

Assignment Number: 4.3		
NAME:M.AKASH                      ROLL NO:2303A51820                      BATCH:26		
Q.No.	Question	Expected Time to complete
1	<p><b>Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques</b></p> <p><b>Lab Objectives</b></p> <ul style="list-style-type: none"> <li>• To explore and apply different levels of prompt examples in AI-assisted code generation</li> <li>• To understand how zero-shot, one-shot, and few-shot prompting affect AI output quality</li> <li>• To evaluate the impact of context richness and example quantity on AI performance</li> <li>• To build awareness of prompt strategy effectiveness for different problem types</li> </ul> <p><b>Lab Outcomes (LOs)</b>  <b>After completing this lab, students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Use zero-shot prompting to instruct AI with minimal context</li> <li>• Use one-shot prompting with a single example to guide AI code generation</li> <li>• Apply few-shot prompting using multiple examples to improve AI responses</li> <li>• Compare AI outputs across different prompting strategies</li> </ul>	Week2 - Wednesday
	<p><b>Task 1: Zero-Shot Prompting – Leap Year Check</b></p> <p><b>Scenario</b>  Zero-shot prompting involves giving instructions without providing examples.</p> <p><b>Task Description</b>  Use zero-shot prompting to instruct an AI tool to generate a Python function that:</p> <ul style="list-style-type: none"> <li>• Accepts a year as input</li> <li>• Checks whether the given year is a leap year</li> <li>• Returns an appropriate result</li> </ul> <p><b>Note:</b> No input-output examples should be provided in the prompt.</p> <p><b>Expected Output</b></p>	

```
ed-1  ai assistant  ai assistant.java 3  LeapYearChecker.java

ai assistant > LeapYearChecker.java > Language Support for Java(TM)

1 //generate a java code that accepts a year as input and checks if it is a leap year
2
3 import java.util.Scanner;
4
5 public class LeapYearChecker {
6     public static boolean isLeapYear(int year) {
7         if (year % 4 == 0) {
8             if (year % 100 == 0) {
9                 return year % 400 == 0;
10            }
11            return true;
12        }
13        return false;
14    }
15
16     public static void main(String[] args) {
17         Scanner scanner = new Scanner(System.in);
18         System.out.print(s: "Enter a year: ");
19         int year = scanner.nextInt();
20     }
21 }

Run main | Debug main | Run | Debug

PS C:\dev ops> & 'C:\Program Files\Java\jdk-21.0.10\bin\java.exe' -Xmx1024m -Djava.awt.CodeDetailsInExceptionMessages -cp 'C:\Users\WINDC\code\User\workspaceStorage\1e0d68f7cdf4b80abc760bf2e27fe\ws\dev_ops_f5e8aa6f\bin' 'LeapYearChecker'
Enter a year: 2032
2032 is a leap year.
PS C:\dev ops>
```

## 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

	<div> <div> <div>J ai assistant.java 3</div> <div>J LeapYearChecker.java 1</div> <div>J CentimetersToInchesConverter.java 1</div> </div> <div> <div>ai assistant &gt; J CentimetersToInchesConverter.java &gt; Java &gt; CentimetersToInchesConverter.java</div> <div> <pre> 1 //Use one-shot prompting by providing one input-output 2 //• Converts centimeters to inches 3 //• Uses the correct mathematical formula 4 5 import java.util.Scanner; 6 public class CentimetersToInchesConverter { 7     public static double convertCmToInches(double centimeters) { 8         return centimeters / 2.54; 9     } 10 11     public static void main(String[] args) { 12         Scanner scanner = new Scanner(System.in); 13         System.out.print(s: "Enter length in centimeters: "); 14         double centimeters = scanner.nextDouble(); 15         double inches = convertCmToInches(centimeters); 16         System.out.printf(format: "%.2f centimeters is equal to %.2f inches.", centimeters, inches); 17         scanner.close(); 18     } 19 } </pre> </div> <div> <div>Run main   Debug main   Run   Debug</div> <div>PROBLEMS 5 OUTPUT TERMINAL ...</div> <div>Run: CentimetersToInchesConverter</div> <div> <pre> PS C:\dev ops&gt; PS C:\dev ops&gt; c::; cd 'c:\dev ops'; &amp; 'C:\Program Files\Java\jdk-11.0.10\bin\java.exe' -ShowCodeDetailsInExceptionMessages -cp 'C:\Users\WINDOWS\AppData\Local\Temp\1e0d68f7cdf4b80abc760bf2e27fed0f\redhat.java\jdt_ws\CentimetersToInchesConverter' Enter length in centimeters: 165 165.00 centimeters is equal to 64.96 inches. PS C:\dev ops&gt; </pre> </div> </div> </div> </div>	
	<p><b>Task 3: Few-Shot Prompting – Name Formatting</b></p> <p><b>Scenario</b> Few-shot prompting improves accuracy by providing multiple examples.</p> <p><b>Task Description</b> Use few-shot prompting with 2–3 examples to generate a Python function that:</p> <ul style="list-style-type: none"> <li>• Accepts a full name as input</li> <li>• Formats it as “Last, First”</li> </ul> <p><b>Example formats:</b></p> <ul style="list-style-type: none"> <li>• "John Smith" → "Smith, John"</li> <li>• "Anita Rao" → "Rao, Anita"</li> </ul> <p><b>Expected Output</b></p>	

