

## Assignment – 2.2

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Batch - 03

AI Assisted Coding

13-01-2026

### Task 1: Cleaning Sensor Data

#### ❖ Scenario:

❖ You are cleaning IoT sensor data where negative values are invalid.

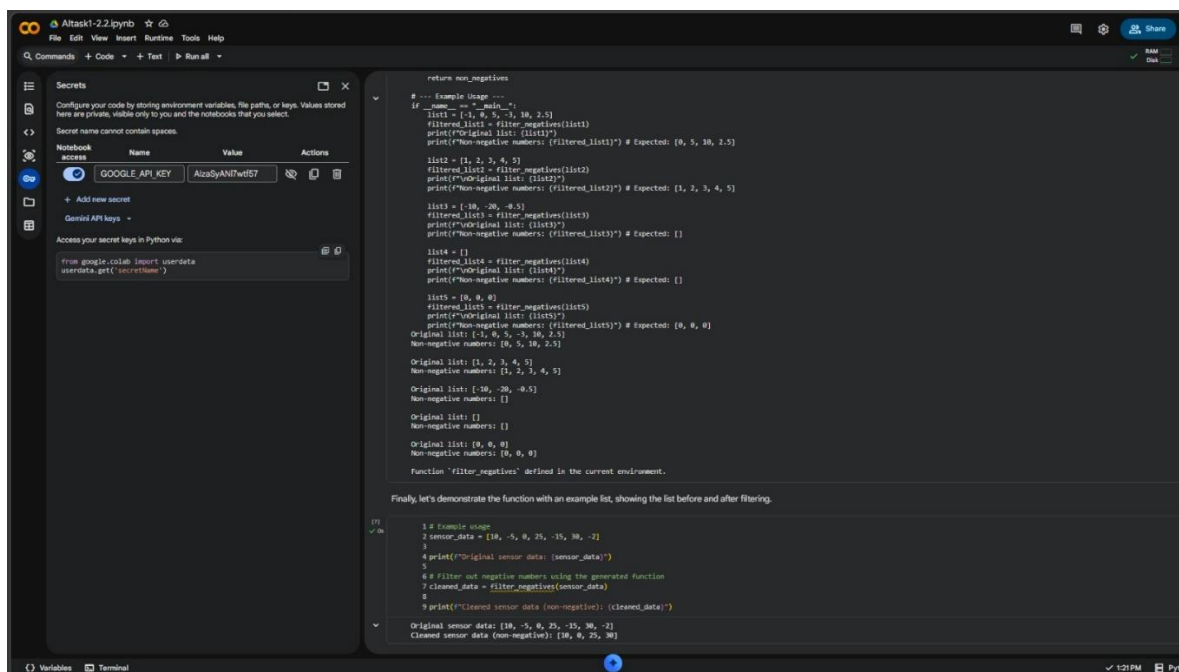
#### ❖ Task:

Use Gemini in Colab to generate a function that filters out all negative numbers from a list.

