

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
<b>Program Name:</b> B. Tech		<b>Assignment Type:</b> Lab	
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<b>Course Code</b>	23CS002PC304	<b>Course Title</b>	AI Assisted Coding
<b>Year/Sem</b>	III/I	<b>Regulation</b>	R23
<b>Date and Day of Assignment</b>	Week 2 - Wednesday	<b>Time(s)</b>	23CSBTB01 To 23CSBTB52
<b>Duration</b>	2 Hours	<b>Applicable to Batches</b>	All batches
<b>Assignment Number:</b> 3.3(Present assignment number)/24(Total number of assignments)			
Q . N o . .	<b>Question</b>		<b>Expected Time to complete</b>
1	<b>Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques</b>  <b>Lab Objectives</b> <ul style="list-style-type: none"> <li>• To explore and apply different levels of prompt examples in AI-assisted code generation</li> <li>• To understand how zero-shot, one-shot, and few-shot prompting affect AI output quality</li> <li>• To evaluate the impact of context richness and example quantity on AI performance</li> <li>• To build awareness of prompt strategy effectiveness for different problem types</li> </ul>		Week2 - Wednesday

**Lab Outcomes (LOs)****After completing this lab, students will be able to:**

- Use zero-shot prompting to instruct AI with minimal context
- Use one-shot prompting with a single example to guide AI code generation
- Apply few-shot prompting using multiple examples to improve AI responses
- Compare AI outputs across different prompting strategies

**Task 1: Zero-Shot Prompting – Leap Year Check****Scenario**

Zero-shot prompting involves giving instructions without providing examples.

**Task Description**

Use zero-shot prompting to instruct an AI tool to generate a Python function that:

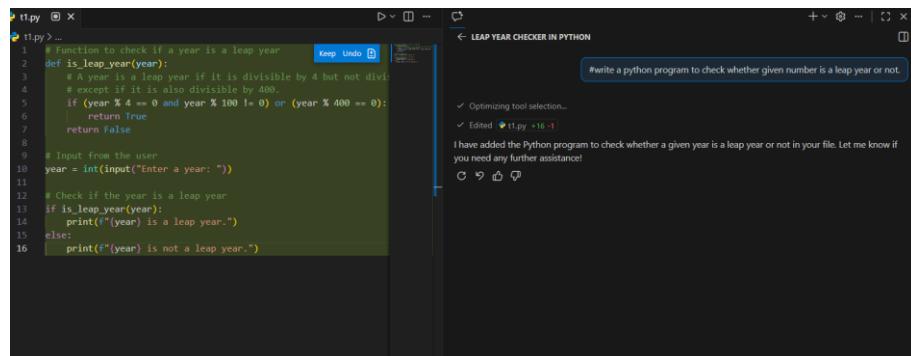
- Accepts a year as input
- Checks whether the given year is a leap year
- Returns an appropriate result

**Note:** No input-output examples should be provided in the prompt.**Expected Output**

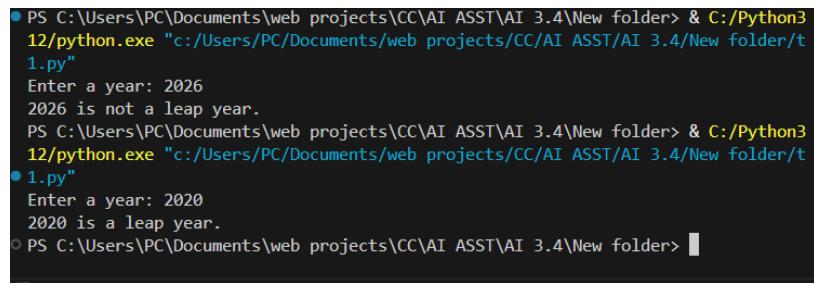
- AI-generated leap year checking function
- Correct logical conditions
- Sample input and output
- Screenshot of AI-generated response (if required)

