

# 2303A51924

## Lab 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

Note: No input-output examples should be provided in the prompt

The screenshot shows a code editor interface with the following details:

- File Explorer:** Shows a folder named "AI CODING" containing files: add.py, Al lab43.py, assignment 3.4, factorial.py, jobs.py, jobspp.py, lab assignment3.3.pdf, lab1 HCP.pdf, matrixHCP.py, Untitled20.ipynb, and week2 HCP.pdf.
- Code Editor:** Displays the content of Al lab43.py. The code defines a function is\_leap\_year that checks if a year is a leap year based on the rules: divisible by 4 and not by 100, or divisible by 400. It then prompts the user for a year and prints whether it is a leap year or not.

```
def is_leap_year(year):
    if year % 4 == 0 and year % 100 != 0 or (year % 400 == 0):
        print(f"{year} is a leap year.")
    else:
        print(f"{year} is not a leap year.")

year = int(input("Enter a year: "))
```

- Terminal:** Shows the command PS D:\AI Coding> & C:/Users/NDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/Al lab43.py". It then shows two instances of an error message: "IndentationError: unexpected indent". Finally, it shows the user entering "2022" and the output "2022 is not a leap year."

```
PS D:\AI Coding> & C:/Users/NDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/Al lab43.py"
File "d:/AI Coding/Al lab43.py", line 13
    def cm_to_inches(cmeters):
      ^
IndentationError: unexpected indent
PS D:\AI Coding> & C:/Users/NDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/Al lab43.py"
File "d:/AI Coding/Al lab43.py", line 13
    def cm_to_inches(cmeters):
      ^
IndentationError: unexpected indent
PS D:\AI Coding> Enter a year: 2022
2022 is not a leap year.
```

- Output:** Shows the Python environment and a powershell window.

## 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

The screenshot shows a code editor interface with the following details:

- File Explorer:** Shows files in the "AI CODING" folder, including "add.py", "AI lab43.py", "assignment 3.4", "assignment 3.py", "assignment3.4.docx", "factorial.py", "jobs.py", "jobscp.py", "lab assignment3.3.pdf", "lab1 HCP.pdf", "matrixHCP.py", "Untitled20.ipynb", and "week2 HCP.pdf".
- Code Editor:** The active file is "AI lab43.py". The code defines a function `cm_to_inches(cm)` that returns the value of `cm / 2.54`. It includes three print statements for testing: `print(cm_to_inches(10))`, `print(cm_to_inches(25.4))`, and `print(cm_to_inches(0))`.
- Terminal:** The terminal tab shows the command `python.exe "d:/AI Coding/AI lab43.py"` being run. It outputs the expected results for the test cases: 3.937007874015748, 10.0, and 0.0. However, it also displays an `IndentationError: unexpected indent` message, indicating a syntax error in the script.

### 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”

The screenshot shows a code editor interface with the following details:

- File Explorer:** Shows files in the "AI CODING" folder, including "add.py", "AI lab43.py", "assignment 3.py", "assignment 3.4", "assignment 3.4.docx", "factorial.py", "jobs.py", "jobs.py", "lab assignment3.3.pdf", "lab1 HCP.pdf", "matrixHCP.py", "Untitled20.ipynb", and "week2 HCP.pdf".
- Code Editor:** The active file is "AI lab43.py" containing the following code:

```
1 # 
2 #
3 #-----3. Format Full Name -----
4 def format_full_name(full_name):
5     first, last = full_name.split()
6     return f"{last}, {first}"
7
8 # Sample inputs and outputs
9 print(format_full_name("John Smith")) # Output: "Smith, John"
10 print(format_full_name("Anita Rao")) # Output: "Rao, Anita"
11
12
```

- Terminal:** Shows the following command-line session:

```
IndentationError: unexpected indent
PS D:\AI Coding> & C:/Users/ANDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
Enter a year: 2022
2022 is not a leap year.
PS D:\AI Coding> & C:/Users/ANDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
3.937007874015748
10.0
0.0
PS D:\AI Coding> & C:/Users/ANDALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
Smith, John
Rao, Anita
PS D:\AI Coding>
```

## 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

The screenshot shows a code editor interface with two tabs open: 'assignment 3.py' and 'AI lab43.py'. The 'AI lab43.py' tab contains the following Python code:

```
13
14 # Sample input and output
15 if __name__ == "__main__":
16     filename = 'sample.txt' # Replace with your .txt file name
17     line_count = count_lines_in_file(filename)
18     print(f"Number of lines: {line_count}")
19
20 def count_vowels(text):
21     vowels = "aeiouAEIOU"
22     return sum(1 for char in text if char in vowels)
23
24 # Sample input and output
25 if __name__ == "__main__":
26     sample_text = "Hello world"
27     vowel_count = count_vowels(sample_text)
28     print(f"Number of vowels: {vowel_count}")
29
30
```

The terminal below shows three attempts to run the script, each resulting in an error due to a missing 'sample.txt' file:

```
PS D:\AI Coding> & C:/Users/ANOALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
PS D:\AI Coding> & C:/Users/ANOALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
PS D:\AI Coding> & C:/Users/ANOALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
PS D:\AI Coding> Number of vowels: 3
```

## 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

The screenshot shows a Microsoft Visual Studio Code (VS Code) interface. On the left is the Explorer sidebar with a tree view of files and folders. The current folder is 'AI CODING' containing files like 'add.py', 'AI lab43.py', 'assignment 3.4', 'assignment 3.4.docx', 'factorial.py', 'jobs.py', 'jobs.py', 'lab assignment3.3.pdf', 'lab1 HCP.pdf', 'matrixHCP.py', 'Untitled20.ipynb', and 'week2 HCP.pdf'. The main editor area displays a Python script named 'AI lab43.py' with the following code:

```
#=====
#=====
def count_lines_in_file(filename):
    try:
        with open(filename, 'r') as file:
            lines = file.readlines()
        return len(lines)
    except Exception as e:
        print(f"An error occurred: {e}")
    return 0

# Example usage
```

Below the editor is a terminal window showing command-line output:

```
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
PS D:\AI Coding> & C:/Users/ANALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
Number of vowels: 3
PS D:\AI Coding> & C:/Users/ANALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
```

The bottom right corner shows a sidebar with several Python-related items.