Name: Gutha Srinidhi

H.No: 2303A53023 - B46

ASSIGNMENT-4.3

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 Prompt used :

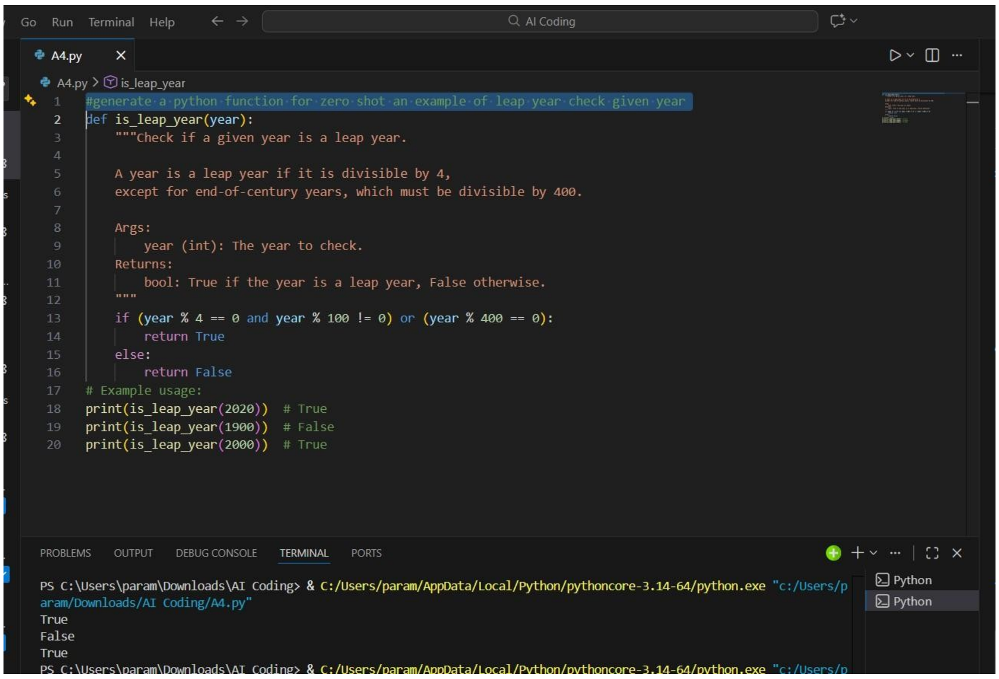
#Generate a python function for zero shot an example of leap year check given

year

Code:

```
def is_leap_year(year):
   if (year % 400 == 0) or (year % 4 == 0 and year % 100 !=
      0): return True
else:
      return False
```

Output:



```python
#generate a python function for zero shot an example of leap year check given year
def is_leap_year(year):
    """Check if 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:
print(is_leap_year(2020))  # True
print(is_leap_year(1900))  # False
print(is_leap_year(2000))  # True
```

```
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/p
aram/Downloads/AI Coding/A4.py"
True
False
True
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/p
```

Explaination : 1) The function is_leap_year(year) takes a **year** as input.

2) % (modulus operator) checks divisibility.

3) If the year is:

- divisible by **400**, it is a leap year **OR**
- divisible by **4** and **not divisible by 100**, it is a leap year 4) If the condition is satisfied, the function returns **True**.

5) Otherwise, it returns **False**.

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

PROMPT USED :

#Generate a Python function that converts centimeters to inches.