J LeapYearChecker.java 1

J CentimetersToInchesConverter.java 1

ai assistant > J NameFormatter.java > Language Support for Java(TM) by Red Ha

```
1 //Use few-shot prompting with 2-3 examples to generate
2 //• Accepts a full name as input
3 //• Formats it as "Last, First"
4
5 import java.util.Scanner;
6
7 public class NameFormatter {
8     public static String formatName(String fullName) {
9         String[] parts = fullName.split(regex: " ");
10        if (parts.length >= 2) {
11            return parts[parts.length - 1] + ", " + par
12        }
13        return fullName;
14    }
15
16    Run main | Debug main | Run | Debug
17    public static void main(String[] args) {
18        Scanner scanner = new Scanner(System.in);
19        System.out.print(s: "Enter a full name: ");
20        String fullName = scanner.nextLine();
21        System.out.println("Formatted name: " + formatN
22    }
```

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL PORTS Run: I

```
+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\WINDOWS\AppDataLocal\Temp\1e0d68f7cdf4b80abc760bf2e27fed0f\redhat.java\jdt_ws\NameFormatter'
```

```
Enter a full name: AKASH MANCHIKATLA
```

```
Formatted name: MANCHIKATLA, AKASH
```

```
PS C:\dev ops> |
```

#### 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

##### Expected Output

J CentimetersToInchesConverter.java 1

J NameFormatter.java 1

ai assistant > J VowelCounter.java > ...

```
1  /* Use zero-shot prompting to generate a function that
2  /* Use few-shot prompting for the same problem
3  /* Compare both outputs based on:
4  /* Accuracy
5  /* Readability
6  /* Logical clarity
7  ?
8  import java.util.Scanner;
9
10 public class VowelCounter {
11     public static int countVowels(String str) {
12         int count = 0;
13         String vowels = "aeiouAEIOU";
14         for (char c : str.toCharArray()) {
15             if (vowels.indexOf(c) != -1) {
16                 count++;
17             }
18         }
19         return count;
20     }
21 }
```

Run main | Debug main | Run | Debug

PROBLEMS 7 OUTPUT DEBUG CONSOLE TERMINAL PORTS Run

```
+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\WINDOWS\AppData\Local\Temp\aceStorage\1e0d68f7cdf4b80abc760bf2e27fed0f\redhat.java\jdt_ws\dev\bin\
unter'
Enter a string: ai assistant
Number of vowels in the string: 5
PS C:\dev ops> 9
```

2.vowel count using few shot

### 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

**Prompt:** //generate a Java program that reads a text file and counts the number of lines in it. Counts the lines and prints the result to the console. code reads the file name as input from the user from the system and access the file to count the lines.

```
Converter.java 1  J :: || ↺ ↓ ↑ ↻ □ ▾ LineCounter ▾ 1
ai assistant > J Main.java > Java > Main > main(String[] args)
1 //generate a Java program that reads a text file and co
2
3 import java.io.BufferedReader;
4 import java.io.FileReader;
5 import java.io.IOException;
6 public class Main {
    Run main | Debug main | Run | Debug
7     public static void main(String[] args) {
8         String filePath = "D:\\ai assist\\hii.txt";// R
9         try {
10             int lineCount = countLinesInFile(filePath);
11             System.out.println("Number of lines in the
12         } catch (IOException e) {
13             System.err.println("An error occurred while
14         }
15     }
16
17     public static int countLinesInFile(String filePath)
18         int lineCount = 0;
19         try (BufferedReader reader = new BufferedReader
20             while (reader.readLine() != null) {
21                 lineCount++;
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