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BATCH 47

<b>SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE</b>		<b>DEPARTMENT OF COMPUTER SCIENCE ENGINEERING</b>	
<b>Program Name:</b> B. Tech		<b>Assignment Type:</b> Lab	<b>Academic Year:</b> 2025-2026
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<b>CourseCode</b>	23CS002PC304	<b>Course Title</b>	AI Assisted Coding
<b>Year/Sem</b>	III/II	<b>Regulation</b>	R23
<b>Date and Day of Assignment</b>	Week1 – Monday	<b>Time(s)</b>	23CSBTB01 To 23CSBTB52
<b>Duration</b>	2 Hours	<b>Applicable to Batches</b>	All batches
<b>Assignment Number:</b> 1.3(Present assignment number)/24(Total number of assignments)			
<b>Q.No.</b>	<b>Question</b>		<b>Expected Time to complete</b>

1	<p>Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI</p> <p><b>Lab Objectives:</b></p> <ul style="list-style-type: none"> <li>❖ To explore and evaluate the functionality of Google Gemini for AI-assisted coding within Google Colab.</li> <li>❖ To understand and use Cursor AI for code generation, explanation, and refactoring.</li> <li>❖ To compare outputs and usability between Gemini, GitHub Copilot, and Cursor AI.</li> <li>❖ To perform code optimization and documentation using AI tools.</li> </ul> <p><b>Lab Outcomes (LOs):</b> After completing this lab, students will be able to:</p> <ul style="list-style-type: none"> <li>❖ Generate Python code using Google Gemini in Google Colab.</li> <li>❖ Analyze the effectiveness of code explanations and suggestions by Gemini.</li> <li>❖ Set up and use Cursor AI for AI-powered coding assistance.</li> <li>❖ Evaluate and refactor code using Cursor AI features.</li> <li>❖ Compare AI tool behavior and code quality across different platforms.</li> </ul> <hr/> <p><b>Task 1: Statistical Summary for Survey Data</b></p> <ul style="list-style-type: none"> <li>❖ <b>Scenario:</b> You are a <b>data analyst intern</b> working with survey responses stored as numerical lists.</li> <li>❖ <b>Task:</b> Use <b>Google Gemini in Colab</b> to generate a Python function that reads a list of numbers and calculates the <b>mean, minimum, and maximum</b> values.</li> <li>❖ <b>Expected Output:</b> <ul style="list-style-type: none"> <li>➤ Correct Python function</li> <li>➤ Output shown in Colab</li> <li>➤ Screenshot of Gemini prompt and result</li> </ul> </li> </ul> <p><b>Question:</b></p> <p>Write a Python program to check whether a given number is an Armstrong number using user input and clear logic.</p> <p><b>Code:</b></p>	Week1 - Monday
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```
def is_armstrong_number(num):
    num_str = str(num)
    num_digits = len(num_str)
    sum_of_powers = sum(int(digit) ** num_digits for digit in num_str)
    return sum_of_powers == num
```

Output:

```
True
```

```
=== Code Execution Successful ===
```

## Task 2: Armstrong Number – AI Comparison

### ❖ Scenario:

You are evaluating AI tools for numeric validation logic.

### ❖ Task:

Generate an **Armstrong number checker** using **Gemini** and **GitHub Copilot**.

Compare their outputs, logic style, and clarity.

### ❖ Expected Output:

- Side-by-side comparison table
- Screenshots of prompts and generated code

### Question:

Write a Python program using if-else conditions to check whether a given year is a leap year.

Code:

```
def is_leap_year(year):
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
        return True
    else:
        return False
n= int(input("enter the year: "))
ans=(is_leap_year(n))
if ans :
    print(f"{n} is a leap year")
else :
    print(f"{n} is not a leap year")
```

**Output:**

```
● enter the year: 2020
2020 is a leap year
C:\PS C:\Users\telio\OneDrive\Desktop\AT>
```

### Task 3: Leap Year Validation Using Cursor AI

❖ **Scenario:**

You are validating a calendar module for a backend system.

❖ **Task:**

Use **Cursor AI** to generate a Python program that checks whether a given year is a leap year.

Use **at least two different prompts** and observe changes in code.

❖ **Expected Output:**

- Two versions of code
- Sample inputs/outputs
- Brief comparison

**Question:**

Write an optimized Python function that returns True or False to check whether a year is a leap year.

**Code:**

```
def is_leap_year_optimized(year):
    return year % 4 == 0 and (year % 100 != 0 or year % 400 == 0)

year = int(input())
if is_leap_year_optimized(year):
    print("Leap Year")
else:
    print("Not a Leap Year")
```

**Output:**

```
2016
Leap Year
```

#### Task 4: Student Logic + AI Refactoring (Odd/Even Sum)

❖ **Scenario:**

Company policy requires developers to write logic before using AI.

❖ **Task:**

Write a Python program that calculates the **sum of odd and even numbers in a tuple**, then refactor it using any AI tool.

❖ **Expected Output:**

- Original code
- Refactored code
- Explanation of improvements

Question:

Write a Python program to calculate the sum of even and odd numbers in a tuple without advanced functions

Code:

```
def sum_even_odd(numbers):  
    sum_even = sum(num for num in numbers if num % 2 == 0)  
    sum_odd = sum(num for num in numbers if num % 2 != 0)  
    return sum_even, sum_odd  
  
numbers = list(map(int, input("enter the number: ").split()))  
even, odd = sum_even_odd(numbers)  
print(even, odd)
```

Output:

```
enter the number: 1 2 5 6 9 87 46 3 51  
54 156  
PS C:\Users\telie\OneDrive\Desktop\AT>
```