AI LAB ASSIGNMENT-4.1

Task #1 – Zero-Shot Prompting with Conditional Validation

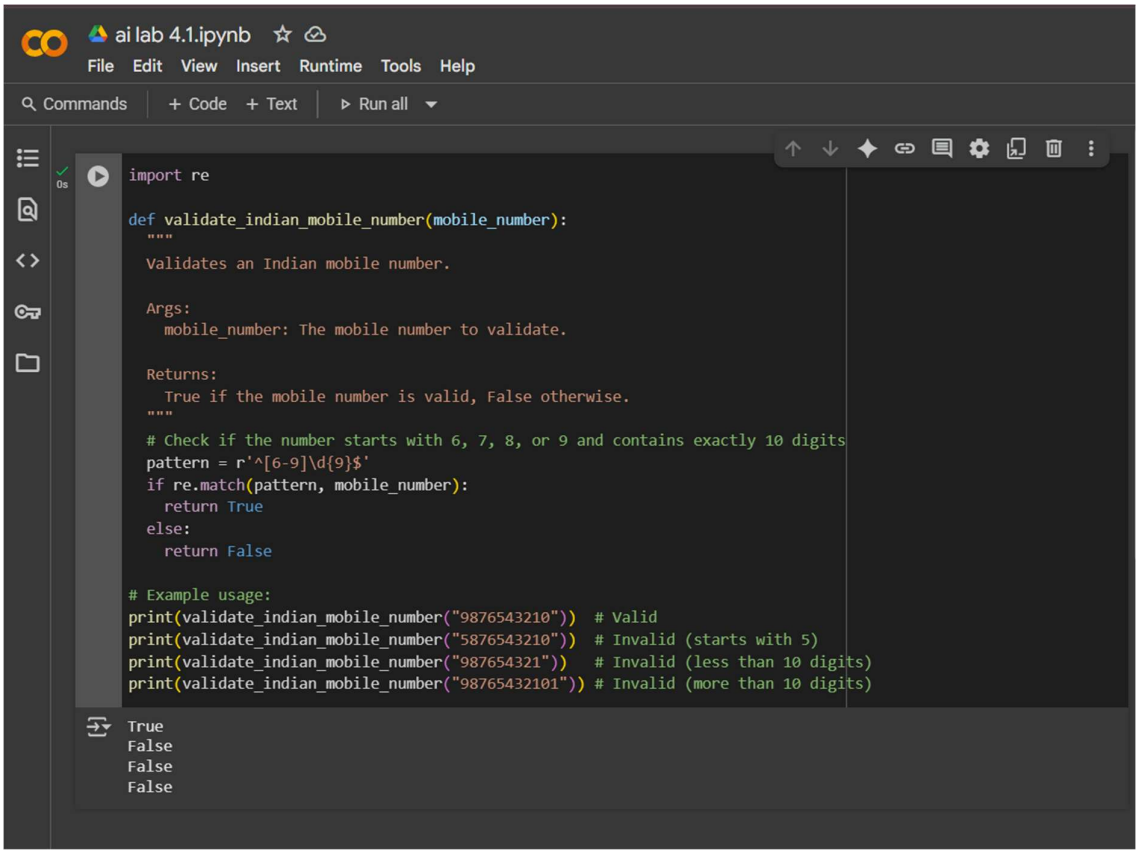
Objective

Use zero-shot prompting to instruct an AI tool to generate a function that validates an Indian mobile number.

Requirements

- The function must ensure the mobile number:
    - Starts with 6, 7, 8, or 9
    - Contains exactly 10 digits

Code:



