

**2303A51924**

## Lab Assignment: 4.3

### Task 1: Zero-Shot Prompting – Leap Year Check

Scenario

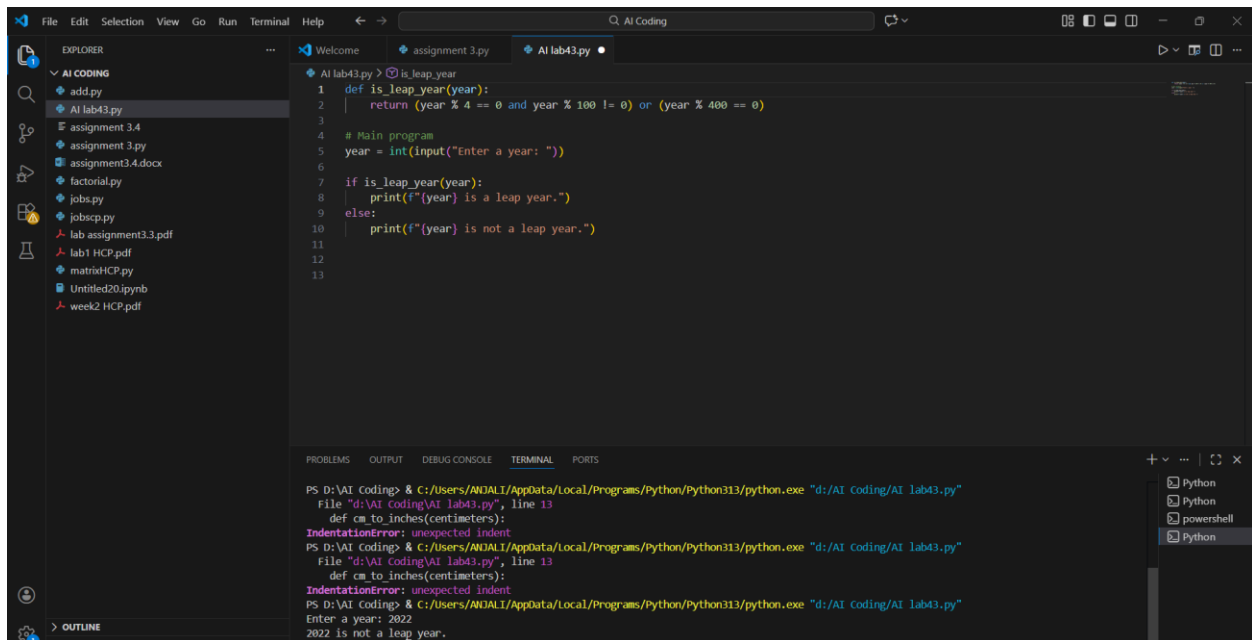
Zero-shot prompting involves giving instructions without providing examples.

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



```
File Edit Selection View Go Run Terminal Help
AI CODING
  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
  week2 HCP.pdf

AI lab43.py > is_leap_year
1 def is_leap_year(year):
2     return (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0)
3
4 # Main program
5 year = int(input("Enter a year: "))
6
7 if is_leap_year(year):
8     print(f"{year} is a leap year.")
9 else:
10    print(f"{year} is not a leap year.")
11
12
13

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS D:\AI Coding> & C:/Users/ANJALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
File "d:/AI Coding/AI lab43.py", line 13
    def cm to inches(centimeters):
    ^
IndentationError: unexpected indent
PS D:\AI Coding> & C:/Users/ANJALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
File "d:/AI Coding/AI lab43.py", line 13
    def cm to inches(centimeters):
    ^
IndentationError: unexpected indent
PS D:\AI Coding> & C:/Users/ANJALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
Enter a year: 2022
2022 is not a leap year.
```

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

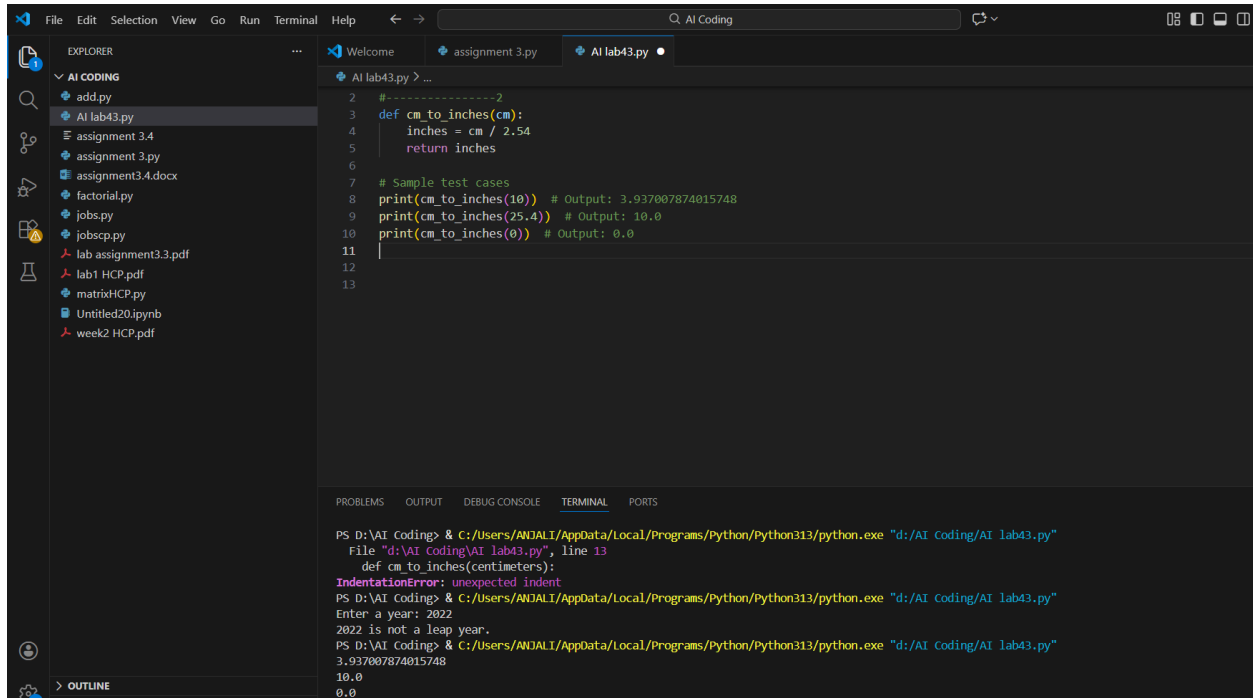
### Scenario

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



```
File Edit Selection View Go Run Terminal Help
EXPLORER
  AI CODING
    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
    week2 HCP.pdf
  AI lab43.py > ...
  2 #-----2
  3 def cm_to_inches(cm):
  4     inches = cm / 2.54
  5     return inches
  6
  7 # Sample test cases
  8 print(cm_to_inches(10)) # Output: 3.937007874015748
  9 print(cm_to_inches(25.4)) # Output: 10.0
 10 print(cm_to_inches(0)) # Output: 0.0
 11
 12
 13

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS D:\AI Coding> & C:/Users/ANDALI/AppData/Local/Programs/Python/python313/python.exe "d:/AI Coding/AI lab43.py"
File "d:/AI Coding/AI lab43.py", line 13
    def cm_to_inches(centimeters):
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
```

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

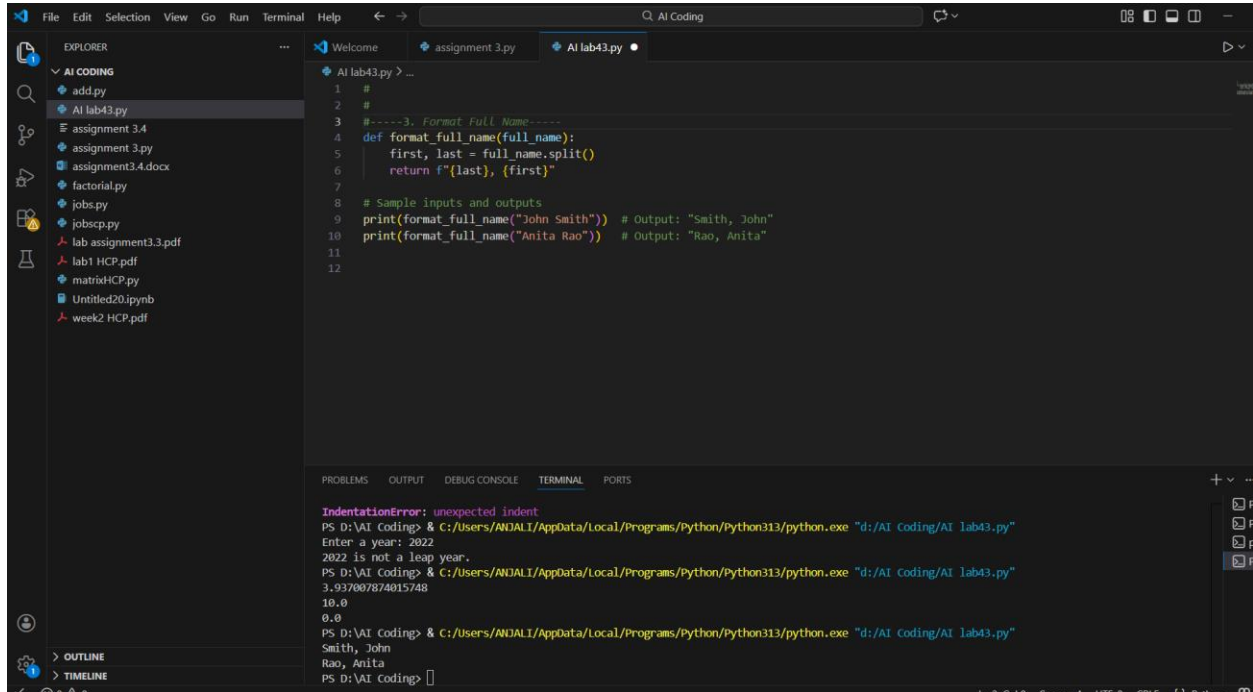
#### Scenario

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 Visual Studio Code editor with a file explorer on the left and a code editor in the center. The file explorer shows a project named 'AI CODING' with several files, including 'AI lab43.py'. The code editor displays the following Python 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
```

Below the code editor, the terminal window shows the execution of the script. It displays an indentation error, followed by the execution of the script which produces the expected output for the sample inputs.

```
IndentationError: unexpected indent
PS D:\AI Coding> & C:/Users/ANJALI/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/ANJALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
3.937607874015748
10.0
0.0
PS D:\AI Coding> & C:/Users/ANJALI/AppData/Local/Programs/Python/Python313/python.exe "d:/AI Coding/AI lab43.py"
Smith, John
Rao, Anita
PS D:\AI Coding>
```

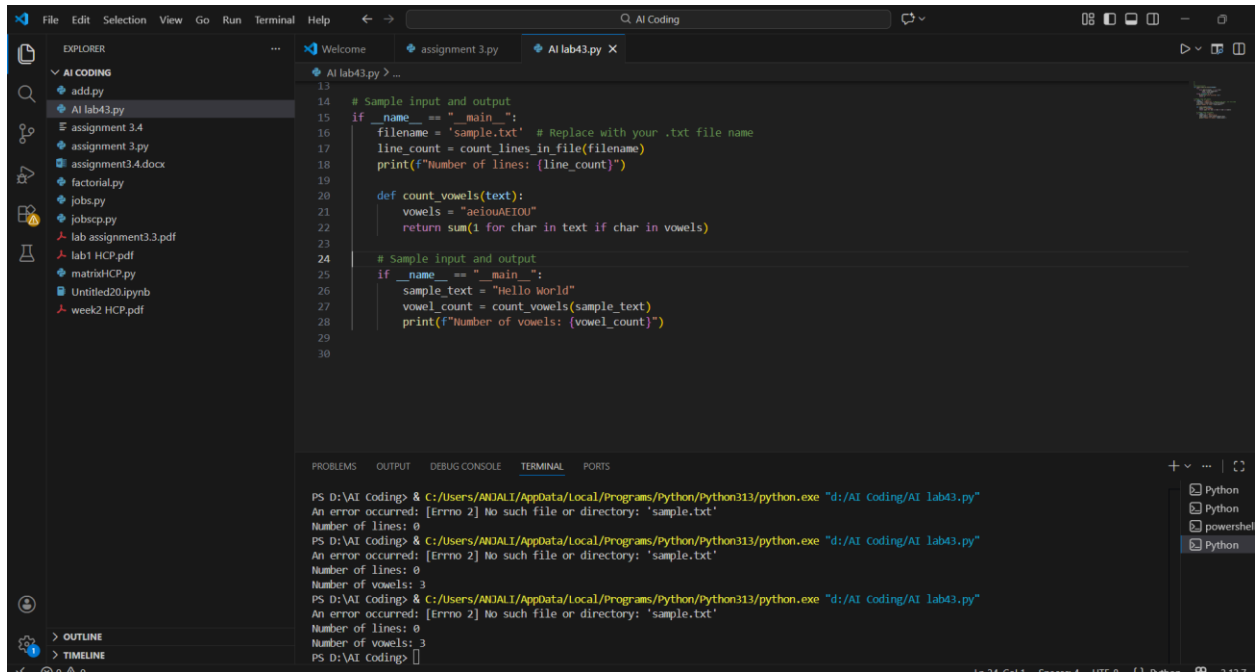
## Task 4: Comparative Analysis – Zero-Shot vs Few-Shot

### 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:
  - o Accuracy
  - o Readability
  - o Logical clarity



The screenshot shows a Visual Studio Code editor with a Python file named `AI lab43.py` open. The file contains two code blocks. The first block, starting at line 14, is a function `count_lines_in_file` that takes a filename and returns the number of lines. The second block, starting at line 24, is a function `count_vowels` that takes a text string and returns the count of vowels. The terminal at the bottom shows the execution of the script. It displays the output of the `count_lines_in_file` function for a file named `sample.txt`, which is 0 lines. It then displays the output of the `count_vowels` function for the string `"Hello World"`, which is 3 vowels. The terminal also shows error messages for the `sample.txt` file not existing.

```
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
```

```
PS D:\AI Coding> & C:/Users/ANJALI/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/ANJALI/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/ANJALI/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>
```

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

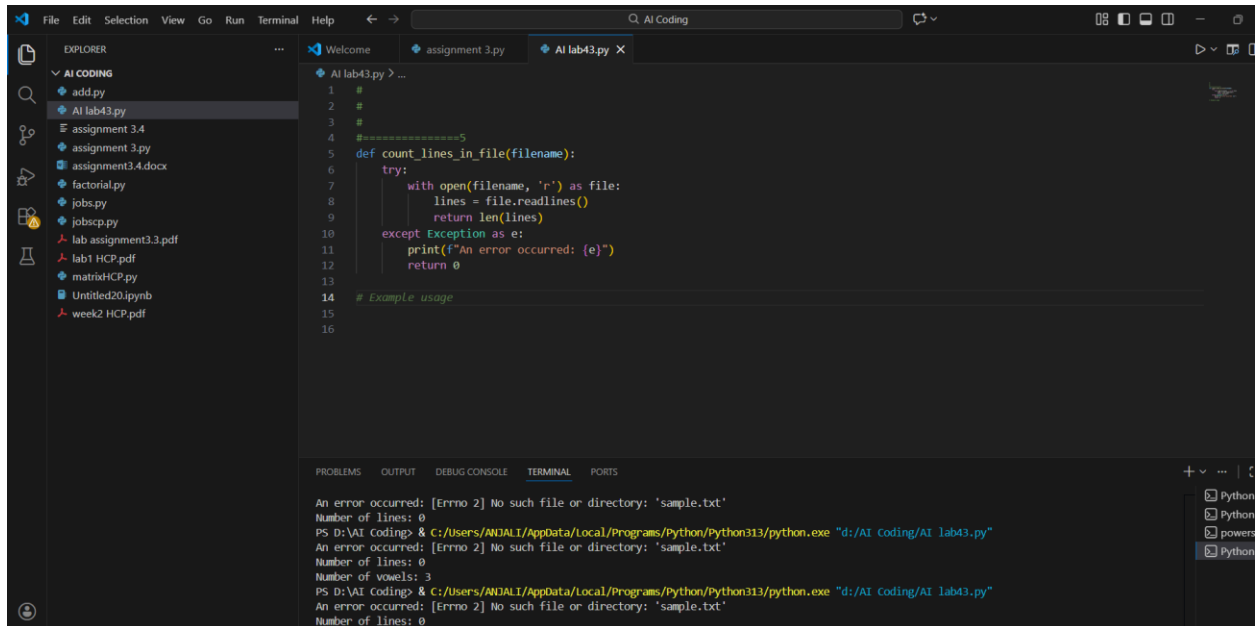
Scenario

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 Visual Studio Code editor window with a dark theme. The Explorer sidebar on the left lists files in a project named 'AI CODING', 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'. The main editor area displays the content of 'AI lab43.py', which contains a Python function `count_lines_in_file` that takes a filename, opens the file, reads all lines, and returns the count. It also includes an example usage comment. The bottom panel shows the 'TERMINAL' tab with the following output:

```
An error occurred: [Errno 2] No such file or directory: 'sample.txt'
Number of lines: 0
PS D:\AI Coding> & C:/Users/ANDALI/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/ANDALI/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
```