School of Computer Science and Artificial Intelligence

Lab Assignment # 4.2

Program : B. Tech (CSE)

Specialization :AIML

Course Title : AI Assisted Coding

Course Code : 23CS002PC304

Semester : VI

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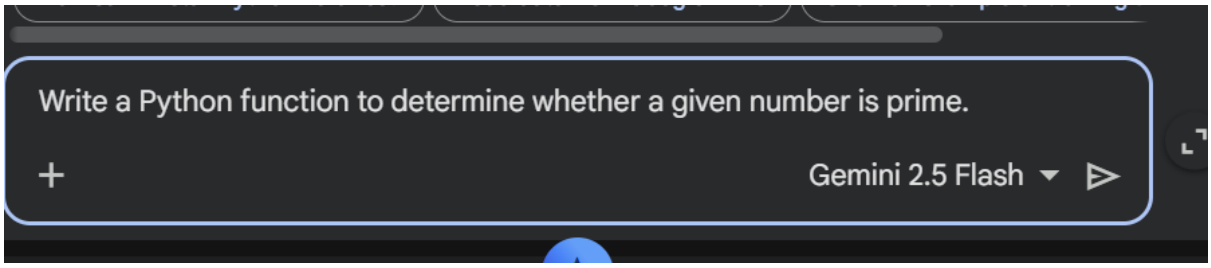
Batch No. : 33

Date :19/01/26

Task – 1 : ZERO-SHOT PROMPTING

Prompt Used:

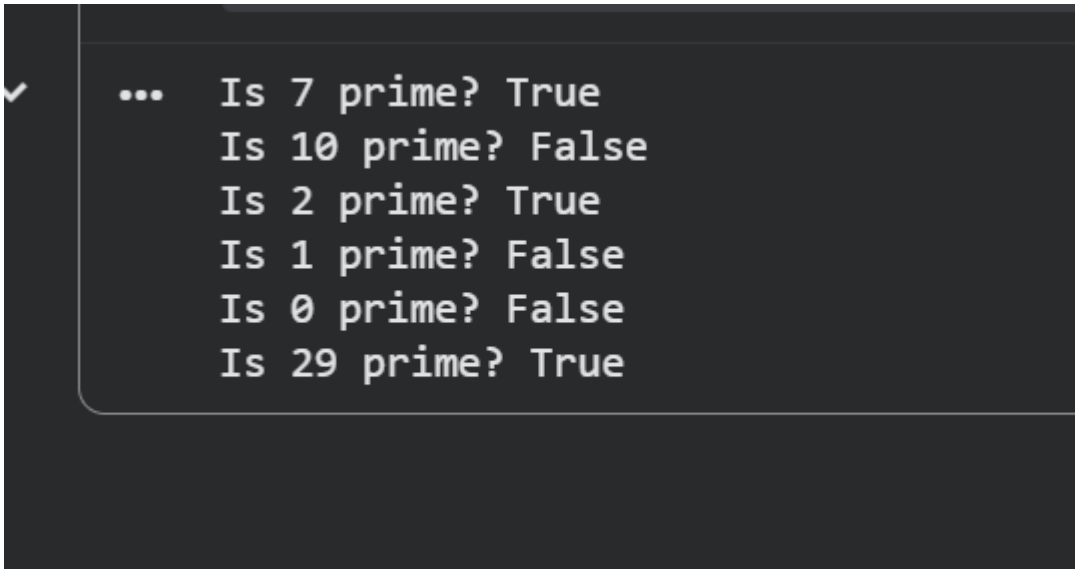


Code:

```
def is_prime(number):
    """
    Determines whether a given number is prime.

    A prime number is a natural number greater than 1 that has no positive
    divisors other than 1 and itself.

    Args:
        number (int): The integer to check for primality.

    Returns:
        bool: True if the number is prime, False otherwise.
    """
    if not isinstance(number, int):
        raise TypeError("Input must be an integer.")
    if number < 2:
        return False  # Numbers less than 2 are not prime
    for i in range(2, int(number**0.5) + 1):
        if number % i == 0:
            return False  # Found a divisor, so it's not prime
```

```
    return True  # No divisors found, it's prime


# Example usage:
print(f"Is 7 prime? {is_prime(7)}")
print(f"Is 10 prime? {is_prime(10)}")
print(f"Is 2 prime? {is_prime(2)}")
print(f"Is 1 prime? {is_prime(1)}")
print(f"Is 0 prime? {is_prime(0)}")
print(f"Is 29 prime? {is_prime(29)}")
```

