ASSIGNMENT-4.3

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Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques

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.

```python
#Task 1: Zero-Shot Prompting – Leap Year Check
def is_leap_year(year):
    if (year % 400 == 0) or (year % 4 == 0 and year % 100 != 0):
        return "Leap Year"
    else:
        return "Not a Leap Year"
year = int(input("Enter a year: "))
print(is_leap_year(year))
```

```
Enter a year: 2004
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

```python
#Task 2: One-Shot Prompting – Centimeters to Inches
def cm_to_inches(cm):
    return cm / 2.54
cm = float(input("Enter length in centimeters: "))
print("Length in inches:", round(cm_to_inches(cm), 2))
```

```
Enter length in centimeters: 150
Length in inches: 59.06
```

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”

```python
#Task 3: Few-Shot Prompting – Name Formatting
def format_name(full_name):
    parts = full_name.split()
    first_name = parts[0]
    last_name = parts[-1]
    return last_name + ", " + first_name
name = input("Enter full name: ")
print(format_name(name))
```

```
Enter full name: john nick
nick, john
```

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

```python
#Task 4: Comparative Analysis – Zero-Shot vs Few-Shot (Vowel Count)
def count_vowels_zero_shot(text):
    count = 0
    for ch in text.lower():
        if ch in "aeiou":
            count += 1
    return count
text = input("Enter a string: ")
print("Vowel count:", count_vowels_zero_shot(text))
def count_vowels_few_shot(text):
    vowels = "aeiouAEIOU"
    return sum(1 for ch in text if ch in vowels)
text = input("Enter a string: ")
print("Vowel count:", count_vowels_few_shot(text))
```

```
Enter a string: I am a very good girl
Vowel count: 7
Enter a string: hello
Vowel count: 2
```

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

```python
#Task 5: Few-Shot Prompting – File Handling (Line Count)
def count_lines(filename):
    with open(filename, "r") as file:
        return len(file.readlines())
with open("sample.txt", "w") as file:
    file.write("Hello\nWelcome to AI Assisted Coding\nThis is Lab 4\n")
print("Number of lines:", count_lines("sample.txt"))
```

```
Number of lines: 3
```