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

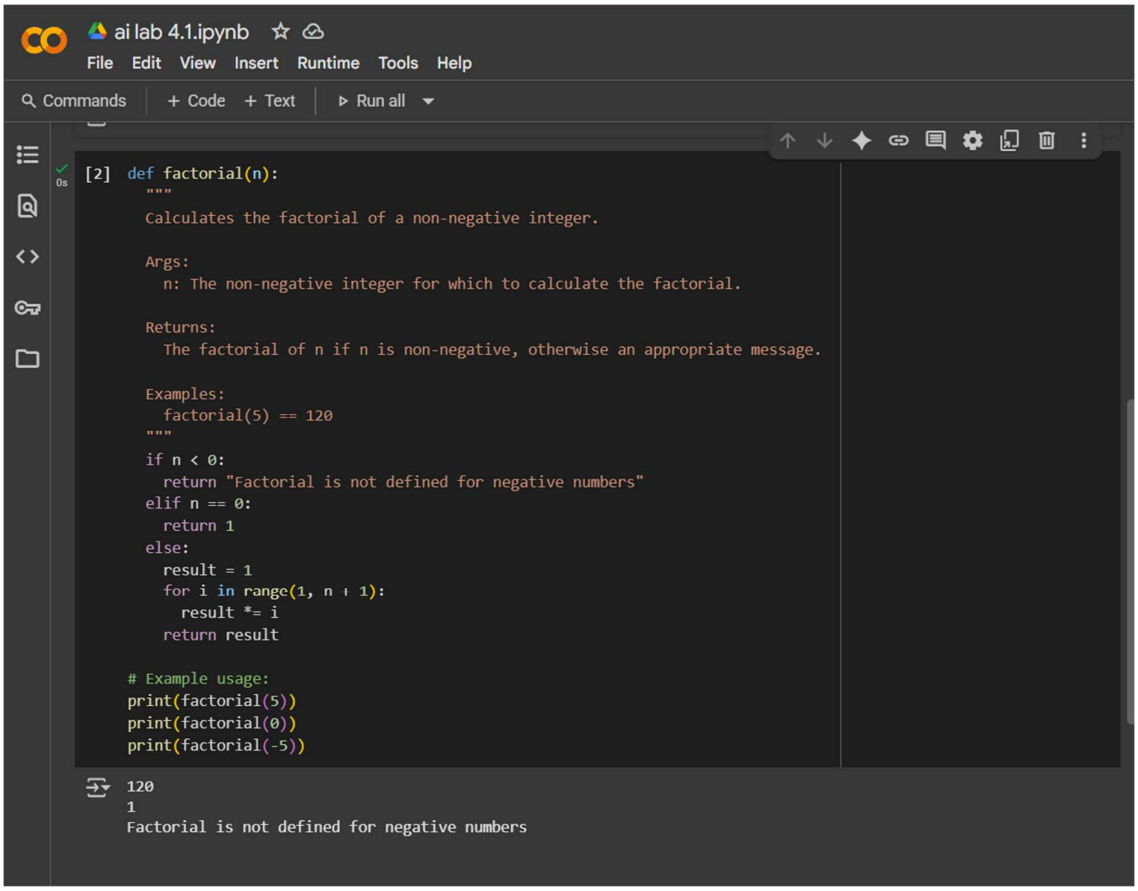
Objective

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

Code:



Task #3 – Few-Shot Prompting for Nested Dictionary Extraction

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

CODE:

ai lab 4.1.ipynb

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```
def extract_student_info(student_data):
    """
    Extracts Full Name, Branch, and SGPA from a nested dictionary of student information.

    Args:
      student_data: A dictionary containing student information.

    Returns:
      A dictionary containing the extracted Full Name, Branch, and SGPA.

