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Batch 04

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		**Assignment Type: Lab**	**Academic Year:**2025-2026
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CourseCode	23CS002PC304	**Course Title**	AI Assisted Coding
Year/Sem	III/II	**Regulation**	R23
Date and Day of Assignment	**Week1 – Tuesday**	**Time(s)**	23CSBTB01 To 23CSBTB52
Duration	2 Hours	**Applicable to Batches**	All batches
Assignment Number:1.3(Present assignment number)/**24**(Total number of assignments)			

Q.No.	Question	*Expected Time to*

		complete
1	Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI **Lab Objectives:** ✞ To explore and evaluate the functionality of Google Gemini for AIassisted coding within Google Colab. ✞ To understand and use Cursor AI for code generation, explanation, and refactoring. ✞ To compare outputs and usability between Gemini, GitHub Copilot, and Cursor AI. ✞ To perform code optimization and documentation using AI tools. **Lab Outcomes (LOs):** After completing this lab, students will be able to: ✞ Generate Python code using Google Gemini in Google Colab. ✞ Analyze the effectiveness of code explanations and suggestions by Gemini. ✞ Set up and use Cursor AI for AI-powered coding assistance. ✞ Evaluate and refactor code using Cursor AI features. Week1 - Monday ✞ Compare AI tool behavior and code quality across different platforms. **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: o Before/after list o Screenshot of Colab execution ✞ OUTPUT ✞ PROMPT: ✞ Write a python function to remove negative numbers from the list ✞ ✞	

```python
def remove_negative_numbers_simple(input_list):
    filtered_list = []
    for num in input_list:
        if num >= 0:
            filtered_list.append(num)
    return filtered_list


my_list = [1, -2, 3, -4, 5, 0, -10]
filtered_list = remove_negative_numbers_simple(my_list)
print(f"Original list: {my_list}")
print(f"List without negative numbers: {filtered_list}")
```

```
Original list: [1, -2, 3, -4, 5, 0, -10]
List without negative numbers: [1, 3, 5, 0]
```

Explanation:

- The function loops through each number in the input list.
- It checks if the number is 0 or positive.
- Only non-negative numbers are added to a new list.
- Finally, it returns the filtered list without negative values.

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

Output:

Prompt

Generate a python function that counts vowels constants and numbers in a string

```python
# Define a sample text
text = "This is a simple example of text analysis."

# Split the text into words using space as a delimiter
words = text.split()

# Count the number of words
word_count = len(words)

print(f"Original text: {text}")
print(f"Number of words: {word_count}")
```

Output for code

```
Original text: This is a simple example of text analysis.
Number of words: 8
```

Eplanation:

The function goes through each character in the given string.

If the character is a letter, it checks whether it is a vowel or a consonant.

If the character is a digit, it increases the digit count.

Finally, it returns the counts of vowels, consonants, and digits.

_____ 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

Output

	Prompt ***Generating palindrome code in git hub copilot , gemi***	

ni and comparison

```python
#generate python code for palidrome checking
def is_palindrome(s):
    """Check if a string is a palindrome."""
    cleaned_str = ''.join(c.lower() for c in s if c.isalnum())
    return cleaned_str == cleaned_str[::-1]

# Example usage
if __name__ == "__main__":
    test_strings = ["A man, a plan, a canal: Panama", "racecar", "hello", "No 'x' in Nixon"]
    for s in test_strings:
        result = is_palindrome(s)
        print(f'"{s}" is a palindrome: {result}')
```

```
PS C:\Ai_coding> & C:/Users/mukes/AppData/Local/Microsoft/WindowsApps/python3.13.exe c:/Ai_coding/day
_2.py
"A man, a plan, a canal: Panama" is a palindrome: True
"racecar" is a palindrome: True
"hello" is a palindrome: False
"No 'x' in Nixon" is a palindrome: True
PS C:\Ai_coding>
```

```python
def is_palindrome(text):
  cleaned_text = "".join(char.lower() for char in text if char.isalnum())
  return cleaned_text == cleaned_text[::-1]

print(f"'madam' is a palindrome: {is_palindrome('madam')}")
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')}")
```

Output for code

```
'madam' is a palindrome: True
'racecar' is a palindrome: True
'hello' is a palindrome: False
'Python' is a palindrome: False
```

Eplanation:

Step-by-step comparison of both palindrome codes:

Function Definition:

Both codes define a function named is_palindrome that takes a string as input.

Text Cleaning:

	In both codes, the input string is converted to lowercase and all nonalphanumeric characters are removed to ensure accurate palindrome	

checking.

Palindrome Logic:
Each code compares the cleaned string with its reverse using string slicing ([::-1]) to determine if it is a palindrome.

Return Value:
Both functions return True if the string is a palindrome and False otherwise.

Testing the Function:
The first code directly calls the function with print() statements, while the second code tests multiple strings inside an if __name__ == "__main__" block.

Code Structure:
The first code is simple and straightforward, whereas the second code is better structured, includes a docstring, and is more suitable for larger programs.

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

Output

prompt

generate a python code for prime number explain line by line

```python
# A list of numbers that might be processed in unfamiliar code
my_list = [1, -2, 3, -4, 5, 0, -10]

# Filter the list to keep only positive numbers (including zero in this case)
# This helps to understand data transformation logic
filtered_list = [x for x in my_list if x >= 0]

print(f"Original list: {my_list}")
print(f"Filtered list (non-negative numbers): {filtered_list}")
```

Output for code

```
Original list: [1, -2, 3, -4, 5, 0, -10]
Filtered list (non-negative numbers): [1, 3, 5, 0]
```

Explanation:

Step-by-step execution explanation for `is_prime(number)` function:

Let's trace `is_prime(7)`:

1. `def is_prime(number):`: The function `is_prime` is called with `number = 7`.
2. `if number <= 1:`: `7 <= 1` is `False`. So, this condition is skipped.
3. `for i in range(2, int(number**0.5) + 1):`: The loop starts. `number**0.5` (square root of 7) is approximately `2.64`. `int(2.64)` is `2`. So the range is `range(2, 2 + 1)`, which means `range(2, 3)`. The loop will run for `i = 2`.
4. `i = 2` **(first iteration of the loop)**:
   - `if number % i == 0:`: `7 % 2` (7 divided by 2) is `1` (remainder is 1). `1 == 0` is `False`. So, this condition is skipped.
5. The loop finishes because `i` reached the end of the range.
6. `return True`: Since no divisor was found, the function returns `True`.

Thus, `is_prime(7)` correctly returns `True`.

Let's trace `is_prime(10)`:

1. `def is_prime(number):`: The function `is_prime` is called with `number = 10`.
2. `if number <= 1:`: `10 <= 1` is `False`. So, this condition is skipped.
3. `for i in range(2, int(number**0.5) + 1):`: The loop starts. `number**0.5` (square root of 10) is approximately `3.16`. `int(3.16)` is `3`. So the range is `range(2, 3 + 1)`, which means `range(2, 4)`. The loop will run for `i = 2, 3`.
4. `i = 2` **(first iteration of the loop)**:
   - `if number % i == 0:`: `10 % 2` (10 divided by 2) is `0` (remainder is 0). `0 == 0` is `True`. So, this condition is met.
   - `return False`: The function immediately returns `False` because a divisor (2) was found.

Thus, `is_prime(10)` correctly returns `False`.

Note: Report should be submitted as a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots.