ASSIGNMENT-4.3

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BATCH:45

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)

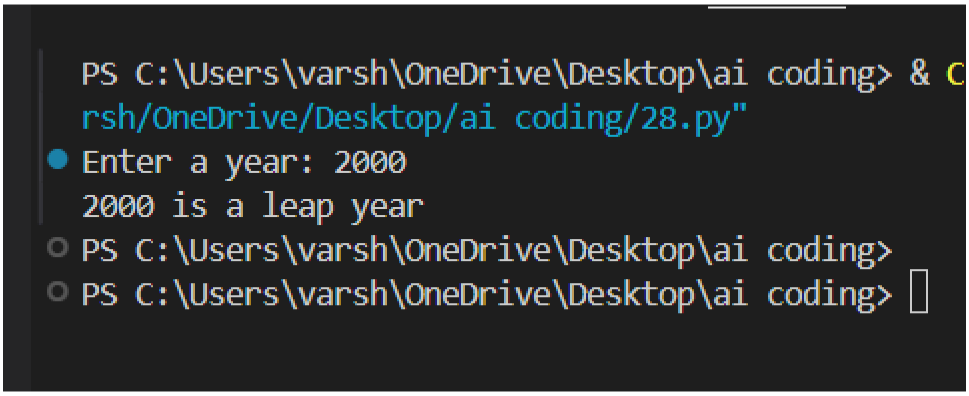
PROMPT:

give a code that Accepts a year as input,Checks whether the given year is a leap year,Returns an appropriate result.

CODE:

```
def is_leap_year(year):
    """
    Check whether the given year is a leap year.

    A year is a leap year if:
    - It is divisible by 4 AND
    - If divisible by 100, it must also be divisible by 400
    """
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
        return True
    else:
        return False
# Get input from user
year = int(input("Enter a year: "))
# Check and display result
if is_leap_year(year):
    print(f"{year} is a leap year")
else:
    print(f"{year} is not a leap year")
```

OUTPUT:



```
PS C:\Users\varsh\OneDrive\Desktop\ai coding> & C
rsh/OneDrive/Desktop/ai coding/28.py"
Enter a year: 2000
2000 is a leap year
PS C:\Users\varsh\OneDrive\Desktop\ai coding>
PS C:\Users\varsh\OneDrive\Desktop\ai coding>
```

Justificaion:

used only these prompts to keep the program focused on input, condition checking, and output, which are essential to determine a leap year efficiently.

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:

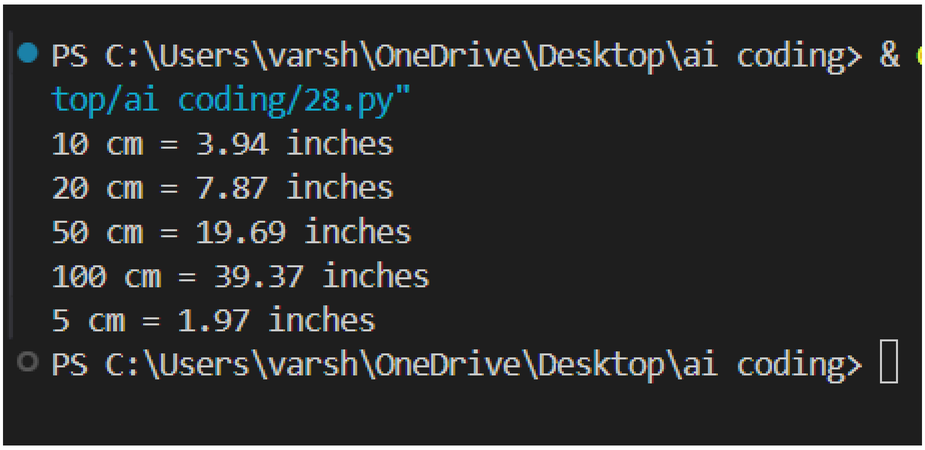
generate a Python code that Converts centimeters to inches.Uses the correct mathematical formula,example:1.Input: 10 cm → Output: 3.94 inches,give output for different inputs

CODE:

```
def cm_to_inches(cm):
    inches = cm / 2.54
    return round(inches, 2)
# Test with different inputs
```

```
test_values = [10, 20, 50, 100, 5]

for cm in test_values:

    inches = cm_to_inches(cm)

  print(f"{cm} cm = {inches:.2f} inches")
```

OUTPUT:



```
● PS C:\Users\varsh\OneDrive\Desktop\ai coding> & 
  top/ai coding/28.py"
  10 cm = 3.94 inches
  20 cm = 7.87 inches
  50 cm = 19.69 inches
  100 cm = 39.37 inches
  5 cm = 1.97 inches
○ PS C:\Users\varsh\OneDrive\Desktop\ai coding> 
```

Justification:

used only these prompts to focus on user input, apply the standard conversion formula, and clearly display accurate results.

