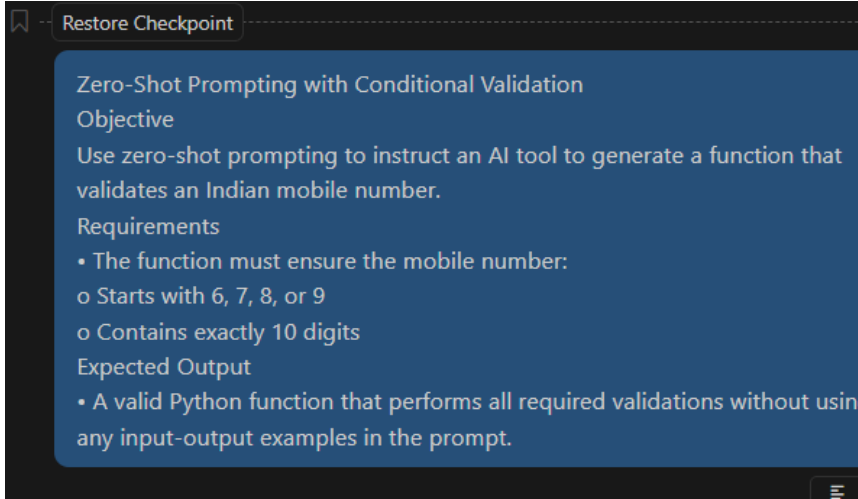


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batch-06

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		Assignment Type: Lab	Academic Year: 2025-2026
Course Coordinator Name		Venkataramana Veeramsetty	
Instructor(s) Name		Dr. V. Venkataramana (Co-Ordinator)	
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Intern 3 (Sowmya)			
NS_2 (Mounika)			
Course Code	24CS002PC215	Course Title	AI Assisted Coding
Year/Sem	II/I	Regulation	R24
Date and Day of Assignment	Week2 - Monday	Time(s)	
Duration	2 Hours	Applicable to Batches	
Assignment Number: 4.1(Present assignment number)/24(Total number of assignments)			
Q.No.	Question		Expected Time to complete
1	Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques Lab Objectives: <ul style="list-style-type: none"> To explore and apply different levels of prompt examples 		Week2 - Monday

	<p>in AI-assisted code generation.</p> <ul style="list-style-type: none"> • To understand how zero-shot, one-shot, and few-shot prompting affect AI output quality. • To evaluate the impact of context richness and example quantity on AI performance. • To build awareness of prompt strategy effectiveness for different problem types. <p>Lab Outcomes (LOs): After completing this lab, students will be able to:</p> <ul style="list-style-type: none"> • 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 the three prompting strategies. 	
	<p>Task #1 – Zero-Shot Prompting with Conditional Validation</p> <p>Objective Use zero-shot prompting to instruct an AI tool to generate a function that validates an Indian mobile number.</p> <p>Requirements</p> <ul style="list-style-type: none"> • The function must ensure the mobile number: <ul style="list-style-type: none"> ◦ Starts with 6, 7, 8, or 9 ◦ Contains exactly 10 digits <p>Prompt:</p>  <p>Code:</p>	

> Used 1 reference

```
def is_valid_indian_mobile(number):  
    """  
    Validates an Indian mobile number.  
    Returns True if the number starts with 6, 7, 8, or 9 and  
    """  
    return (  
        isinstance(number, str) and  
        len(number) == 10 and  
        number.isdigit() and  
        number[0] in "6789"  
    )
```

Expected Output

- A valid Python function that performs all required validations without using any input-output examples in the prompt.

```
# Example usage and output:  
print(is_valid_indian_mobile("9876543210")) # Output: True  
print(is_valid_indian_mobile("1234567890")) # Output: False  
print(is_valid_indian_mobile("789654123")) # Output: False  
print(is_valid_indian_mobile("8123456789")) # Output: True
```

Expected output:

```
True  
False  
False  
True
```

Task #2 – One-Shot Prompting with Edge Case Handling

Objective

Use one-shot prompting to generate a Python function that calculates the factorial of a number.