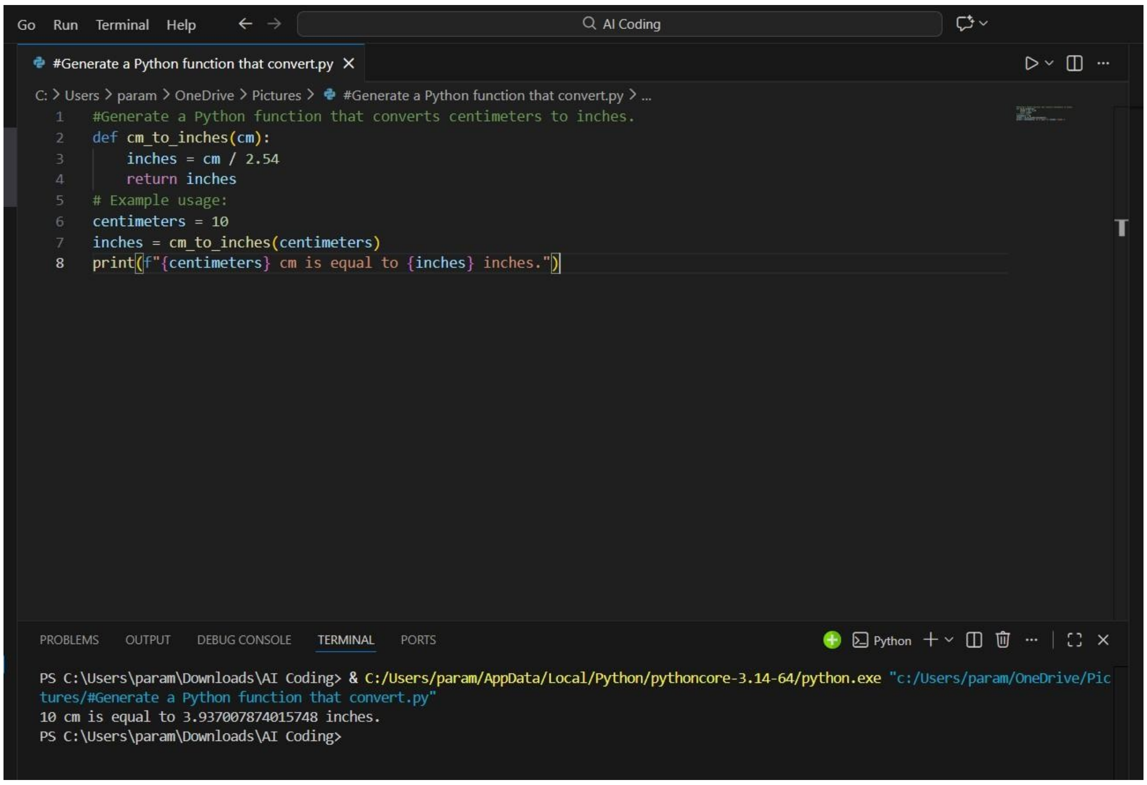
Code :

def cm_to_inches(cm):

  # 1 inch = 2.54 centimeters

inches = cm / 2.54   return

round(inches, 2) Output :



Go
Run
Terminal
Help
AI Coding
#Generate a Python function that convert.py
C: > Users > param > OneDrive > Pictures > #Generate a Python function that convert.py > ...
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Python

```python
#Generate a Python function that converts centimeters to inches.
def cm_to_inches(cm):
    inches = cm / 2.54
    return inches
# Example usage:
centimeters = 10
inches = cm_to_inches(centimeters)
print(f"{centimeters} cm is equal to {inches} inches.")
```

```
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/param/OneDrive/Pictures/#Generate a Python function that convert.py"
10 cm is equal to 3.937007874015748 inches.
PS C:\Users\param\Downloads\AI Coding>
```

Explaination:

- The function cm_to_inches(cm) takes a value in centimeters.
- The conversion formula used is:
- inches = centimeters / 2.54
- round(inches, 2) rounds the result to 2 decimal places.

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

Prompt used : Generate a Python function that accepts a full name as input and formats it in the form **“Last, First”**.

