SR UNIVERSITY

School of Computer Science and Artificial Intelligence

Lab Assignment # 2.2

Program	**: B. Tech (CSE)**
Specialization	**:**
Course Title	**: AI Assisted coding**
Course Code	**:**
Semester	**: II**
Academic Session	**: 2025-2026**
Name of Student	**: Naniprasad Macharla**
Enrollment No.	**: 2403A51L11**
Batch No.	**: 51**
Date	**:13-01-2026**

Submission Starts here

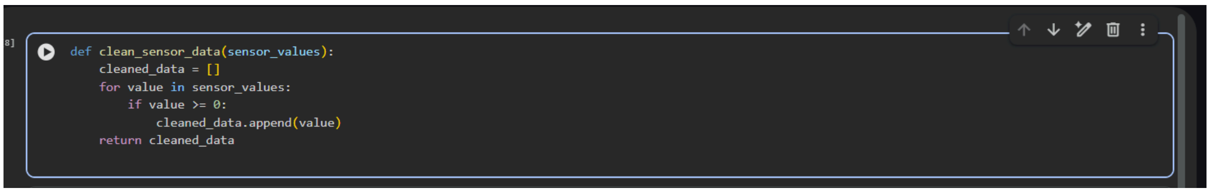
Task-1: Cleaning Sensor Data

❖ Scenario:

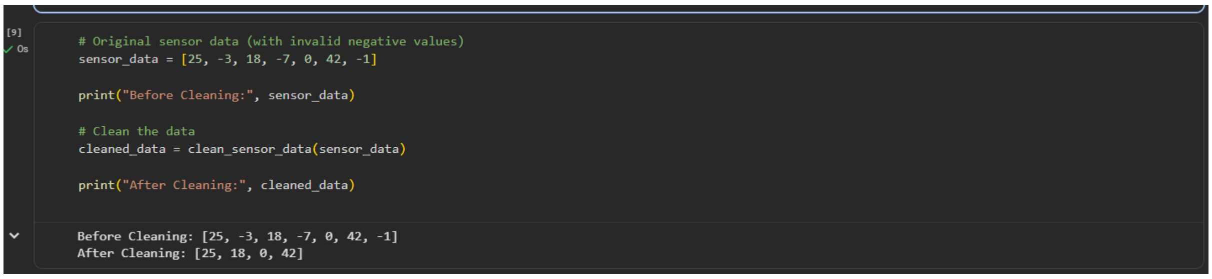
❖ You are cleaning IoT sensor data where negative values are invalid.

❖ Task:

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



```python
def clean_sensor_data(sensor_values):
    cleaned_data = []
    for value in sensor_values:
        if value >= 0:
            cleaned_data.append(value)
    return cleaned_data
```



```python
# Original sensor data (with invalid negative values)
sensor_data = [25, -3, 18, -7, 0, 42, -1]

print("Before Cleaning:", sensor_data)

# Clean the data
cleaned_data = clean_sensor_data(sensor_data)

print("After Cleaning:", cleaned_data)
```

```
Before Cleaning: [25, -3, 18, -7, 0, 42, -1]
After Cleaning: [25, 18, 0, 42]
```

Line-by-Line Explanation

1 def clean_sensor_data(sensor_values):

- Defines a function named **clean_sensor_data**
- sensor_values is the input list containing sensor readings (may include negative values)

2 cleaned_data = []

- Creates an **empty list**
- This list will store only **valid (non-negative)** sensor values

3 for value in sensor_values:

- Loops through **each value** in the input sensor list

- Processes one sensor reading at a time

4️⃣ **if value >= 0:**
- Checks whether the sensor value is **greater than or equal to zero**
- This condition ensures that **negative values are ignored**

5️⃣ **cleaned_data.append (value)**
- Adds the valid sensor value to the cleaned_data list

6️⃣ **return cleaned_data**
- Returns the final list containing **only valid sensor readings**

▶️ **Example Execution Explanation**

sensor_data = [25, -3, 18, -7, 0, 42, -1]

- Input list contains both valid and invalid sensor values
-

cleaned_data = clean_sensor_data (sensor_data)
- Function removes all negative values

✅ **Output:**

[25, 18, 0, 42]