Output:

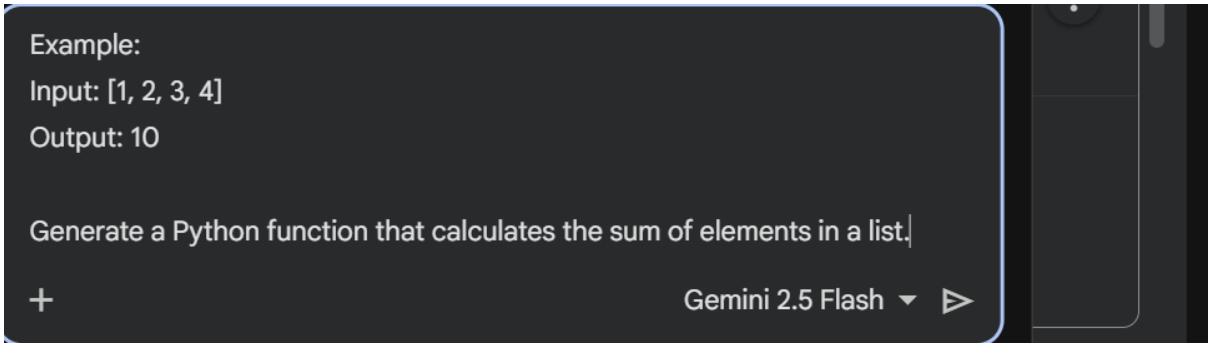


Explanation

The function is_prime() checks whether a given number is prime. It first validates that the input is an integer and raises an error if not. Numbers less than 2 are immediately considered non-prime. The function then checks divisibility only up to the square root of the number for efficiency. If any divisor is found, it returns False, otherwise it returns True, confirming the number is prime. Example outputs demonstrate correct behavior for different inputs.

Task – 2 : ONE-SHOT PROMPTING

Prompt Used:

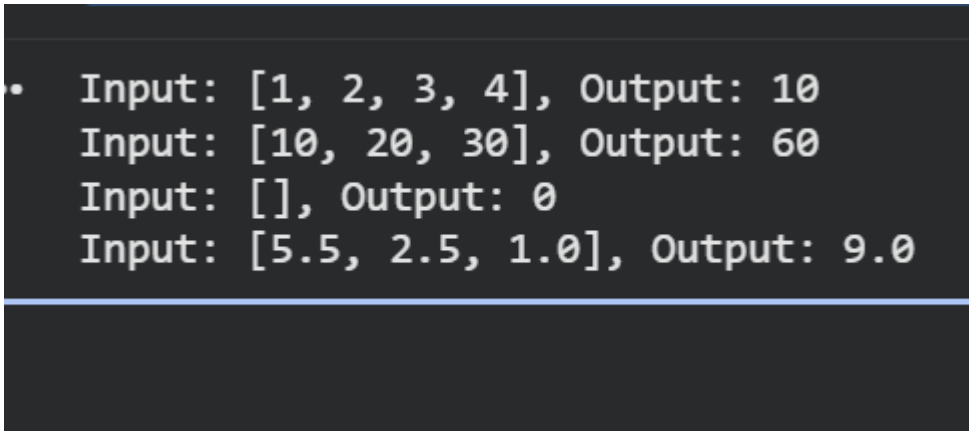


Code:

```
def calculate_list_sum(input_list):
    """
    Calculates the sum of all numeric elements in a list.

    Args:
        input_list (list): A list containing numeric elements.

    Returns:
        (int or float): The sum of the elements in the list.

    Raises:
        TypeError: If the input is not a list.
    """
    if not isinstance(input_list, list):
        raise TypeError("Input must be a list.")

    total_sum = 0
    for item in input_list:
        # Optional: Add check for non-numeric items if strictness is required
```

```
        # if not isinstance(item, (int, float)):
        #     raise TypeError(f"All elements in the list must be numbers. Found: {type(item)}")
        total_sum += item
    return total_sum

# Example usage:
list1 = [1, 2, 3, 4]
print(f"Input: {list1}, Output: {calculate_list_sum(list1)}")

list2 = [10, 20, 30]
print(f"Input: {list2}, Output: {calculate_list_sum(list2)}")

list3 = []
print(f"Input: {list3}, Output: {calculate_list_sum(list3)}")

list4 = [5.5, 2.5, 1.0]
print(f"Input: {list4}, Output: {calculate_list_sum(list4)}")
```

Output:



Explanation

The function calculate_list_sum() computes the total sum of all elements in a given list. It first checks whether the input is a valid list and raises an error if not. The function then initializes a variable total_sum to zero and iterates through each element in the list, adding them to the total.

Finally, it returns the calculated sum. The example outputs show that the function works correctly for integer, float, and empty lists.

Task – 3 : FEW-SHOT PROMPTING

Prompt Used:

Examples:
Input: "a1b2c3" → Output: "123"
Input: "abc456" → Output: "456"
Input: "x9y8" → Output: "98"

Write a function to extract digits from an alphanumeric string.

Code:

```
def extract_digits(input_string):
    """
    Extracts all digit characters from an alphanumeric string.

    Args:
        input_string (str): The alphanumeric string to process.

    Returns:
        str: A new string containing only the digits from the input_string.
             Returns an empty string if no digits are found.
    """
    if not isinstance(input_string, str):
        raise TypeError("Input must be a string.")

    digits = ""
```

```
    for char in input_string:
        if char.isdigit():
            digits += char
    return digits

# Example usage:
input1 = "a1b2c3"
print(f"Input: \"{input1}\" -> Output: \"{extract_digits(input1)}\"")

input2 = "abc456"
print(f"Input: \"{input2}\" -> Output: \"{extract_digits(input2)}\"")

input3 = "x9y8"
print(f"Input: \"{input3}\" -> Output: \"{extract_digits(input3)}\"")

input4 = "hello_world"
print(f"Input: \"{input4}\" -> Output: \"{extract_digits(input4)}\"")

input5 = "123testing456"
print(f"Input: \"{input5}\" -> Output: \"{extract_digits(input5)}\"")
```

Output:

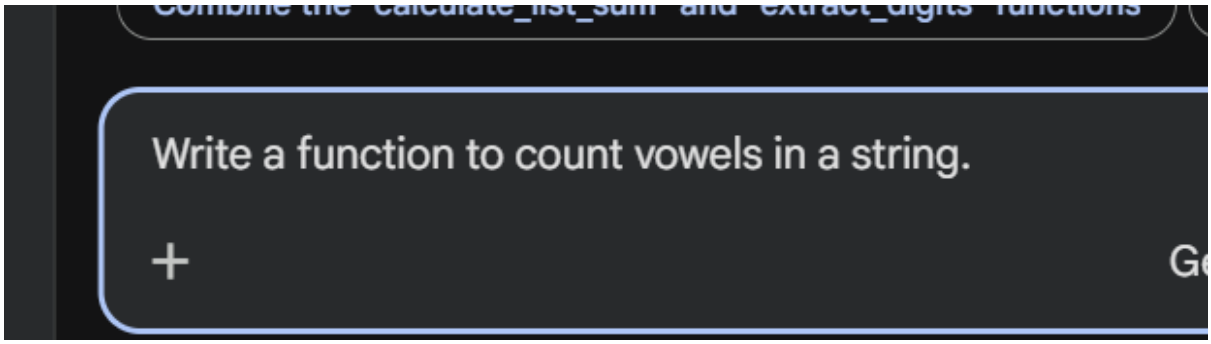
```
Input: "a1b2c3" -> Output: "123"
Input: "abc456" -> Output: "456"
Input: "x9y8" -> Output: "98"
Input: "hello_world" -> Output: ""
Input: "123testing456" -> Output: "123456"
```

Explanation:

The function extract_digits() extracts only the numeric characters from a given alphanumeric string. It first checks whether the input is a valid string and raises an error if not. The function then iterates through each character of the string and uses the isdigit() method to identify digits. All detected digits are concatenated into a new string, which is returned as the final result. If no digits are present, the function returns an empty string.

Task – 4 : ZERO-SHOT VS FEW-SHOT COMPARISON

A) Zero-shot Prompt

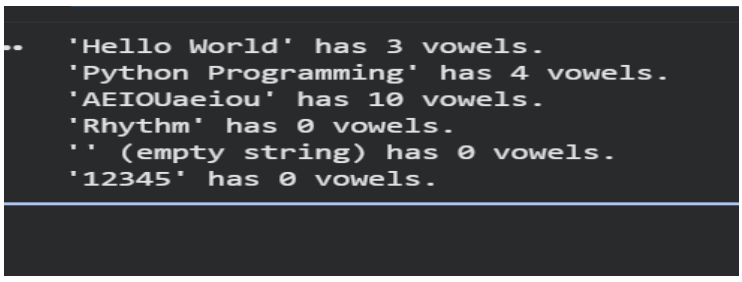


Code:

```
def count_vowels(input_string):
    """
    Counts the number of vowels (a, e, i, o, u, case-insensitive) in a string.

    Args:
        input_string (str): The string to analyze.

    Returns:
        int: The total count of vowels in the string.

    Raises:
```

```
    TypeError: If the input is not a string.
    """
    if not isinstance(input_string, str):
        raise TypeError("Input must be a string.")

    vowels = "aeiouAEIOU"
    vowel_count = 0
    for char in input_string:
        if char in vowels:
            vowel_count += 1
    return vowel_count

# Example usage:
print(f"'Hello World' has {count_vowels('Hello World')} vowels.")
print(f"'Python Programming' has {count_vowels('Python Programming')} vowels.")
print(f"'AEIOUaeiou' has {count_vowels('AEIOUaeiou')} vowels.")
print(f"'Rhythm' has {count_vowels('Rhythm')} vowels.")
print(f"" (empty string) has {count_vowels('')} vowels.")
print(f"'12345' has {count_vowels('12345')} vowels.")
```

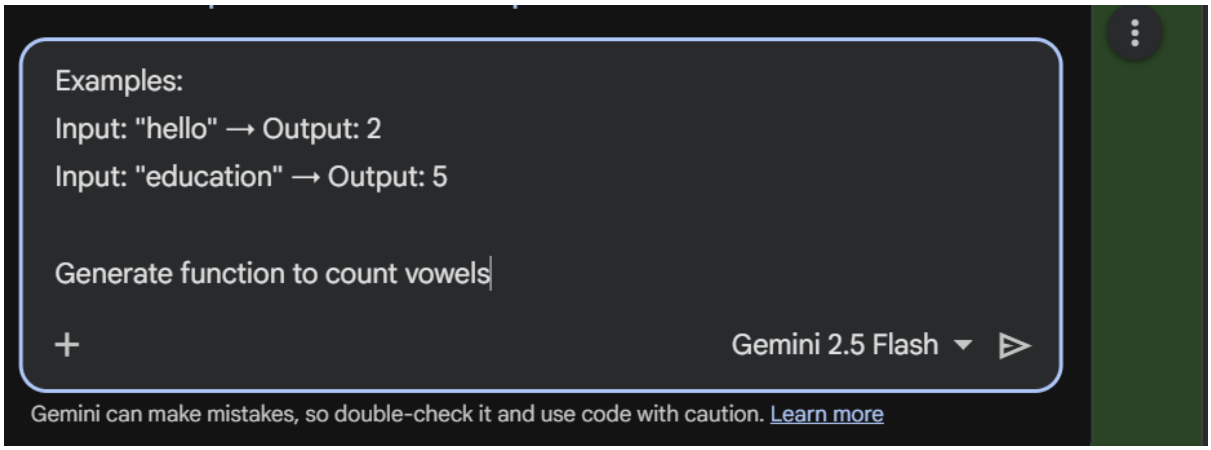
Output:



Explanation:

The function count_vowels() calculates the total number of vowels in a given string. It first checks whether the input is a valid string and raises an error if not. A string containing all uppercase and lowercase vowels is defined, and the function iterates through each character of the input. If a character matches any vowel, the counter is increased. Finally, the function returns the total vowel count. The example outputs confirm correct behavior for different types of inputs.