**Prompt:**

#write a python program to check whether given number is a leap year or not.



```
t1.py
1 # Function to check if a year is a leap year
2 def is_leap_year(year):
3     # A year is a leap year if it is divisible by 4 but not divisible by 100, or if it is also divisible by 400.
4     if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
5         return True
6     return False
7
8
9 # Input from the user
10 year = int(input("Enter a year: "))
11
12 # Check if the year is a leap year
13 if is_leap_year(year):
14     print(f"{year} is a leap year.")
15 else:
16     print(f"{year} is not a leap year.")
```



```
PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4\New folder> & C:/Python312/python.exe "c:/Users/PC/Documents/web projects/CC/AI ASST/AI 3.4/New folder/t1.py"
Enter a year: 2026
2026 is not a leap year.
PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4\New folder> & C:/Python312/python.exe "c:/Users/PC/Documents/web projects/CC/AI ASST/AI 3.4/New folder/t1.py"
Enter a year: 2020
2020 is a leap year.
PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4\New folder>
```

**Observation**

Even without examples, the AI correctly:

- Applied leap year rules
- Used logical operators properly
- Returned accurate results

This shows that **zero-shot prompting works well for well-known logical problems.**

## Task 2: One-Shot Prompting – Centimeters to Inches Conversion

### Scenario

One-shot prompting guides AI using a single example.

### Task Description

Use one-shot prompting by providing one input-output example to generate a Python function that:

- Converts centimeters to inches
- Uses the correct mathematical formula

### Example provided in prompt:

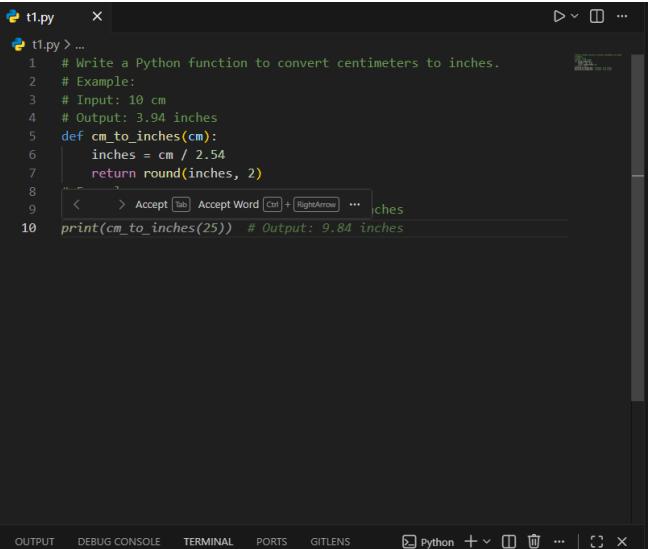
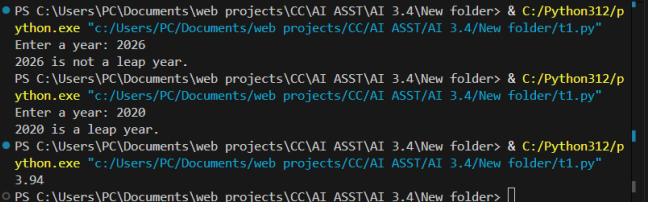
Input: 10 cm → Output: 3.94 inches

### Expected Output

- Python function with correct conversion logic
  - Accurate calculation
- 
- Sample test cases and outputs

### Prompt

Write a py program to convert cm to inches.

- 
- 

### Task 3: Few-Shot Prompting – Name Formatting

#### Scenario

Few-shot prompting improves accuracy by providing multiple examples.