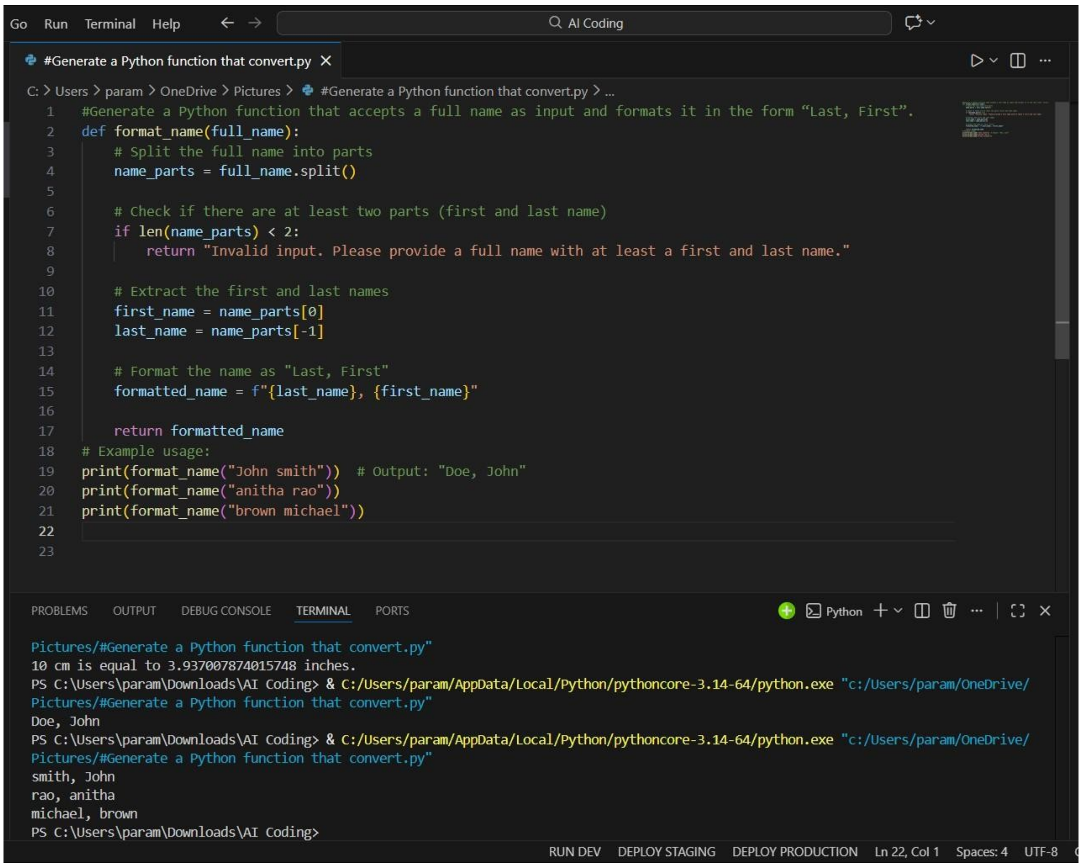
Code :

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


   # First name is the first part, last name is the last part
first_name = parts[0]     last_name = parts[-1]


   # Format as "Last, First"     return
f"{last_name}, {first_name}"
```

output:


Go Run Terminal Help
AI Coding
#Generate a Python function that convert.py
C: > Users > param > OneDrive > Pictures > #Generate a Python function that convert.py > ...
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Python
RUN DEV DEPLOY STAGING DEPLOY PRODUCTION Ln 22, Col 1 Spaces: 4 UTF-8

```python
#Generate a Python function that accepts a full name as input and formats it in the form “Last, First”.
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 "Invalid input. Please provide a full name with at least a first and last name."

    # 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
# Example usage:
print(format_name("John smith"))  # Output: "Doe, John"
print(format_name("anitha rao"))
print(format_name("brown michael"))


```

