

ASSIGNMENT :2.2

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TASK-1:

PROMPT:

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

CODE:

The screenshot shows a Google Colab notebook titled "Untitled28.ipynb". In cell (1), a Python script generates a list of 10 random integers, including positive, negative, and zero. In cell (2), a function `filter_negative_numbers` is defined to filter out negative numbers from a given list. A Gemini AI interface is overlaid on the right side of the screen, responding to a prompt to generate a function that filters out negative numbers from a list. The AI suggests generating a sample list and defining a function to filter it. The user can accept or cancel the suggestion. The AI also asks what else can be built. The bottom status bar shows the time as 1:40 PM and the Python version as Python 3.

```
# Generate a list of 10 random integers, including positive, negative, and zero
numbers = [random.randint(-10, 10) for _ in range(10)]
print("Original list:", numbers)

Original list: [-5, 9, 5, -10, -7, -7, 8, 1, -10, -4]

def filter_negative_numbers(input_list):
    """
    Filters out all negative numbers from a given list.

    Args:
        input_list (list): The list of numbers to filter.

    Returns:
        list: A new list containing only non-negative numbers.
    """
    return [num for num in input_list if num >= 0]

# Apply the function to the generated list
filtered_numbers = filter_negative_numbers(numbers)
print("Filtered list (non-negative numbers only):", filtered_numbers)
```

OBSERVATION:

The original list contains a mix of negative numbers, zero, and positive numbers, generated randomly using random. The function `filter_negative_numbers()` correctly removes all negative values from the list. The filtered list includes only non-negative numbers (i.e., 0 and positive integers). The order of elements is preserved, meaning the relative sequence of numbers remains the same as in the original list. • This confirms that the

function works as intended and efficiently filters the data using list comprehension, which is both concise and readable

TASK:2

PROMPT:

USE GEMINI TO GENERATE A PYTHON FUNCTION THAT COUNTS VOWELS, CONSONANTS, AND DIGITS IN A STRING.

CODE:

The screenshot shows a Jupyter Notebook interface with a code cell containing the following Python function:

```
vowel_count = 0
consonant_count = 0
digit_count = 0

def count_chars(string):
    for char in string:
        if char in "aeiouAEIOU":
            vowel_count += 1
        else:
            consonant_count += 1
        elif char.isdigit(): # Check if the character is a digit
            digit_count += 1

    return {
        "vowels": vowel_count,
        "consonants": consonant_count,
        "digits": digit_count
    }

# Example usage:
my_string = "Hello World 123!"
counts = count_chars(my_string)
print(f"The string '{my_string}' contains:")
print(f" Vowels: {counts['vowels']}")
print(f" Consonants: {counts['consonants']}")
print(f" Digits: {counts['digits']}")
```

The output of the code cell shows the counts for the string "Hello World 123!":

```
... The string 'Hello World 123!' contains:
Vowels: 3
Consonants: 7
Digits: 3
```

A Gemini AI sidebar is open, showing a generated response:

T generate a Python function that counts vowels, consonants, and digits in a string.

◆ Certainly! Here's a Python function that counts vowels, consonants, and digits in a given string, along with an example of how to use it.

▶ Accept & Run ✓ Accept ✕ Cancel

What can I help you build?

+ Gemini 2.5 Flash ▶

Gemini can make mistakes so double-check it and use code with caution. [Learn more](#)

OBSERVATION:

The input string "Hello World 123!" contains alphabets, digits, spaces, and a special character. • The function `count_chars()` correctly:

- o Identifies vowels by checking membership in the predefined vowel set (aeiouAEIOU).
- o Counts consonants by excluding vowels from alphabetic characters.
- o Counts digits using the `isdigit()` method.
- Spaces and special characters (like !) are ignored, as expected.
- For the given input:
- o Vowels → 3 (e, o, o)
- o Consonants → 7 (H, l, l, W, r, l, d)

Digits → 3 (1, 2, 3) The function uses clear logic and built-in string methods, making it easy to understand and efficient.

TASK:3

PROMPT:

GENERATE A PALINDROME-CHECKING FUNCTION USING GEMINI AND COPILOT, THEN COMPARE THE RESULTS.

CODE:

```
[4]  ✓ 0s
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
returns:
    bool: True if the string is a palindrome, False otherwise.
"""

# Remove non-alphanumeric characters and convert to lowercase
processed_text = ''.join(char.lower() for char in text if char.isalnum())

# Compare the processed string with its reverse
return processed_text == processed_text[::-1]

# Test cases
print("Palindrome checker results:")
print(f"'madam' is a palindrome: {is_palindrome('madam')}")
print(f"'A man, a plan, a canal: Panama' is a palindrome: {is_palindrome('A man, a plan, a canal: Panama')}")
print(f"'racecar' is a palindrome: {is_palindrome('racecar')}")
print(f"'hello' is a palindrome: {is_palindrome('hello')}")
print(f"'Python' is a palindrome: {is_palindrome('Python')}")
print(f"'No lemon, no melon' is a palindrome: {is_palindrome('No lemon, no melon')}")

...
Palindrome checker results:
'madam' is a palindrome: True
'A man, a plan, a canal: Panama' is a palindrome: True
'racecar' is a palindrome: True
'hello' is a palindrome: False
'Python' is a palindrome: False
'No lemon, no melon' is a palindrome: True
```

The screenshot shows a Jupyter Notebook cell with a Python script for checking if a string is a palindrome. The code removes non-alphanumeric characters, converts the string to lowercase, and then compares it with its reverse. It includes several test cases, such as 'madam', 'A man, a plan, a canal: Panama', 'racecar', 'hello', 'Python', and 'No lemon, no melon'. The output of the code is displayed below the code cell. To the right, a Gemini AI sidebar is open, showing a conversation where the user asks Gemini to generate a palindrome-checking function and compare the results. Gemini responds by generating the Python code and running some examples. The sidebar also includes a message from Gemini about potential mistakes and a 'Gemini 2.5 Flash' button.

OBSERVATION:

The palindrome-checking function generated using Gemini/Copilot works correctly for different types of inputs. The function preprocesses the input string by: Removing non-alphanumeric characters. Converting all characters to lowercase. This preprocessing allows the function to correctly identify phrase-level palindromes, not just simple words.

TASK:4

PROMPT:

ASK GEMINI TO EXPLAIN A PYTHON FUNCTION (PRIME CHECK OR PALINDROME CHECK) LINE BY LINE

EXPLANATION:

def is_palindrome(text This line defines a function named is_palindrome that takes one argument: text (which is expected to be a string). """...""" This is a docstring, which provides a brief description of what the function does, its arguments (Args), and what it returns (Returns). It's good practice for documenting code.
processed_text = ".join(char.lower() for char in text if char.isalnum())
This is the core of the pre-processing step: for char in text: It iterates through each character in the input text string. if char.isalnum(): It checks if the character is alphanumeric (i.e., a letter or a number). This effectively filters out spaces, punctuation, and other symbols.
char.lower(): For each alphanumeric character, it converts it to lowercase. This ensures that case doesn't affect the palindrome check (e.g., 'Racecar' should be considered a palindrome). ".join(...): It concatenates all the filtered and lowercased characters back into a single string. The result is stored in the processed_text variable.
return processed_text == processed_text[::-1]