#### Task Description

Use few-shot prompting with 2–3 examples to generate a Python function that:

- Accepts a full name as input
- Formats it as “Last, First”

#### Example formats:

- "John Smith" → "Smith, John"
- "Anita Rao" → "Rao, Anita"

#### Expected Output

- Well-structured Python function
- Output strictly following example patterns
- Correct handling of names
- Sample inputs and outputs
- Prompt

write a program for to take first and last name as input and return last name and first name with expected .

```
# input  
John , kiran  
#output  
Kiran, John
```

```
t1.py > ...  
1 # Function to swap first and last name  
2 def swap_names(first_name, last_name):  
3     return (*last_name.capitalize(), *first_name.capitalize())  
4  
5 # Input from the user  
6 first_name = input("Enter the first name: ")  
7 last_name = input("Enter the last name: ")  
8  
9 # Get the swapped names  
10 result = swap_names(first_name, last_name)  
11 print("Swapped names:", result)
```

I have added the Python program to check whether a given year is a leap year or not in your file. Let me know if you need any further assistance!

input

John , kiran  
#output  
Kiran, John

✓ Edited t1.py +1/-1

I have added the Python program to take the first and last name as input and return them in the format "LastName, FirstName". Let me know if you need further assistance!

```
PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4\New folder> & C:/Python312/p  
yton.exe "c:/Users/PC/Documents/web projects/CC/AI ASST/AI 3.4/New folder/t1.py"  
Enter the first name: john  
Enter the last name: alice  
Swapped names: Alice, John  
PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4\New folder>
```

### Task 4: Comparative Analysis – Zero-Shot vs Few-Shot

#### Scenario

Different prompt strategies may produce different code quality.

#### Task Description

- Use zero-shot prompting to generate a function that counts vowels in a string
- Use few-shot prompting for the same problem

- Compare both outputs based on:
    - Accuracy
    - Readability
    - Logical clarity

## **Expected Output**

- Two vowel-counting functions
  - Comparison table or short reflection paragraph
  - Conclusion on prompt effectiveness

## Prompt

Write a Python function to count vowels in a string.

Examples:

"hello" → 2

"Python" → 1

The screenshot shows a Jupyter Notebook interface with two code cells. The first cell contains a Python script named '1.py' which defines a function to swap names and another to count vowels. The second cell is titled 'LEAP YEAR CHECKER IN PYTHON' and contains a simple example of checking if 'hello' is a leap year, resulting in 'True'. Below the cells, there's a message from the user asking for further assistance.

```
ipython>_
1 # Function to swap first and last name
2 def swap_names(first_name, last_name):
3     return f"({last_name.capitalize()}), {first_name.capitalize()}"
4
5 # Function to count vowels in a string
6 def count_vowels(input_string):
7     vowels = "aeiouAEIOU"
8     count = sum(1 for char in input_string if char in vowels)
9     return count
10
11 # Input from the user
12 first_name = input("Enter the first name: ")
13 last_name = input("Enter the last name: ")
14
15 # Get the swapped names
16 result = swap_names(first_name, last_name)
17 print(f"Swapped names: {result}")
18 ⌘ Chat (CTRL + I) / Share (CTRL + L)
19 Example usage
20 example_string = input("Enter a string: ")
21 vowel_count = count_vowels(example_string)
22 print(f"The number of vowels in the string is: {vowel_count}")

----->
Keep Undo ⌛ | 1 of 1 ⌂

LEAP YEAR CHECKER IN PYTHON
Write a Python function to count vowels in a string.

Examples:
"hello" → 2
"Python" → 1

✓ Edited 1.py +11 ↴
I have added a Python function to count the number of vowels in a given string. Let me know if you need any further modifications or assistance!
```

```
● PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4>New folder> & C:/Python312/python.exe "C:/Users/PC/Documents/web projects/CC/AI ASST/AI 3.4/New folder/t1.py"
Enter the first name: annakkk
Enter the last name: jsjwi
Swapped names: Jsjwi, Annaakkk
Enter a string: jdqnnndnqxq
The number of vowels in the string is: 0
○ PS C:\Users\PC\Documents\web projects\CC\AI ASST\AI 3.4>New folder>
```

## Task 5: Few-Shot Prompting – File Handling

## Scenario

File processing requires clear logical understanding.

