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BATCH:26

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		Assignment Type: Lab	Academic Year:2025-2026
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Course Code	23CS002PC304	Course Title	AI Assisted Coding
Year/Sem	III/I	Regulation	R23
Date and Day of Assignment	Week 2 - Wednesday	Time(s)	23CSBTB01 To 23CSBTB52
Duration	2 Hours	Applicable to Batches	All batches
Assignment Number: 3.3(Present assignment number)/24(Total number of assignments)			
Q.No.	Question	Expected Time to complete	
1	<b>Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques</b>  <b>Lab Objectives</b> <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>	Week2 - Wednesday	

**Lab Outcomes (LOs)**

After completing this lab, students will be able to:

- Use zero-shot prompting to instruct AI with minimal context
- Use one-shot prompting with a single example to guide AI code generation
- Apply few-shot prompting using multiple examples to improve AI responses
- Compare AI outputs across different prompting strategies

**Task 1: Zero-Shot Prompting – Leap Year Check****Scenario**

Zero-shot prompting involves giving instructions without providing examples.

**Task Description**

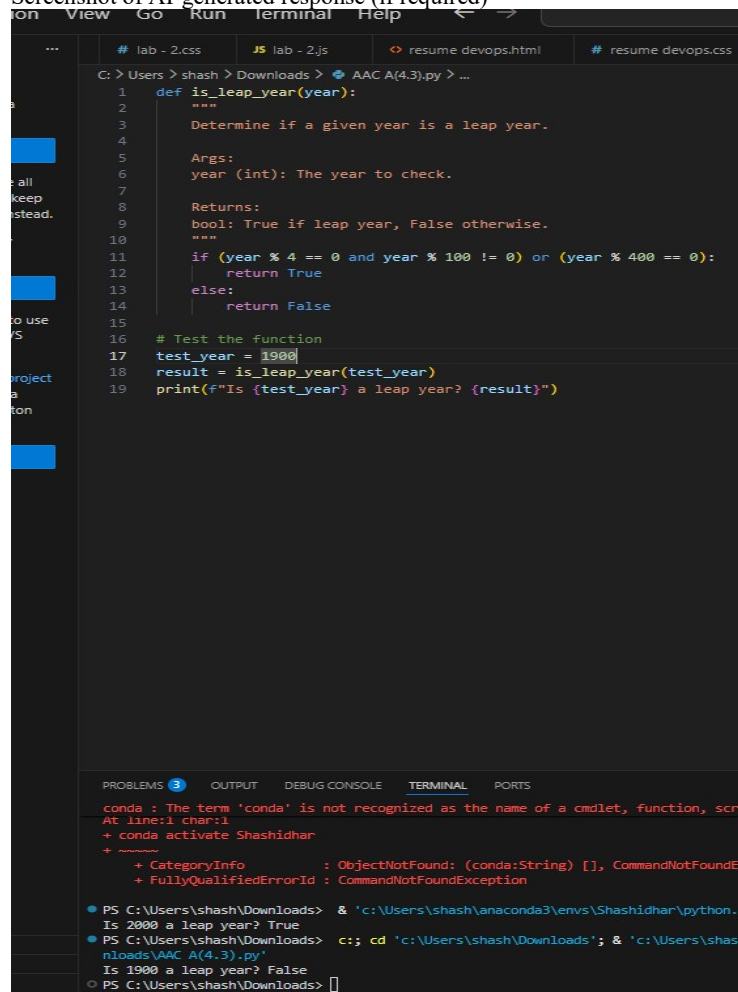
Use zero-shot prompting to instruct an AI tool to generate a Python function that:

- 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.

**Expected Output**

- AI-generated leap year checking function
- Correct logical conditions
- Sample input and output
- Screenshot of AI-generated response (if required)



```
def is_leap_year(year):  
    """  
    Determine if a given year is a leap year.  
    Args:  
        year (int): The year to check.  
    Returns:  
        bool: True if leap year, False otherwise.  
    """  
    if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):  
        return True  
    else:  
        return False  
  
# Test the function  
test_year = 1900  
result = is_leap_year(test_year)  
print(f"Is {test_year} a leap year? {result}")
```