```
Pictures/#Generate a Python function that convert.py"
10 cm is equal to 3.937007874015748 inches.
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/param/OneDrive/
Pictures/#Generate a Python function that convert.py"
Doe, John
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/param/OneDrive/
Pictures/#Generate a Python function that convert.py"
smith, John
rao, anitha
michael, brown
PS C:\Users\param\Downloads\AI Coding>
```

Explaination :

Name Formatting (“Last, First”)

1. The function format_name(full_name) takes a **full name string** as input.
2. strip() removes any extra spaces at the beginning or end of the name.
3. split() divides the name into individual words.
4. The **first word** is treated as the first name.
5. The **last word** is treated as the last name.
6. The function rearranges the name in the format **“Last, First”**.
7. The formatted name is returned as 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:

o Accuracy o

Readability o

Logical clarity

Expected Output

• Two vowel-counting functions

• Comparison table or short reflection paragraph

• Conclusion on prompt effectiveness

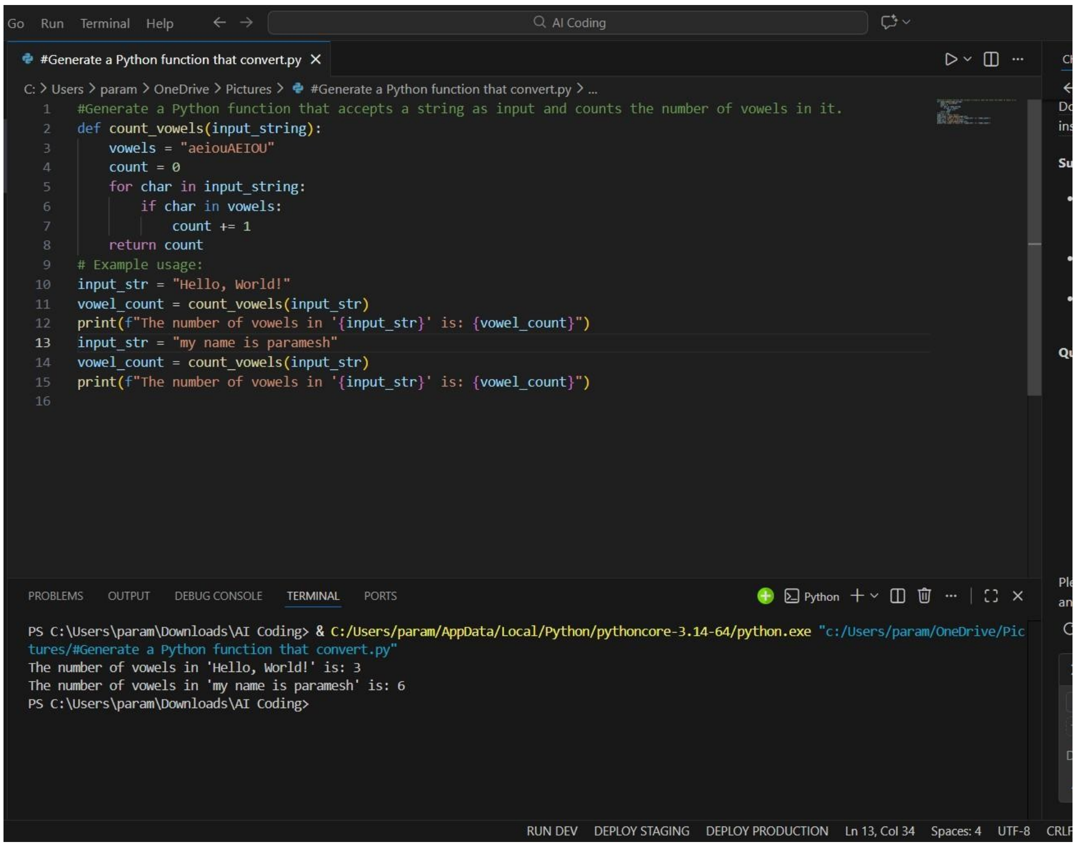
Prompt:

Generate a Python function that accepts a string as input and counts the number of vowels in it.

Code :

```
def count_vowels_zero_shot(text):
    vowels = "aeiouAEIOU"
    count = 0
    for ch in text:
        if ch in vowels:
            count += 1
    return count
```

output :



```python
#Generate a Python function that accepts a string as input and counts the number of vowels in it.
def count_vowels(input_string):
    vowels = "aeiouAEIOU"
    count = 0
    for char in input_string:
        if char in vowels:
            count += 1
    return count
# Example usage:
input_str = "Hello, World!"
vowel_count = count_vowels(input_str)
print(f"The number of vowels in '{input_str}' is: {vowel_count}")
input_str = "my name is paramesh"
vowel_count = count_vowels(input_str)
print(f"The number of vowels in '{input_str}' is: {vowel_count}")
```

```
PS C:\Users\param\Downloads\AI Coding> & C:/Users/param/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/param/OneDrive/Pictures/#Generate a Python function that convert.py"
The number of vowels in 'Hello, World!' is: 3
The number of vowels in 'my name is paramesh' is: 6
PS C:\Users\param\Downloads\AI Coding>
```

Explaination :

Comparison Table: Zero-Shot vs Few-Shot

Criteria	**Zero-Shot Version**	**Few-Shot Version**
Accuracy	Correct	Correct
Readability	Easy to understand (loop-based)	Concise and clean
Logical Clarity	Explicit step-by-step logic	Compact logic using Python features
Code Length	Slightly longer	Shorter

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.

Code:

```
def count_lines_in_file(file_path):
    # Open the file in read mode
    with open(file_path, 'r') as file:
        # Read all lines from the file
        lines = file.readlines()


        # Return the number of lines
        return len(lines)
line_count = count_lines_in_file("python.txt")
print("The number of lines in the file is:", line_count)
```

```
line_count = count_lines_in_file("python.txt")
print("The number of lines in the file is:", line_count)
```

explaination :

1) The function count_lines_in_file() opens a text file in read mode.

2)readlines() reads all lines from the file.

3) len() counts the total number of lines.

4) The function returns the line count as output.

Input: Hello World

File handling in Python Counting

number of lines Output:

The number of lines in the file is: 3