## Task Description

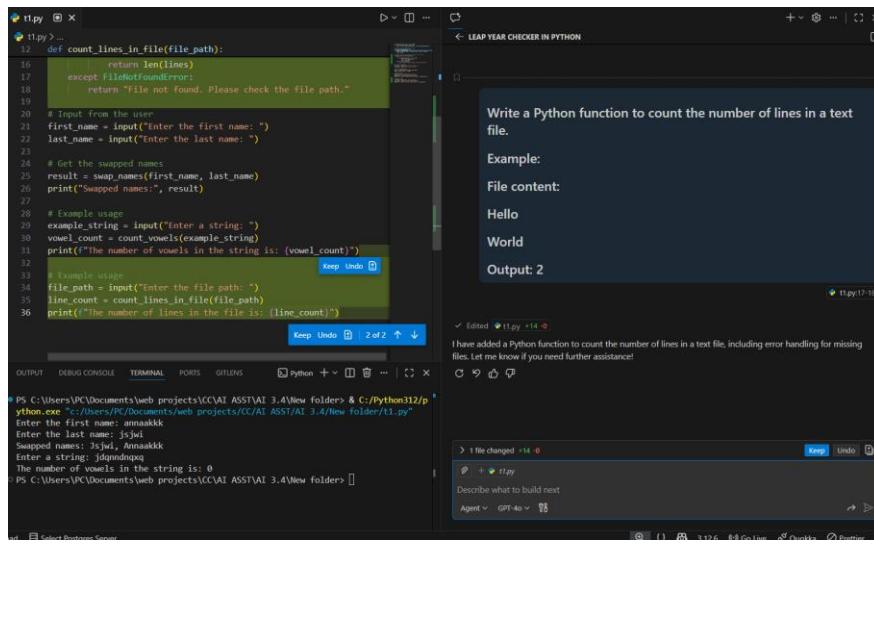
Use few-shot prompting to generate a Python function that:

- Reads a .txt file
- Counts the number of lines in the file
- Returns the line count

#### Expected Output

- Working Python file-processing function
- Correct line count
- Sample .txt input and output
- AI-assisted logic explanation

**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.



```

t1.py ② x
t1.py > ...
12 def count_lines_in_file(file_path):
13     lines = []
14     try:
15         with open(file_path) as f:
16             return len(lines)
17     except FileNotFoundError:
18         return "File not found. Please check the file path."
19
20 # Input from the user
21 first_name = input("Enter the first name: ")
22 last_name = input("Enter the last name: ")
23
24 # Get the swapped names
25 result = swap_names(first_name, last_name)
26 print("Swapped names:", result)
27
28 # Example usage
29 example_string = input("Enter a string: ")
30 vowel_count = count_vowels(example_string)
31 print(f"The number of vowels in the string is: {vowel_count}")
32
33 # Example usage
34 file_path = input("Enter the file path: ")
35 line_count = count_lines_in_file(file_path)
36 print(f"The number of lines in the file is: {line_count}")

Keep Undo ④ 2 of 2 ↑ ↓
OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS Python + v ⌂ ... | ⌂ x

PS C:\Users\PC\Documents\web projects\CCVAI ASSTVAI 3.4\New folders & C:/Python312/p
python.exe "c:/Users/PC/Documents/web projects/CC/Al ASST/Al 3.4/New folder/t1.py"
Enter the first name: jshdkkkk
Enter the last name: jshd
Swapped names: jshd, jshdkkkk
Enter a string: jdqndnpxq
The number of vowels in the string is: 0
PS C:\Users\PC\Documents\web projects\CCVAI ASSTVAI 3.4\New folders>

```

Write a Python function to count the number of lines in a text file.

Example:

File content:

Hello

World

Output: 2

I have added a Python function to count the number of lines in a text file, including error handling for missing files. Let me know if you need further assistance!

Keep Undo ④ 2 of 2 ↑ ↓

Describe what to build next

Agent v GPT-4o