Terminal Output:

```
conda : The term 'conda' is not recognized as the name of a cmdlet, function, scri  
At line:1 char:1  
+ conda activate Shashidhar  
+ ~~~~~  
+ CategoryInfo          : ObjectNotFound: (conda:String) [], CommandNotFoundEx  
+ FullyQualifiedErrorId : CommandNotFoundException  
  
PS C:\Users\shash\Downloads> & 'c:\Users\shash\anaconda3\envs\Shashidhar\python.e  
Is 2000 a leap year? True  
PS C:\Users\shash\Downloads> c:; cd 'c:\Users\shash\Downloads'; & 'c:\Users\shash  
nloads\AAC A(4.3).py'  
Is 1900 a leap year? False  
PS C:\Users\shash\Downloads> |
```

**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:

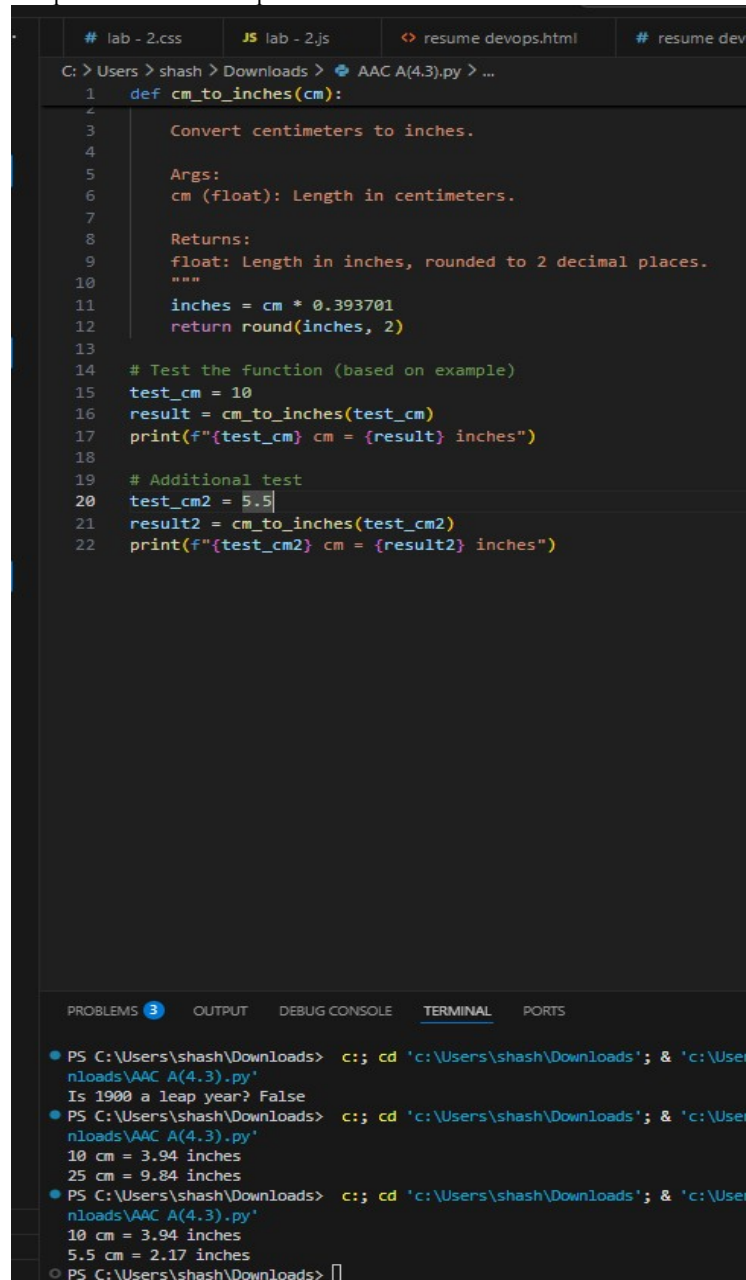
- Converts centimeters to inches
- Uses the correct mathematical formula

**Example provided in prompt:**

Input: 10 cm → Output: 3.94 inches

**Expected Output**

- Python function with correct conversion logic
- Accurate calculation
- Sample test cases and outputs



