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 Batch - 46

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		Assignment Type: Lab	
Course Coordinator Name		Dr. Rishabh Mittal	
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CourseCode	23CS002PC304	Course Title	AI Assisted Coding
Year/Sem	III/II	Regulation	R23
Date and Day of Assignment	Week1 – Monday	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	<p>Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI</p> <p>Lab Objectives:</p> <ul style="list-style-type: none"> ❖ To explore and evaluate the functionality of Google Gemini for AI-assisted 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. <p>Lab Outcomes (LOs):</p> <p>After completing this lab, students will be able to:</p> <ul style="list-style-type: none"> ❖ 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. ❖ Compare AI tool behavior and code quality across different platforms. 	
	<p>Task 1: Statistical Summary for Survey Data</p> <p>❖ Scenario: You are a data analyst intern working with survey responses stored as numerical lists.</p> <p>❖ Task: Use Google Gemini in Colab to generate a Python function that reads a list of numbers and calculates the mean, minimum, and maximum values.</p> <p>❖ Expected Output:</p> <ul style="list-style-type: none"> ➢ Correct Python function ➢ Output shown in Colab ➢ Screenshot of Gemini prompt and result <p>Question:</p> <p>Write a Python program to check whether a given number is an Armstrong number using user input and clear logic.</p> <p>Code:</p>	Week1 - Monday

```
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
○ PS C:\Users\telie\OneDrive\Desktop\AI>
```

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>
```