#### ❖ Expected Output:

➤ Before/after list

➤ Screenshot of Colab execution



The screenshot shows a Google Colab notebook titled "AltTask1-2.2.py". The left sidebar contains a "Secrets" panel with a secret named "GOOGLE\_API\_KEY" and a "Notebook access" section. The main editor area displays a Python function named "return\_non\_negatives" that filters out negative numbers from a list. The function is tested with several example lists, and the output shows the original list, the filtered list, and the non-negative numbers. The bottom of the notebook shows the execution of the function with a sample sensor data list, resulting in a cleaned list of non-negative values.

```
def return_non_negatives(list1):  
    # --- Example Usage ---  
    if __name__ == "__main__":  
        list1 = [-1, 0, 5, -1, 10, 2.5]  
        filtered_list1 = filter_negatives(list1)  
        print(f"Original list: {list1}")  
        print(f"Non-negative numbers: {filtered_list1}") # Expected: [0, 5, 10, 2.5]  
  
        list2 = [1, 2, 3, 4, 5]  
        filtered_list2 = filter_negatives(list2)  
        print(f"Original list: {list2}")  
        print(f"Non-negative numbers: {filtered_list2}") # Expected: [1, 2, 3, 4, 5]  
  
        list3 = [-10, -20, -0.5]  
        filtered_list3 = filter_negatives(list3)  
        print(f"Original list: {list3}")  
        print(f"Non-negative numbers: {filtered_list3}") # Expected: []  
  
        list4 = []  
        filtered_list4 = filter_negatives(list4)  
        print(f"Original list: {list4}")  
        print(f"Non-negative numbers: {filtered_list4}") # Expected: []  
  
        list5 = [0, 0, 0]  
        filtered_list5 = filter_negatives(list5)  
        print(f"Original list: {list5}")  
        print(f"Non-negative numbers: {filtered_list5}") # Expected: [0, 0, 0]  
  
        Original list: [-1, 0, 5, -1, 10, 2.5]  
        Non-negative numbers: [0, 5, 10, 2.5]  
  
        Original list: [1, 2, 3, 4, 5]  
        Non-negative numbers: [1, 2, 3, 4, 5]  
  
        Original list: [-10, -20, -0.5]  
        Non-negative numbers: []  
  
        Original list: []  
        Non-negative numbers: []  
  
        Original list: [0, 0, 0]  
        Non-negative numbers: [0, 0, 0]  
  
        Function "filter_negatives" defined in the current environment.  
  
        Finally, let's demonstrate the function with an example list, showing the list before and after filtering.  
  
        1 # Example usage  
        2 sensor_data = [10, -5, 0, 25, -15, 30, -2]  
        3  
        4 print(f"Original sensor data: {sensor_data}")  
        5  
        6 # Filter out negative numbers using the generated function  
        7 cleaned_data = filter_negatives(sensor_data)  
        8  
        9 print(f"Cleaned sensor data (non-negative): {cleaned_data}")  
  
        Original sensor data: [10, -5, 0, 25, -15, 30, -2]  
        Cleaned sensor data (non-negative): [10, 0, 25, 30]
```

Altask1-2.2.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text + Run all

Secrets

Configure your code by storing environment variables, file paths, or keys. Values stored here are private, visible only to you and the notebooks that you select.

Secret name cannot contain spaces.

Notebook access	Name	Value	Actions
	GOOGLE_API_KEY	AlraSyANi7wdfS7	

+ Add new secret

Gemini API keys -

Access your secret keys in Python via:

```
from google.colab import userdata
userdata.get('secretName')
```

1 prompt = "Write a Python function called 'filter\_negatives' that takes a list of numbers as input and returns a new list containing only the non-negative numbers. Include a docstring."

2

3 # The previous errors indicated that specific models ('gemini-1.5-flash', 'gemini-pro') were not found or supported for generateContent.

4 # To resolve this, we will dynamically find a model that supports 'generateContent'.

5

6 # Find an available model that supports generateContent

7 selected\_model\_name = None

8 for m in gemini\_list\_models():

9 if 'generateContent' in m.supported\_generation\_methods:

10 selected\_model\_name = m.name

11 break

12

13 if selected\_model\_name:

14 gemini\_model = gemini.GenerativeModel(selected\_model\_name)

15 print(f"Re-initialized Gemini model with dynamically selected model: '{selected\_model\_name}'.")

16 else:

17 raise ValueError("No Gemini model supporting 'generateContent' found.")

18

19 response = gemini\_model.generate\_content(prompt)

20

21 # Extract the generated code from the response

22 generated\_code = response.text.strip().strip('python').strip()

23

24 print("Generated function:\n")

25 print(generated\_code)

26

27 # Execute the generated code to define the function

28 exec(generated\_code)

29

30 print(f"Function 'filter\_negatives' defined in the current environment.")

31

32 Re-initialized Gemini model with dynamically selected model: 'models/gemini-1.5-flash'.

33 Generated function:

34 def filter\_negatives(numbers\_list):

35 """

36 Filters a list of numbers, returning a new list containing only the non-negative numbers.

37 Non-negative numbers include zero and all positive numbers.

38

39 Args:

40 numbers\_list (list): A list of numbers (integers or floats).

41

42 Returns:

43 list: A new list containing only the non-negative numbers from the input list.

44 Returns an empty list if no non-negative numbers are found or if the input list is empty.

45 """

46 non\_negatives = []

47 for number in numbers\_list:

48 if number >= 0:

49 non\_negatives.append(number)

50 return non\_negatives

51

52 # --- Example Usage ---

53 if \_\_name\_\_ == "\_\_main\_\_":

54 list1 = [-5, 0, 5, -2, 10, 2.5]

55 filtered\_list = filter\_negatives(list1)

56 print(f"Original list: {list1}")

57 print(f"Non-negative numbers: {filtered\_list}") # Expected: [0, 5, 10, 2.5]

Variables Terminal

Altask1-2.2.ipynb

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Secrets

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	GOOGLE_API_KEY	AlraSyANi7wdfS7	

+ Add new secret

Gemini API keys -

Access your secret keys in Python via:

```
from google.colab import userdata
userdata.get('secretName')
```

1 Start coding or generate with AI.

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Altask1-2.2.py:nb

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+ Add new secret

Genini API keys

Access your secret keys in Python via:

```
from google.colab import userdata
userdata.get('secretsname')
```

```
def filter_negatives(numbers_list):
    """
    Returns an empty list if no non-negative numbers are found or if the input list is empty.
    """
    non_negatives = []
    for number in numbers_list:
        if number >= 0:
            non_negatives.append(number)
    return non_negatives

# --- Example Usage ---
if __name__ == "__main__":
    list1 = [-1, 0, 5, -3, 10, 2.5]
    filtered_list1 = filter_negatives(list1)
    print(f"Original list: {list1}")
    print(f"Non-negative numbers: {filtered_list1}") # Expected: [0, 5, 10, 2.5]

    list2 = [1, 2, 3, 4, 5]
    filtered_list2 = filter_negatives(list2)
    print(f"Original list: {list2}")
    print(f"Non-negative numbers: {filtered_list2}") # Expected: [1, 2, 3, 4, 5]

    list3 = [-10, -20, -0.5]
    filtered_list3 = filter_negatives(list3)
    print(f"Original list: {list3}")
    print(f"Non-negative numbers: {filtered_list3}") # Expected: []

    list4 = []
    filtered_list4 = filter_negatives(list4)
    print(f"Original list: {list4}")
    print(f"Non-negative numbers: {filtered_list4}") # Expected: []

    list5 = [0, 0, 0]
    filtered_list5 = filter_negatives(list5)
    print(f"Original list: {list5}")
    print(f"Non-negative numbers: {filtered_list5}") # Expected: [0, 0, 0]

    Original list: [-1, 0, 5, -3, 10, 2.5]
    Non-negative numbers: [0, 5, 10, 2.5]

    Original list: [1, 2, 3, 4, 5]
    Non-negative numbers: [1, 2, 3, 4, 5]

    Original list: [-10, -20, -0.5]
    Non-negative numbers: []

Finally, let's demonstrate the function with an example list, showing the list before and after filtering.

1 # Example usage
2 sensor_data = [10, -5, 0, 25, -15, 30, -2]
3
4 print(f"Original sensor data: {sensor_data}")
5
6 # Filter out negative numbers using the generated function
7 cleaned_data = filter_negatives(sensor_data)
8
9 print(f"Cleanned sensor data (non-negative): {cleaned_data}")

Original sensor data: [10, -5, 0, 25, -15, 30, -2]
Cleaned sensor data (non-negative): [10, 0, 25, 30]
```