Requirements

- Provide one sample input-output pair in the prompt to guide the AI.
- The function should handle:
 - 0! correctly
 - Negative input by returning an appropriate message
 - Prompt:

	<p>Use one-shot prompting to generate a Python function that calculates the factorial of a number.</p> <p>Requirements</p> <ul style="list-style-type: none"> • Provide one sample input-output pair in the prompt for the AI. • The function should handle: <ul style="list-style-type: none"> o 0! correctly o Negative input by returning an appropriate message <p>Expected Output</p> <ul style="list-style-type: none"> • A Python function with correct factorial logic and edge case handling, generated from a single example <p>Code:</p> <pre>def factorial(n): if n < 0: return "Invalid input: factorial is undefined for negative numbers" if n == 0: return 1 result = 1 for i in range(1, n + 1): result *= i return result</pre> <p>Expected Output</p> <ul style="list-style-type: none"> • A Python function with correct factorial logic and edge case handling, generated from a single example. <pre>Thought for 10s • Input: 5 Output: 120 • Input: 0 Output: 1 • Input: -4 Output: "Invalid input: factorial is undefined for negative numbers"</pre>	
	<p>Task #3 – Few-Shot Prompting for Nested Dictionary Extraction</p>	

Objective

Use few-shot prompting (2–3 examples) to instruct the AI to create a function that parses a nested dictionary representing student information.

Requirements

- The function should extract and return:
 - Full Name
 - Branch
 - SGPA
 - Prompt:
 -

Use few-shot prompting (2–3 examples) to instruct the AI to create a function that parses a nested dictionary representing student information.

Requirements

- The function should extract and return:
 - Full Name
 - Branch
 - SGPA

Code:

```
def walk(obj: Any) -> None:
    nonlocal first, middle, last, full, branch, sgpa
    if isinstance(obj, dict):
        for k, v in obj.items():
            nk = norm(k)
            if nk in name_keys and isinstance(v, str) and not full: full = v.strip() or Nor
            if nk in first_keys and isinstance(v, str) and not first: first = v.strip() or
            if nk in middle_keys and isinstance(v, str) and not middle: middle = v.strip()
            if nk in last_keys and isinstance(v, str) and not last: last = v.strip() or Nor
            if nk in branch_keys and isinstance(v, str) and not branch: branch = v.strip()
            if nk in sgpa_keys:
                val = to_float(v)
                if val is not None: sgpa = val
            walk(v)
    elif isinstance(obj, (list, tuple, set)):
        for item in obj: walk(item)

walk(data)
full_name = " ".join([p for p in (first, middle, last) if p]) or full
return {"full_name": full_name, "branch": branch, "sgpa": sgpa}
```

```
python
from typing import Any, Dict, Optional, Union

def parse_student_info(data: Dict[str, Any]) -> Dict[str, Optional[Union[str, float]]]:
    def norm(s: str) -> str: return "".join(c for c in s.lower() if c.isalnum())
    def to_float(x: Any) -> Optional[float]:
        try: return float(x)
        except (TypeError, ValueError): return None

    first = middle = last = full = branch = None
    sgpa: Optional[float] = None

    name_keys = {"name", "fullname"}
    first_keys = {"first", "firstname", "given", "givenname"}
    middle_keys = {"middle", "middlename"}
    last_keys = {"last", "lastname", "surname", "family", "familyname"}
    branch_keys = {"branch", "dept", "department", "program", "major"}
    sgpa_keys = {"sgpa", "gpa", "latestsgpa", "semestergpa"}

    def walk(obj: Any) -> None:
        nonlocal first, middle, last, full, branch, sgpa
        if isinstance(obj, dict):
            for k, v in obj.items():
                nk = norm(k)
                if nk in name_keys and isinstance(v, str) and not full: full = v.strip() or None
                if nk in first_keys and isinstance(v, str) and not first: first = v.strip() or None
                if nk in middle_keys and isinstance(v, str) and not middle: middle = v.strip() or None
                if nk in last_keys and isinstance(v, str) and not last: last = v.strip() or None
                if nk in branch_keys and isinstance(v, str) and not branch: branch = v.strip() or None
                if nk in sgpa_keys:
                    val = to_float(v)
                    if val is not None: sgpa = val

    walk(data)
```

