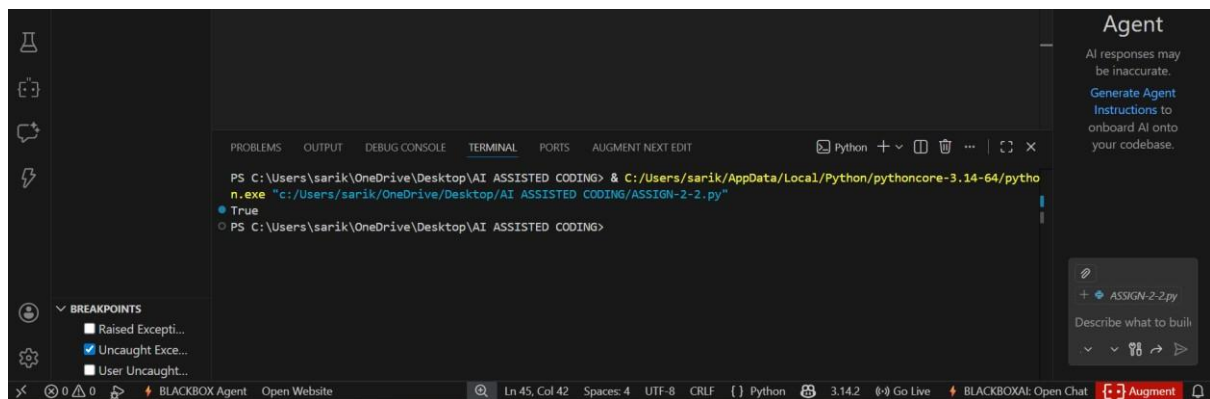
OUTPUT:



**Copilot Prompt:** Write a Python function to check palindrome. Consider only letters and ignore case.



OUTPUT:



## Comparison Table:

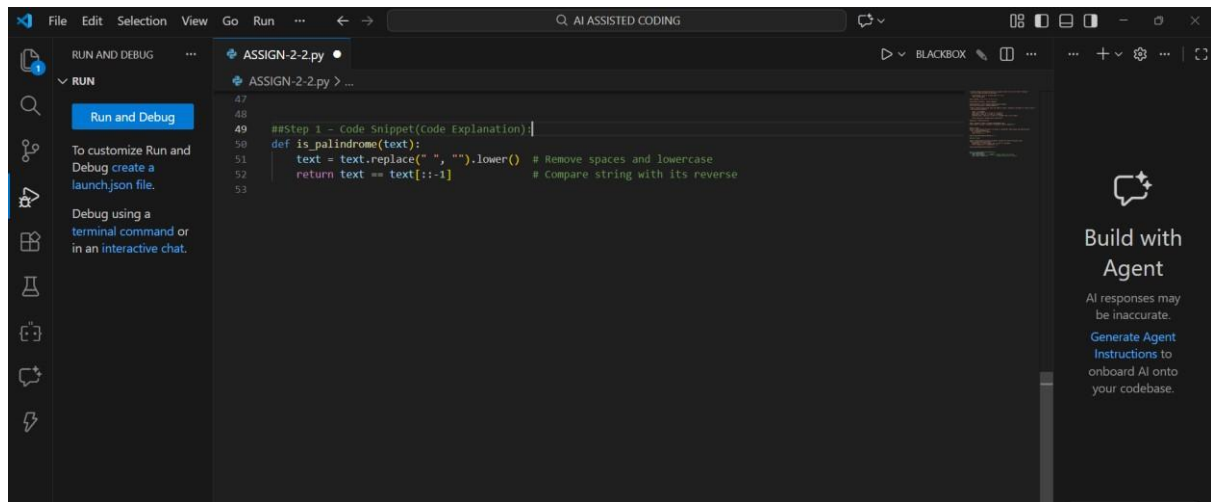
| Feature              | Gemini                                | Copilot                                   |
|----------------------|---------------------------------------|---|
| Clarity              | Simple, minimal code                  | Slightly longer, more robust              |
| Handling spaces/case | Ignores spaces, converts to lowercase | Ignores spaces and punctuation, lowercase |
| Readability          | Very clear                            | Clear, slightly more detailed             |
| Efficiency           | Uses string slicing                   | Uses string comprehension                 |

## EXPLANATION:

Gemini provides concise and easy-to-read logic, making it beginnerfriendly. Copilot generates more robust code that handles punctuation and special characters.

## Task 4: Code Explanation Using AI Step 1 –

### Code Snippet:



## Step 2 – AI Explanation:

1. `text.replace(" ", "").lower()` → Removes spaces and converts letters to lowercase.
2. `text == text[::-1]` → Checks if the string is equal to its reverse.

## EXPLANATION:

The function normalizes the string to avoid case and space mismatches. It then compares the string with its reverse to verify palindrome logic.