```
# lab - 2.css JS lab - 2.js resume devops.html # resume devops.html
C: > Users > shash > Downloads > AAC A(4.3).py > ...
1 def cm_to_inches(cm):
2
3     Convert centimeters to inches.
4
5     Args:
6     cm (float): Length in centimeters.
7
8     Returns:
9     float: Length in inches, rounded to 2 decimal places.
10    """
11    inches = cm * 0.393701
12    return round(inches, 2)
13
14    # Test the function (based on example)
15    test_cm = 10
16    result = cm_to_inches(test_cm)
17    print(f"{test_cm} cm = {result} inches")
18
19    # Additional test
20    test_cm2 = 5.5
21    result2 = cm_to_inches(test_cm2)
22    print(f"{test_cm2} cm = {result2} inches")

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS

• PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\Users\shash\Downloads\AAC A(4.3).py'
Is 1900 a leap year? False
• PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\Users\shash\Downloads\AAC A(4.3).py'
10 cm = 3.94 inches
25 cm = 9.84 inches
• PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\Users\shash\Downloads\AAC A(4.3).py'
10 cm = 3.94 inches
5.5 cm = 2.17 inches
• PS C:\Users\shash\Downloads> 
```

**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:

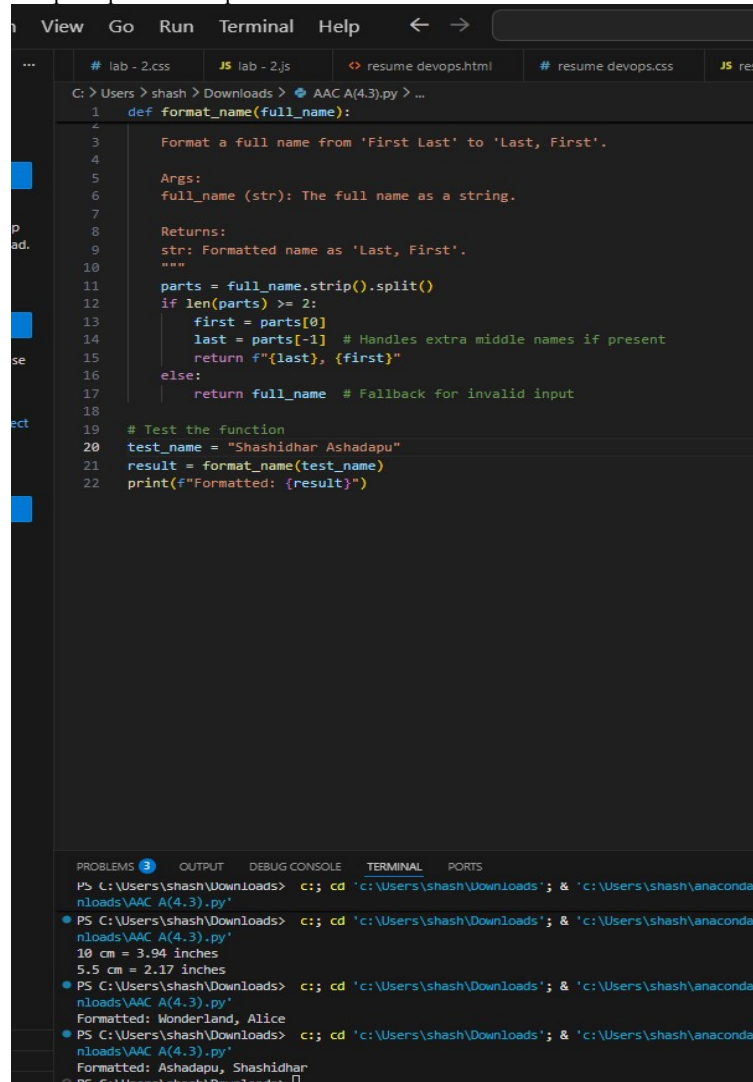
- Accepts a full name as input
- Formats it as "Last, First"

**Example formats:**

- "John Smith" → "Smith, John"
- "Anita Rao" → "Rao, Anita"

**Expected Output**

- Well-structured Python function
- Output strictly following example patterns
- Correct handling of names
- Sample inputs and outputs



The screenshot shows a VS Code editor with a Python file named 'AAC A(4.3).py'. The code defines a function 'format\_name' that takes a full name as input and returns it formatted as 'Last, First'. The function uses 'strip()' and 'split()' to handle the input. Below the function definition, there is a test case where 'Shashidhar Ashadapu' is passed to the function, and the output is 'Ashadapu, Shashidhar'. The terminal at the bottom shows the command 'python AAC A(4.3).py' being executed, and the output 'Formatted: Ashadapu, Shashidhar' is displayed.