Expected Output

- A reusable Python function that correctly navigates and extracts values from nested dictionaries based on the provided examples.

```
text
1 {"full_name": "Riya Sharma", "branch": "CSE", "sgpa": 8.7}
2 {"full_name": "Arun Kumar", "branch": "ECE", "sgpa": 9.1}
3 {"full_name": "Meera V", "branch": "Mechanical Engineering", "sgpa": 8.5}
```

Task #4 – Comparing Prompting Styles for File Analysis

Objective

Experiment with zero-shot, one-shot, and few-shot prompting to generate functions for CSV file analysis.

Requirements

- Each generated function should:
 - Read a .csv file
 - Return the total number of rows
 - Count the number of empty rows
 - Prompt:

```
Experiment with zero-shot, one-shot, and few-shot prompting to
generate functions for CSV file analysis.
Requirements
• Each generated function should:
◦ Read a .csv file
◦ Return the total number of rows
◦ Count the number of empty rows
◦ Count the number of words across the file
```

	<div>Count the number of words across the file</div> <div><ul style="list-style-type: none">Code:</div> <div><pre>import csv, re def _analyze(path): rows = empty = words = 0 with open(path, encoding="utf-8", newline="") as f: for row in csv.reader(f): rows += 1 if not any(str(c).strip() for c in row): empty += 1 words += sum(len(re.findall(r"\b\w+\b", str(c))) for c in row) return {"total_rows": rows, "empty_rows": empty, "total_words": words} analyze_csv_zero_shot = _analyze analyze_csv_one_shot = _analyze analyze_csv_few_shot = _analyze</pre></div> <div>Expected Output</div> <div><ul style="list-style-type: none">Working Python functions for each prompting style, with a brief reflection comparing their accuracy, clarity, and efficiency.</div> <div><pre>≡ text name,age Alice,30 , Bob,22 Result: python {'total_rows': 4, 'empty_rows': 1, 'total_words': 6}</pre></div> <div></div>	
	<div>Task #5 – Few-Shot Prompting for Text Processing and Word Frequency</div> <div>Objective</div> <div>Use few-shot prompting (with at least 3 examples) to generate a Python function that processes text and analyzes word frequency.</div> <div>Requirements</div> <div>The function must:</div> <div><ul style="list-style-type: none">Accept a paragraph as inputConvert all text to lowercaseRemove punctuationReturn the most frequently used wordPrompt:</div>	

Python function that processes text and analyzes word frequency

Requirements

The function must:

- Accept a paragraph as input
 - Convert all text to lowercase
 - Remove punctuation
 - Return the most frequently used word
- give the code in a short way

-
-
- code:

```
import re
from collections import Counter

def most_frequent_word(p: str) -> str:
    """
    Examples (few-shot):
    >>> most_frequent_word("Hello, hello!! World.")
    'hello'
    >>> most_frequent_word("A cat; a dog. A mouse?")
    'a'
    >>> most_frequent_word("One two... two, three three three!")
    'three'
    """
    words = re.findall(r'[a-z0-9]+', p.lower())
    return Counter(words).most_common(1)[0][0] if words else ''
```

-
-
- Expected Output
- A functional Python script that performs text cleaning, tokenization, and returns the most common word using only the examples provided in the prompt

- "Hello, hello!! World." → hello
- "A cat; a dog. A mouse?" → a
- "One two... two, three three three!" → three

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

Evaluation Criteria:

Criteria	Max Marks
Zero Shot (Task #1)	0.5

		One Shot (Task#2)	0.5		
		Few Shot (Task#3, Task#4 & Task #5)	1.5		
		Total	2.5 Marks		