Variables Terminal

Altask1-2.2.py:nb

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+ Add new secret

Genini API keys

Access your secret keys in Python via:

```
from google.colab import userdata
userdata.get('secretsname')
```

```
Now, let's ask Gemini to generate a Python function that filters out negative numbers from a list.

1 prompt = "Write a Python function called 'filter_negatives' that takes a list of numbers as input and returns a new list containing only the non-negative numbers. Include a docstring."
2
3 # The previous errors indicated that specific models ('gemini-1.5-flash', 'gemini-pro') were not found or supported for generateContent.
4 # To resolve this, we will dynamically find a model that supports 'generateContent'.
5
6 # Find an available model that supports generateContent
7 selected_model_name = None
8 for m in genai.list_models():
9     if 'generateContent' in m.supported_generation_methods:
10         selected_model_name = m.name
11         break
12
13 if selected_model_name:
14     gemini_model = genai.GenerativeModel(selected_model_name)
15     print(f"Re-initialized Gemini model with dynamically selected model: '{selected_model_name}'.")
16 else:
17     raise ValueError("No Gemini model supporting 'generateContent' found.")
18
19 response = gemini_model.generate_content(prompt)
20
21 # Extract the generated code from the response
22 generated_code = response.text.strip().strip('python').strip()
23
24 print(f"Generated function:\n")
25 print(generated_code)
26
27 # Execute the generated code to define the function
28 exec(generated_code)
29
30 print(f"Function 'filter_negatives' defined in the current environment.")

Re-initialized Gemini model with dynamically selected model: 'models/gemini-2.5-flash'.
Generated function:

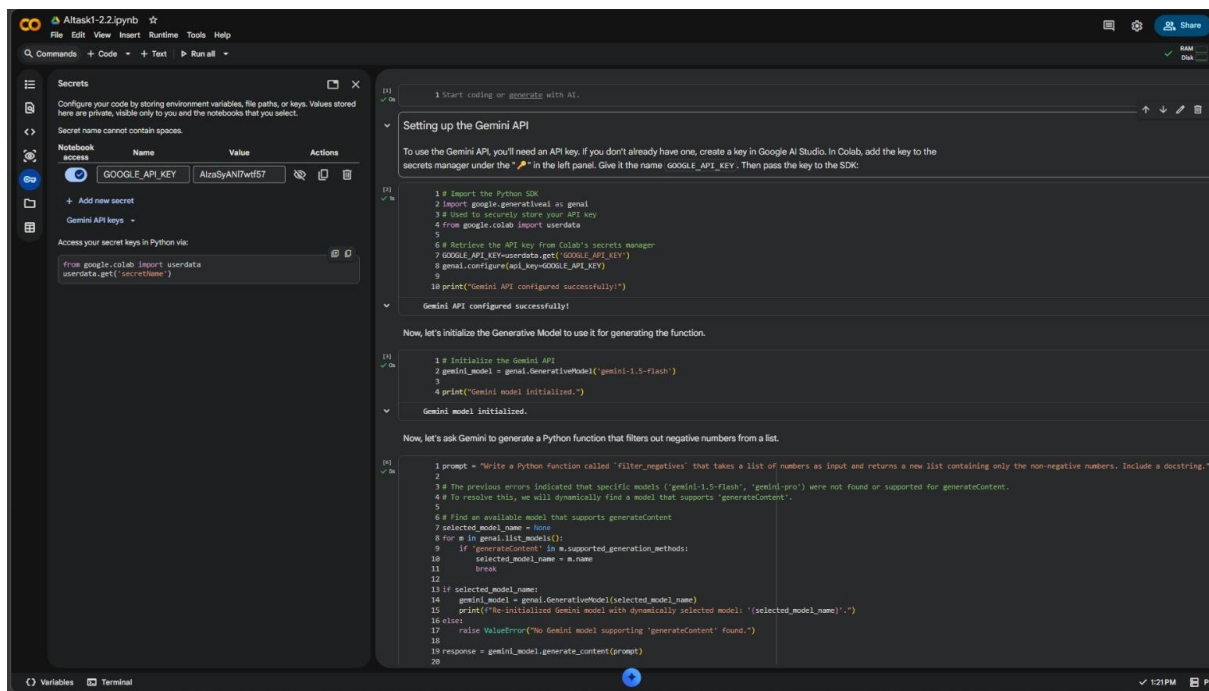
def filter_negatives(numbers_list):
    """
    Filters a list of numbers, returning a new list containing only the non-negative numbers.
    Non-negative numbers include zero and all positive numbers.

    Args:
        numbers_list (list): A list of numbers (integers or floats).

    Returns:
        list: A new list containing only the non-negative numbers from the input list.
        Returns an empty list if no non-negative numbers are found or if the input list is empty.
    """
    non_negatives = []
    for number in numbers_list:
        if number >= 0:
            non_negatives.append(number)
    return non_negatives

# --- Example Usage ---
if __name__ == "__main__":
    list1 = [-1, 0, 5, -3, 10, 2.5]
    filtered_list1 = filter_negatives(list1)
```

Variables Terminal



## Task 2: String Character Analysis

### ❖ Scenario:

You are building a text-analysis feature.