    Examples:
      >>> student1 = {
      ...     "student_id": "S101",
      ...     "personal_info": {
      ...         "name": {
      ...             "first": "Alice",
      ...             "last": "Smith"
      ...         },
      ...         "contact": {
      ...             "email": "alice.smith@example.com",
      ...             "phone": "123-456-7890"
      ...         }
      ...     },
      ...     "academic_info": {
      ...         "branch": "Computer Science",
      ...         "sgpa": 8.5,
      ...         "courses": ["CS101", "MA101"]
      ...     }
      ... }
      >>> extract_student_info(student1)
      {'Full Name': 'Alice Smith', 'Branch': 'Computer Science', 'SGPA': 8.5}
```

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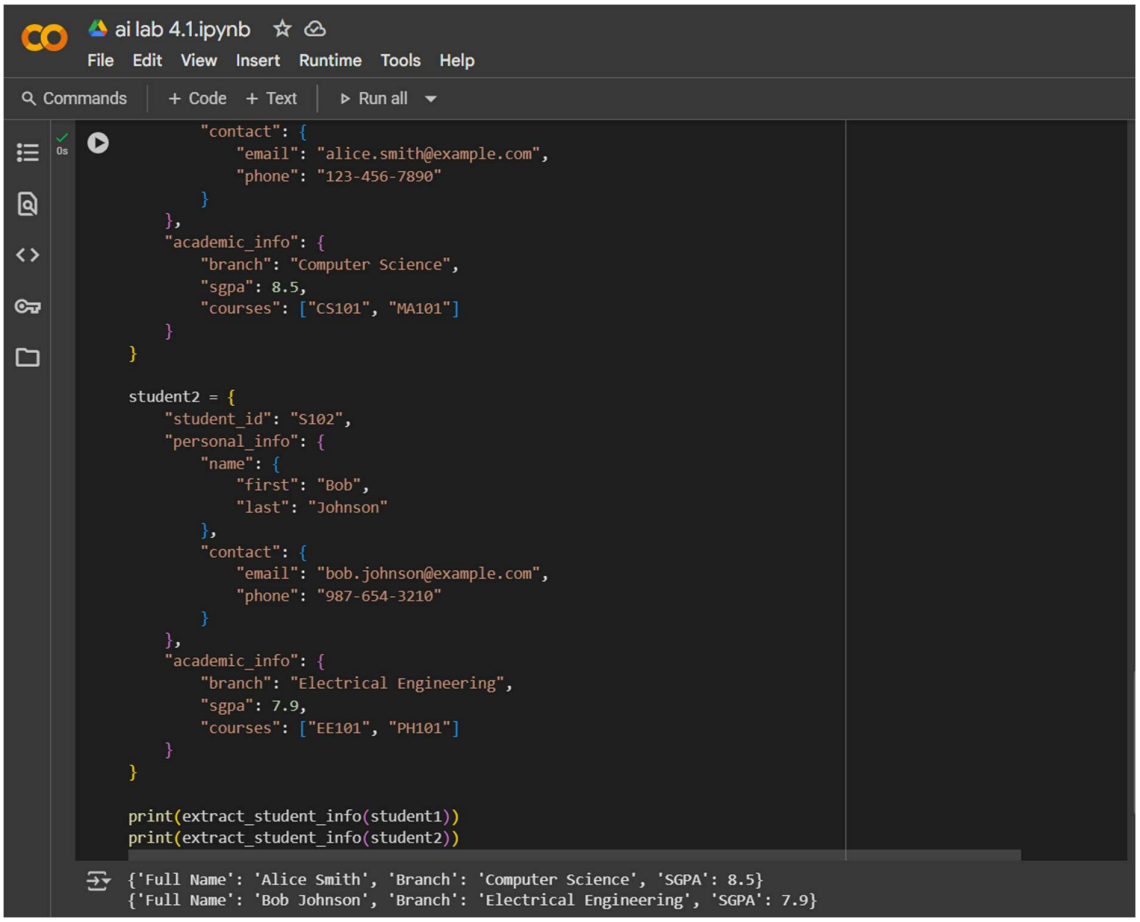
```
      >>> student2 = {
      ...     "student_id": "S102",
      ...     "personal_info": {
      ...         "name": {
      ...             "first": "Bob",
      ...             "last": "Johnson"
      ...         },
      ...         "contact": {
      ...             "email": "bob.johnson@example.com",
      ...             "phone": "987-654-3210"
      ...         }
      ...     },
      ...     "academic_info": {
      ...         "branch": "Electrical Engineering",
      ...         "sgpa": 7.9,
      ...         "courses": ["EE101", "PH101"]
      ...     }
      ... }
      >>> extract_student_info(student2)
      {'Full Name': 'Bob Johnson', 'Branch': 'Electrical Engineering', 'SGPA': 7.9}
    """
    full_name = student_data["personal_info"]["name"]["first"] + " " + student_data["personal_info"]["name"]["la
    branch = student_data["academic_info"]["branch"]
    sgpa = student_data["academic_info"]["sgpa"]