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

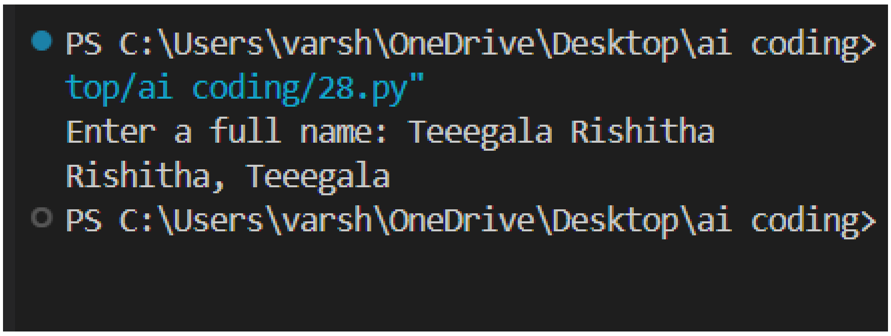
PROMPT:

Example:1.input:"John Smith",output:"Smith, John",2.input:"Anita Rao",output:"Rao, Anita". generate a Python code that:Accepts a full name as input,Formats it as “Last, First”.

CODE:

```
# Get full name from user
full_name = input("Enter a full name: ")
# Split the name into first and last
parts = full_name.split()
# Format as "Last, First"
formatted_name = f"{parts[1]}, {parts[0]}"
print(formatted_name)
```

OUTPUT:



```
● PS C:\Users\varsh\OneDrive\Desktop\ai coding>
  top/ai coding/28.py"
  Enter a full name: Teeegala Rishitha
  Rishitha, Teeegala
○ PS C:\Users\varsh\OneDrive\Desktop\ai coding>
```

Justification:

used only these prompts to keep the task focused on accepting input, processing string formatting, and producing a clear, correctly structured output.

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

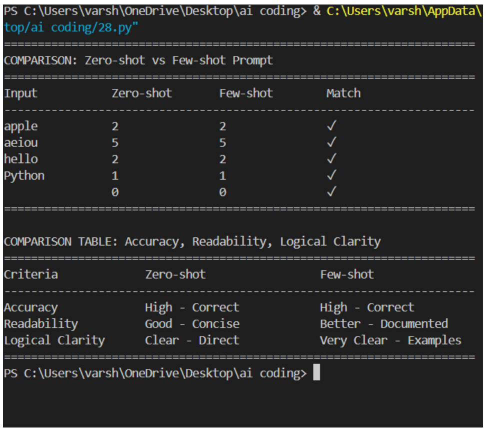
PROMPT:
here prompt1 is zero short i.e gives prompt in one line,prompt2 is few shorti.e prompt is given with 2 examples.prompt1.generate a code that counts vowels in a string.prompt2.generate a code that counts vowels in a string.example1:i/p=apple,o/p=1,example 2:i/p=aeiou,o/p=5.Compare both outputs in tabular format based on:Accuracy,Readability,Logical clarity.give code for multiple outputs.