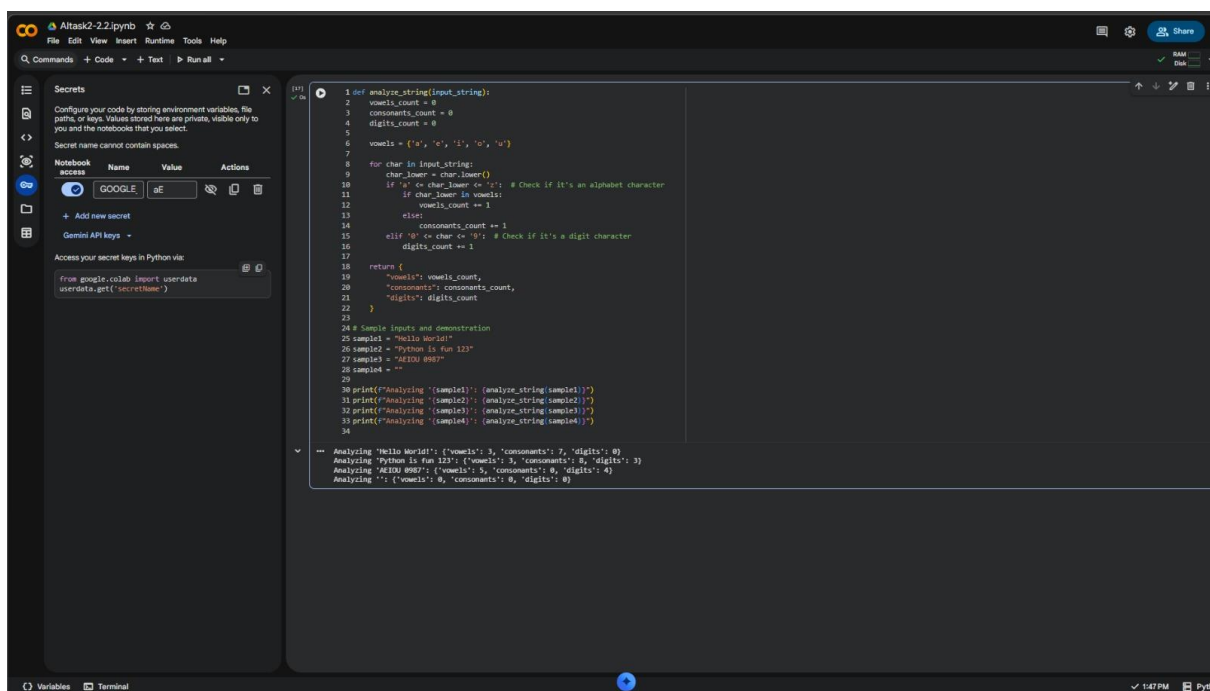
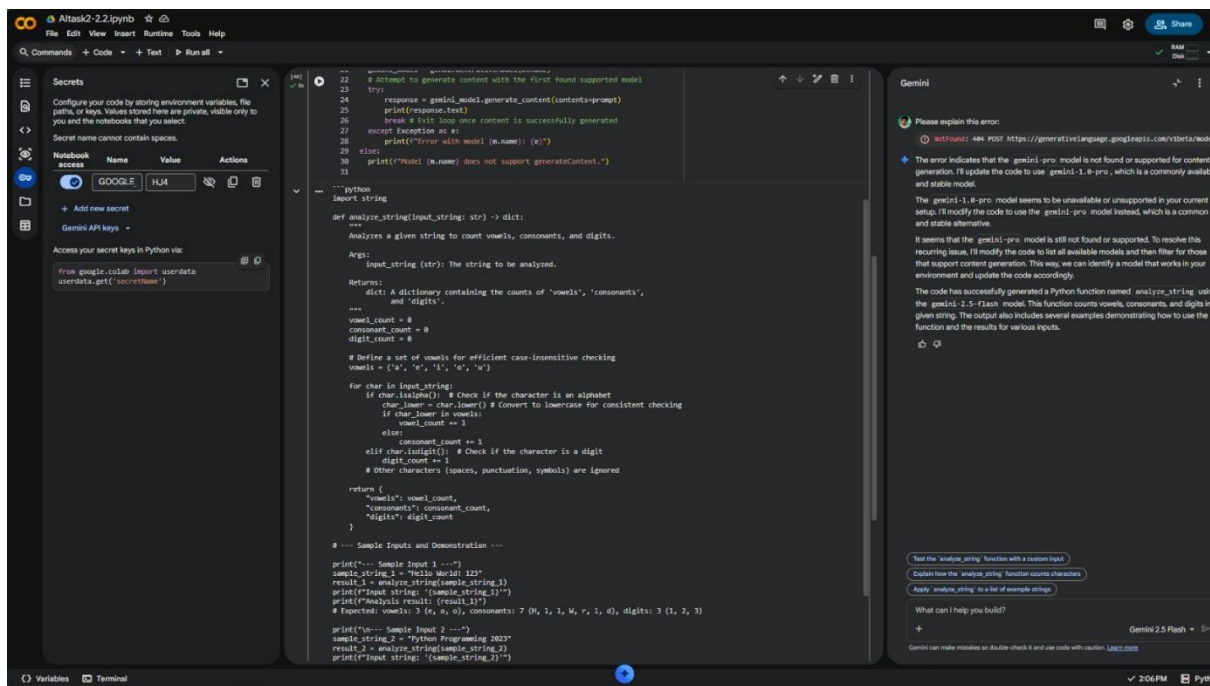
### ❖ Task:

Use Gemini to generate a Python function that counts vowels, consonants, and digits in a string.