B) Few-shot Prompt:



Code:

```
print(f"'hello' has {count_vowels('hello')} vowels.")
print(f"'education' has {count_vowels('education')} vowels.")
```

Output:

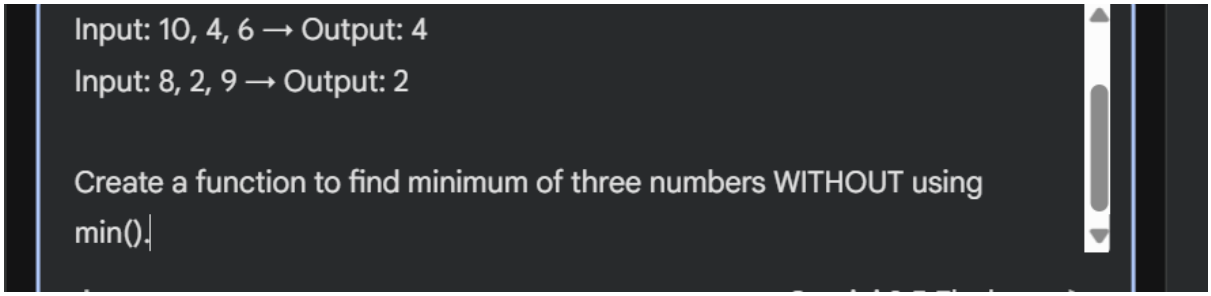
```
'hello' has 2 vowels.
'education' has 5 vowels.
```

Explanation:

This demonstrate how the function works with sample inputs. The word *"hello"* contains 2 vowels, and *"education"* contains 5 vowels, which confirms that the function correctly counts vowels in different strings

Task – 5 : FEW-SHOT PROMPTING

Prompt Used:



Code:

```
def find_minimum_of_three(num1, num2, num3):
    """
    Finds the minimum of three given numbers without using the built-in min() function.

    Args:
        num1 (int or float): The first number.
        num2 (int or float): The second number.
        num3 (int or float): The third number.

    Returns:
        (int or float): The smallest of the three numbers.
    """
    if not all(isinstance(arg, (int, float)) for arg in [num1, num2, num3]):
        raise TypeError("All inputs must be numbers.")

    if num1 <= num2 and num1 <= num3:
        return num1
```

```
    elif num2 <= num1 and num2 <= num3:
        return num2
    else:
        return num3

# Example usage:
print(f"Input: 3, 7, 5 → Output: {find_minimum_of_three(3, 7, 5)}")
print(f"Input: 10, 4, 6 → Output: {find_minimum_of_three(10, 4, 6)}")
print(f"Input: 8, 2, 9 → Output: {find_minimum_of_three(8, 2, 9)}")
print(f"Input: 1.5, 0.5, 2.0 → Output: {find_minimum_of_three(1.5, 0.5, 2.0)}")
print(f"Input: 5, 5, 5 → Output: {find_minimum_of_three(5, 5, 5)}")
```

Output:

```
Input: 3, 7, 5 → Output: 3
Input: 10, 4, 6 → Output: 4
Input: 8, 2, 9 → Output: 2
Input: 1.5, 0.5, 2.0 → Output: 0.5
Input: 5, 5, 5 → Output: 5
```

Explanation:

The function find_minimum_of_three() determines the smallest value among three numbers without using the built-in min() function. It first verifies that all inputs are numeric values and raises an error if invalid data is provided. The function then compares the three numbers using conditional statements. If the first number is less than or equal to the others, it is returned as the minimum. Otherwise, the second or third number is returned based on comparisons. The example outputs confirm that the function correctly identifies the minimum value in different cases.