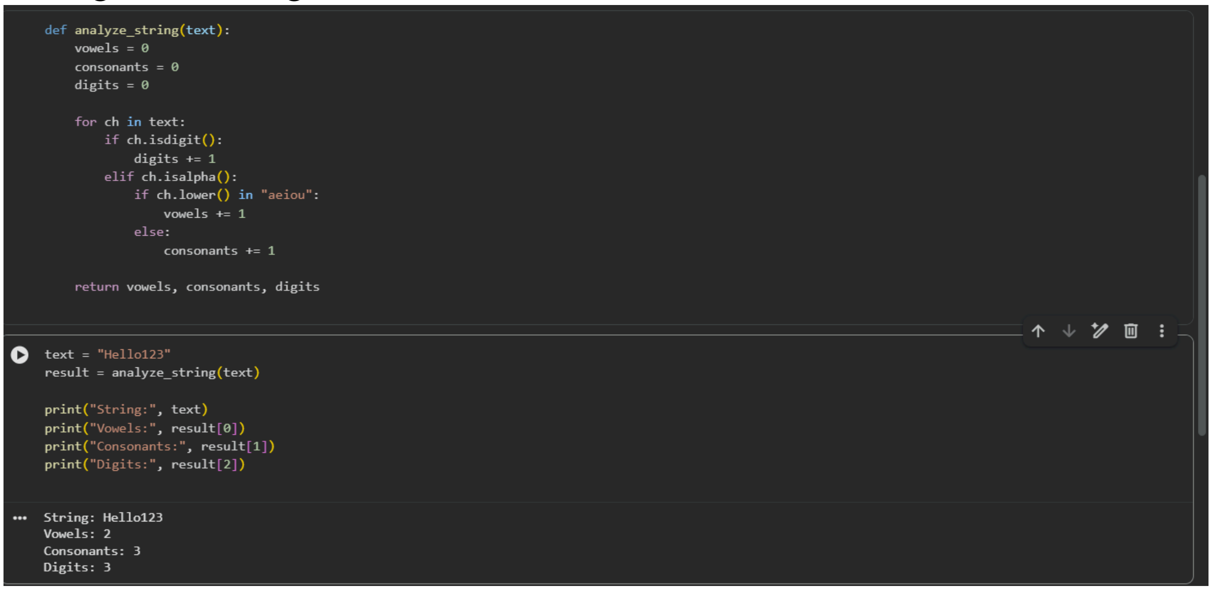
# **Task 2:** String Character Analysis

❖ 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.



```python
def analyze_string(text):
    vowels = 0
    consonants = 0
    digits = 0

    for ch in text:
        if ch.isdigit():
            digits += 1
        elif ch.isalpha():
            if ch.lower() in "aeiou":
                vowels += 1
            else:
                consonants += 1

    return vowels, consonants, digits
```

```python
text = "Hello123"
result = analyze_string(text)

print("String:", text)
print("Vowels:", result[0])
print("Consonants:", result[1])
print("Digits:", result[2])
```

```
String: Hello123
Vowels: 2
Consonants: 3
Digits: 3
```

Explaination:

1️⃣def analyze_string(text):

- Defines a function named analyze_string
- text is the input string that will be analyzed

2️⃣vowels = 0, consonants = 0, digits = 0

- Initializes three counters
- These variables store the count of vowels, consonants, and digits

3️⃣for ch in text:

- Loops through each character in the input string
- Processes one character at a time

4️⃣if ch.isdigit():

- Checks if the character is a number (0–9)
- If true, the digit counter is increased

5️⃣digits += 1:

- Increments the digit count by 1

6️⃣elif ch.isalpha():

- Checks if the character is an alphabet
- Ignores spaces and special characters

7️⃣if ch.lower() in "aeiou":

- Converts the character to lowercase
- Checks if it is a vowel (a, e, i, o, u)

8️⃣vowels += 1

- Increments the vowel count if the condition is true

9️⃣**else:**

- If the alphabet is **not a vowel**, it must be a consonant

🔟 **consonants += 1**

- Increments the consonant count

1️⃣1️⃣**return vowels, consonants, digits**

- Returns all three counts as a tuple

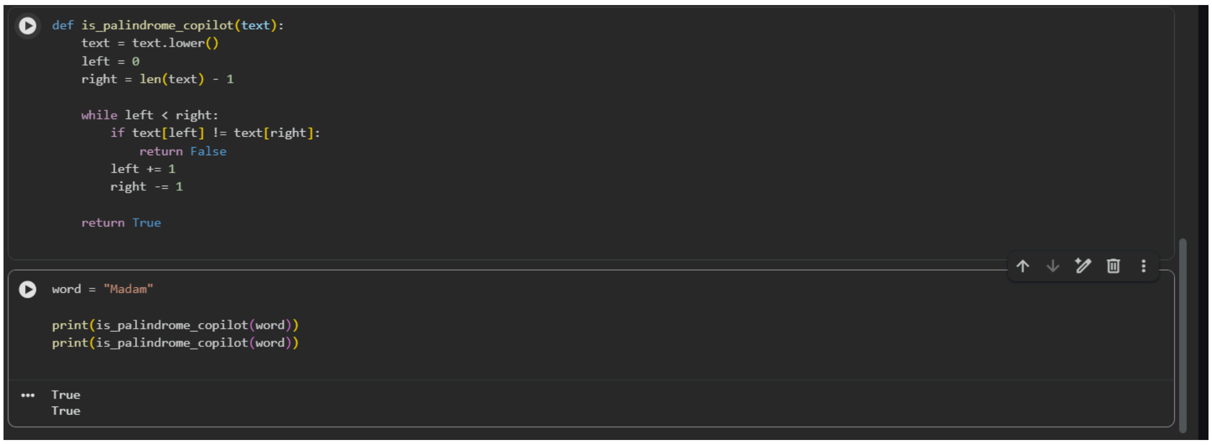
#Task 3: Palindrome Check – Tool Comparison

❖ 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.



```
def is_palindrome_copilot(text):
    text = text.lower()
    left = 0
    right = len(text) - 1

    while left < right:
        if text[left] != text[right]:
            return False
        left += 1
        right -= 1

    return True
```

```
word = "Madam"

print(is_palindrome_copilot(word))
print(is_palindrome_copilot(word))
```

```
True
True
```

Explaination:

1️⃣def is_palindrome_gemini(text):

- Defines a function to check whether a string is a palindrome
- text is the input string

2️⃣text = text.lower()

- Converts all characters to lowercase
- This avoids case mismatch (e.g., Madam vs madam)

3️⃣text[::-1]

- Reverses the string using Python slicing
- [::-1] means read the string from end to start

4️⃣return text == text[::-1]

- Compares the original string with its reversed version
- Returns True if both are the same, otherwise False

def is_palindrome_copilot(text):

- Defines a function to check if a string is a palindrome

2️⃣text = text.lower()

- Converts the string to lowercase for case-insensitive comparison

3️⃣left = 0

- Points to the **first character** of the string

4️⃣right = len(text) - 1

- Points to the **last character** of the string

5️⃣while left < right:

- Loop runs until both pointers meet in the middle

6️⃣if text[left] != text[right]:

- Compares characters from both ends
- If they are not equal, the string is **not a palindrome**

7️⃣return False

- Immediately stops and returns False if mismatch is found

8️⃣left += 1

- Moves the left pointer forward

9️⃣right -= 1

- Moves the right pointer backward

🔟 return True

- If all characters match, the string is a palindrome

#Task 4: Code Explanation Using AI

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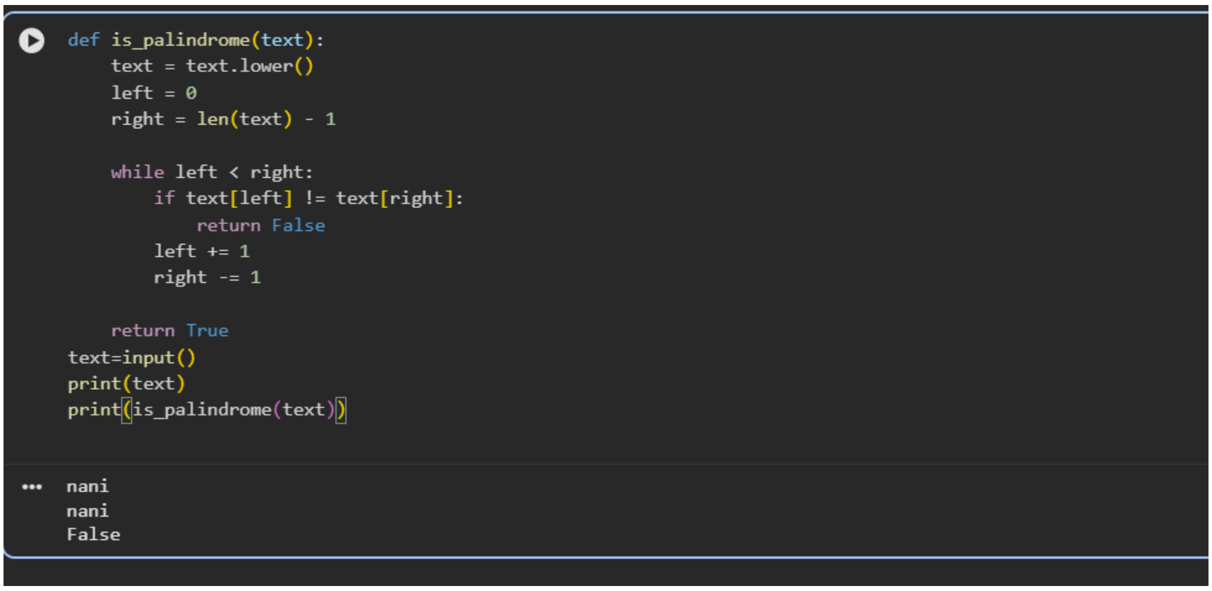
❖ Scenario:

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.



```
def is_palindrome(text):
    text = text.lower()
    left = 0
    right = len(text) - 1

    while left < right:
        if text[left] != text[right]:
            return False
        left += 1
        right -= 1

    return True
text=input()
print(text)
print(is_palindrome(text))
```

```
nani
nani
False
```

Explaination:

1 def is_palindrome(text):

- Defines a function named is_palindrome
- Takes a string text as input

2 text = text.lower()

- Converts all characters in the string to lowercase
- Ensures case-insensitive comparison (e.g., Madam = madam)

3 left = 0

- Initializes a pointer to the **first character** of the string

4 right = len(text) - 1

- Initializes a pointer to the **last character** of the string

5 while left < right:

- Starts a loop that runs until both pointers meet in the middle

6 if text[left] != text[right]:

- Compares characters at the left and right pointers
- If they are not equal, the string is **not a palindrome**

7 return False

- Immediately exits the function if a mismatch is found

8 left += 1

- Moves the left pointer one step forward

9️⃣ **right -= 1**

- Moves the right pointer one step backward

🔟 **return True**

- If all character pairs match, the string is a palindrome