### ❖ Expected Output:

➤ Working function

➤ Sample inputs and outputs



## Task 3: Palindrome Check – Tool Comparison

### ❖ Scenario:

You must decide which AI tool is clearer for string logic.

### ❖ Task:

**Generate a palindrome-checking function using Gemini and Copilot, then compare the results.**

❖ **Expected Output:**

- **Side-by-side code comparison**
- **Observations on clarity and structure**

Feature	Google Gemini (Colab)	GitHub Copilot / Cursor AI
Logic Approach	Often uses <code>string == string[::-1]</code> (slicing) for simplicity.	Often provides more "robust" versions, sometimes using <code>reversed()</code> or loops.
Documentation	Provides conversational explanations and usage examples.	Provides inline docstrings and focuses on integration within the IDE.
Conciseness	Very concise, aims for readability.	Aims for production-readiness (handling edge cases like spaces/case).

**Task 4: Code Explanation Using AI**

❖ **Scenario:**

**You are reviewing unfamiliar code written by another developer.**

❖ **Task:**

**Ask Gemini to explain a Python function (prime check OR palindrome check) line by line.**

❖ **Expected Output:**

- **Code snippet**

## ➤ AI explanation

## ➤ Student comments on understanding

```
C:\Users> cd > AppData\Local> Packages> 5319275A-WhatsAppDesktop_cvg1qyaygjm > LocalState> sessions> CBF976C9D93CAF1F843B07A2E394FAB8FDC9C > transfers> 2026-02 > assign-202305A51118-copilot.py > ...

1 | from typing import List
2 | def is_palindrome(s: str) -> bool:
3 |     cleaned = ''.join(c.lower() for c in s if c.isalnum())
4 |     return cleaned == cleaned[::-1]
5 |
6 | # Test cases
7 | print(is_palindrome("A man a plan a canal Panama")) # True
8 | print(is_palindrome("race a car")) # False
9 |
10 | # Comparison: Gemini AI vs Copilot
11 |
12 | 1 Coding Performance:
13 | - Copilot is generally better integrated into IDEs for fast code suggestions and developer workflows.
14 | - Gemini can generate code too, but tends to be slower and broader-focused rather than as tightly embedded into editor workflows.
15 | - Winner for pure coding speed: Copilot
16 |
17 | 2 Context & Reasoning:
18 | - Gemini excels at deep reasoning, large context understanding (docs + code + research), and handling multimodal inputs like images/diagrams.
19 | - Copilot is optimized for shorter, code-centric tasks within text editors.
20 | - Winner for complex tasks: Gemini
21 |
22 | 3 Integration & Workflow:
23 | - Copilot works directly in popular editors with minimal setup.
24 | - Gemini can integrate through CLI or APIs and into Google's ecosystem, but isn't as IDE-native by default (though integrations are growing).
25 | - Winner for seamless coding experience: Copilot
26 |
27 | 4 Multimodal & General Intelligence:
28 | - Gemini supports multimodal input (text, visuals) and broader tasks like research, explanations, documentation, strategy, etc.
29 | - Copilot focuses on code generation and in-editor support only.
30 | - Winner for versatility: Gemini
31 |
32 | 5 Pricing & Value
33 |
34 | - Copilot is usually around $10/mo for individuals and integrated deeply with GitHub tools.
35 | - Gemini varies by plan but often comes bundled with Google services (Cloud, Workspace), and free tiers like Gemini CLI offer generous daily usage.
36 | - Winner depends on budget & ecosystem needs.
37 |
38 | 6 So Which One is Better?
39 | The Case for Better Choice:
40 | - Daily coding, fast suggestions inside your editor: GitHub Copilot
41 | - Complex tasks: reasoning, docs, long projects, multimodal input: Google Gemini
42 | - Working within GitHub & developer workflow: Copilot
43 | - Handling diverse non-code tasks or big context workflows: Gemini
44 |
45 | 7 Many developers actually use both:
46 | - Copilot for IDE coding speed.
47 | - Gemini for deep questions, research, design docs, and multimodal tasks.
48 |
49 | 8 Quick Summary
50 |
51 | - Copilot: Best code-focused assistant with strong editor integration and real-time code generation.
52 | - Gemini: Best general AI partner for big-picture thinking, multimodal understanding, and broad tasks beyond code.
```