

4.3 Assignment

Ht.no:2303A51132

Batch:17

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:- #Generate a Python function that accepts a year as input and determines whether the given year is a leap year or not. The function should apply the correct

leap year rules and return an appropriate result with user input

```
Code:-      def
is_leap_year(year):
    """Determine whether a given year is a leap year. A year is a leap year if it is
    divisible by 4, except for end-of-century years, which must be divisible by 400.
    Args:
        year (int): The year to check.
    Returns:
        bool: True if the year is a leap year, False otherwise. """
    if (year %
        4 == 0 and year % 100 != 0) or (year % 400 == 0): return True
    else:
        return False # Example usage:

year_input = int(input("Enter a year: "))
if is_leap_year(year_input):
    print(f"{year_input} is a leap year.")
else:
    print(f"{year_input} is not a leap year.")
```

Output:-

Analysis:- The program is logically correct, efficient, and well-structured. It effectively demonstrates zero-shot AI code generation by correctly implementing leap year rules and handling user input to produce accurate results.

• 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 function that converts centimeters to inches using the correct mathematical formula. with user input.

Code:-

```
def cm_to_inches():  
    # Get user input  
    cm = float(input("Enter length in centimeters: "))  
    # Conversion factor  
    inches_per_cm = 0.393701  
    # Convert centimeters to inches  
    inches = cm * inches_per_cm  
    # Display the result  
    print(f"{cm} centimeters is equal to {inches} inches.")  
# Call the function  
cm_to_inches()
```

Output:-

Analysis:- The program correctly implements a **one-shot prompted AI solution** to convert centimeters into inches. It applies the correct formula, handles user input efficiently, and produces accurate output, fulfilling all task requirements.

• 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:- #Generate a Python function that takes a full name as input and formats it as ‘Last, First with user input.

```
Code:- def format_name(full_name): # Split the full name into parts
name_parts = full_name.split()

# Check if there are at least two parts (first and last name)
if len(name_parts) < 2:
    return "Please provide both first and last names."

# Extract the first and last names
first_name = name_parts[0]
last_name = name_parts[-1]

# Format the name as 'Last, First'
formatted_name = f'{last_name}, {first_name}'
return formatted_name

# Get user input
user_input = input("Enter your full name: ")
# Format the name and print the result formatted =
format_name(user_input)
print("Formatted Name:", formatted)
```

Output:-

Analysis:- This task demonstrates **few-shot prompting**, where multiple examples guide the AI to generate accurate and consistent output. The program successfully formats names into the required “**Last, First**” structure while handling different name inputs correctly.

• 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:-#Generate a Python function that counts the number of vowels in a given string and returns the count with user input.

```
Code:- def count_vowels(input_string):
    vowels = "aeiouAEIOU"
    count = 0
    for char in input_string:
        if char in vowels:
            count += 1
    return count

# Get user input
user_input = input("Enter a string: ")

vowel_count = count_vowels(user_input)
print(f"The number of vowels in the given string is: {vowel_count}")
```

Output:-

Analysis:- In **zero-shot prompting**, the AI is given only the task description without any examples. As a result, the generated vowel-counting function is

logically correct and easy to understand, but it follows a more basic and verbose approach using loops and counters. This makes the code beginner-friendly, though slightly longer.

5.

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:- #Generate a Python function that reads a text file and counts the number of lines in it. with user input.

Code:-

```
def count_lines_in_file():  
    file_path = input("Please enter the path to the text file: ")  
    try:  
        with open(file_path, 'r') as file:  
            lines = file.readlines()  
            line_count = len(lines)  
        print(f"The number of lines in the file is: {line_count}")  
    except FileNotFoundError:  
        print("The file was not found. Please check the path and try  
again.")  
    except Exception as e:  
        print(f"An error occurred: {e}")  
  
# Call the function count_lines_in_file()
```

Output:-

Analysis:- Saving the text file (sample.txt) in the **Downloads folder** is perfectly acceptable. Any valid .txt file stored anywhere on the system can be used, as long as the **correct file path** is provided to the program. By entering the full path of the file, Python can accurately locate, open, and read the file contents.