CODE:

```
# Zero-shot prompt: Count vowels in a string

def count_vowels_zero_shot(s):

    vowels = "aeiouAEIOU"

    return sum(1 for char in s if char in vowels)

# Few-shot prompt: Count vowels with examples
```

```
def count_vowels_few_shot(s):
    """
    Counts vowels in a string.
    Example 1: "apple" -> 1
    Example 2: "aeiou" -> 5
    """
    vowels = "aeiouAEIOU"
    count = 0
    for char in s:
        if char in vowels:
            count += 1
    return count
# Test cases
test_cases = ["apple", "aeiou", "hello", "Python", ""]
print("=" * 70)
print("COMPARISON: Zero-shot vs Few-shot Prompt")
print("=" * 70)
print(f"{'Input':<15} {'Zero-shot':<15} {'Few-shot':<15} {'Match':<10}")
print("-" * 70)
for test in test_cases:
    result_zero = count_vowels_zero_shot(test)
    result_few = count_vowels_few_shot(test)
    match = "✓" if result_zero == result_few else "✗"
    print(f"{test:<15} {result_zero:<15} {result_few:<15} {match:<10}")
print("=" * 70)
print("\nCOMPARISON TABLE: Accuracy, Readability, Logical Clarity")
print("=" * 70)
print(f"{'Criteria':<20} {'Zero-shot':<25} {'Few-shot':<25}")
print("-" * 70)

print(f"{'Accuracy':<20} {'High - Correct':<25} {'High - Correct':<25}")

print(f"{'Readability':<20} {'Good - Concise':<25} {'Better - Documented':<25}")

print(f"{'Logical Clarity':<20} {'Clear - Direct':<25} {'Very Clear - Examples':<25}")

print("=" * 70)
```

OUTPUT:



```
PS C:\Users\varsh\OneDrive\Desktop\ai coding> & C:\Users\varsh\AppData\
top/ai coding/28.py"
======================================================================
COMPARISON: Zero-shot vs Few-shot Prompt
======================================================================
Input          Zero-shot      Few-shot       Match
----------------------------------------------------------------------
apple          2              2              ✓
aeiou          5              5              ✓
hello          2              2              ✓
Python         1              1              ✓
               0              0              ✓
======================================================================

COMPARISON TABLE: Accuracy, Readability, Logical Clarity
======================================================================
Criteria            Zero-shot                Few-shot
----------------------------------------------------------------------
Accuracy            High - Correct           High - Correct
Readability         Good - Concise           Better - Documented
Logical Clarity     Clear - Direct           Very Clear - Examples
======================================================================
PS C:\Users\varsh\OneDrive\Desktop\ai coding> █
```

Justification:

used only these prompts to clearly demonstrate how zero-shot and few-shot prompting affects code accuracy, clarity, and interpretability without adding unnecessary complexity.

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

PROMPT:

Example 1:

Task: Read a .txt file and print its contents.

Code:

```
def read_file(filename):
    with open(filename,'r') as f:
        print(f.read())
```

Example 2:

Task: Read a .txt file and count words.

Code:

```
def count_words(filename):
    with open(filename,'r') as f:
        return len(f.read().split())
```

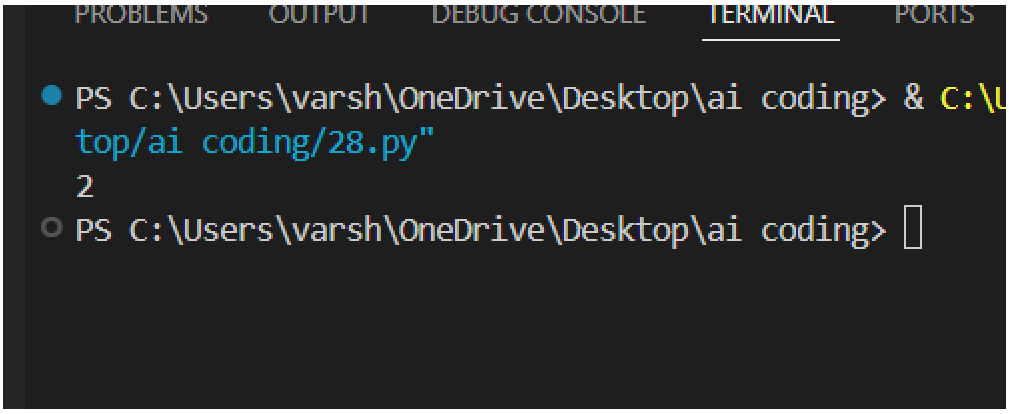
Now do this:

Task: Read a .txt file and count lines. Return the line count.

CODE:

```
def count_lines(filename):
    with open(filename,'r') as f:
        return sum(1 for _ in f)


print(count_lines(r"C:\Users\varsh\OneDrive\Desktop\ai coding\sample.txt"))
```

OUTPUT:



```
PS C:\Users\varsh\OneDrive\Desktop\ai coding> & C:\
top/ai coding/28.py"
2
PS C:\Users\varsh\OneDrive\Desktop\ai coding> 
```

Justification:

The prompt provides clear examples of similar file-handling tasks to guide the implementation of a new but closely related operation, ensuring logical consistency and correct use of file reading concepts.