```
def format_name(full_name):
    """
    Format a full name from 'First Last' to 'Last, First'.

    Args:
        full_name (str): The full name as a string.

    Returns:
        str: Formatted name as 'Last, First'.
    """
    parts = full_name.strip().split()
    if len(parts) >= 2:
        first = parts[0]
        last = parts[-1] # Handles extra middle names if present
        return f"{last}, {first}"
    else:
        return full_name # Fallback for invalid input

# Test the function
test_name = "Shashidhar Ashadapu"
result = format_name(test_name)
print(f"Formatted: {result}")
```

Terminal Output:

```
PS C:\Users\shash\Downloads> python AAC A(4.3).py
Formatted: Ashadapu, Shashidhar
```

**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

- Two vowel-counting functions
- Comparison table or short reflection paragraph
- Conclusion on prompt effectiveness

```
ps.html # resume devops.css JS resume devops.js <> Tavinos.html #
C: > Users > shash > Downloads > AAC A(4.3).py > ...
1 def count_vowels(text):
2     """
3     Count the number of vowels in a given text.
4
5     Args:
6     text (str): The input string.
7
8     Returns:
9     int: Number of vowels (a, e, i, o, u, case-insensitive).
10    """
11    vowels = 'aeiouAEIOU'
12    count = 0
13    for char in text:
14        if char in vowels:
15            count += 1
16    return count
17
18 # Test
19 test_text = "Shashidhar Ashadapu"
20 result = count_vowels(test_text)
21 print(f"Vowels in '{test_text}': {result}")

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS
xe' 'c:\Users\shash\.vscode\extensions\ms-python.debugpy-2025.18.0-win
Formatted: Ashadapu, Shashidhar
PS C:\Users\shash\Downloads> c; cd 'c:\Users\shash\Downloads'; & 'c
undled\libs\debugpy\launcher' '50181' '--' 'c:\Users\shash\Downloads\
Vowels in 'hello world': 3
PS C:\Users\shash\Downloads> c; cd 'c:\Users\shash\Downloads'; & 'c
undled\libs\debugpy\launcher' '50890' '--' 'c:\Users\shash\Downloads\
Vowels in 'Shashidhar Ashadapu': 7
PS C:\Users\shash\Downloads> 
```

### 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

- Working Python file-processing function
- Correct line count
- Sample .txt input and output
- AI-assisted logic explanation

```
os.html # resume devops.css JS resume devops.js <> Tavinios.html # Tav
C: > Users > shash > Downloads > AAC A(4.3).py > ...
1 def count_lines_in_file(file_path):
2     """
3     Count the number of lines in a text file.
4
5     Args:
6     file_path (str): Path to the .txt file.
7
8     Returns:
9     int: Number of lines, or 0 if file not found.
10
11     Raises:
12     FileNotFoundError: If the file doesn't exist.
13     """
14     try:
15         with open(file_path, 'r') as file:
16             lines = file.readlines()
17             return len(lines)
18     except FileNotFoundError:
19         print(f"Error: File '{file_path}' not found.")
20         return 0
21
22 # Create a sample file for testing (run this once)
23 with open('sample.txt', 'w') as f:
24     f.write(["Line1\nLine2\nLine3\nLine4\nLine5"])
25
26 # Test the function
27 result = count_lines_in_file('sample.txt')
28 print(f"Line count in 'sample.txt': {result}")

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS
undled\libs\debugpy\launcher' '50181' '--' 'c:\Users\shash\Downloads\AAC
Vowels in 'hello world': 3
PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\U
undled\libs\debugpy\launcher' '50890' '--' 'c:\Users\shash\Downloads\AAC
Vowels in 'Shashidhar Ashadapu': 7
● PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\U
undled\libs\debugpy\launcher' '61017' '--' 'c:\Users\shash\Downloads\AAC
Line count in 'sample.txt': 3
● PS C:\Users\shash\Downloads> c::; cd 'c:\Users\shash\Downloads'; & 'c:\U
undled\libs\debugpy\launcher' '64519' '--' 'c:\Users\shash\Downloads\AAC
Line count in 'sample.txt': 5
○ PS C:\Users\shash\Downloads> 
```

●  
**Note: Report should be submitted as a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots.**