    return {"Full Name": full_name, "Branch": branch, "SGPA": sgpa}

# Example usage:
student1 = {
    "student_id": "S101",
    "personal_info": {
        "name": {
            "first": "Alice",
            "last": "Smith"
        },
```



Task #5 – Few-Shot Prompting for Text Processing and Word Frequency

Objective

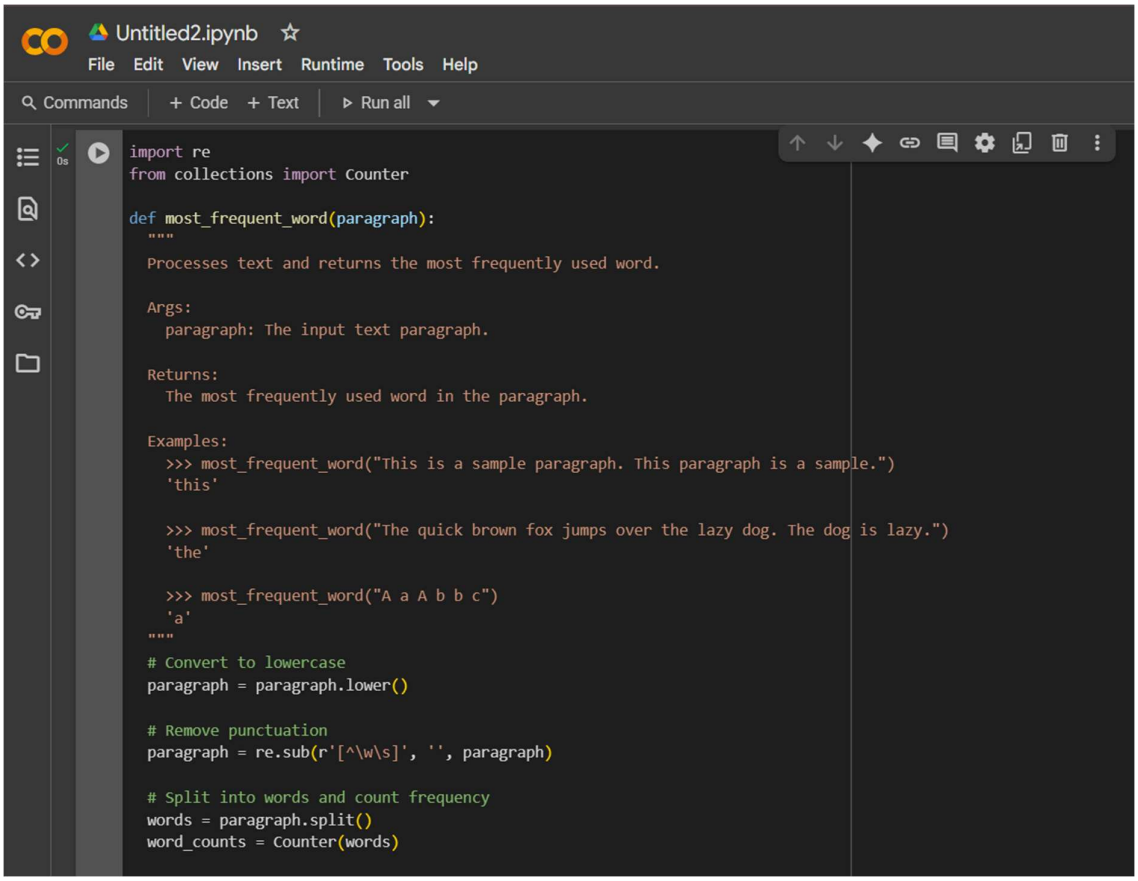
Use few-shot prompting (with at least 3 examples) to generate a Python function that processes text and analyzes word frequency.

Requirements

The function must:

- **Accept a paragraph as input**
- **Convert all text to lowercase**
- **Remove punctuation**
- **Return the most frequently used word**

Code: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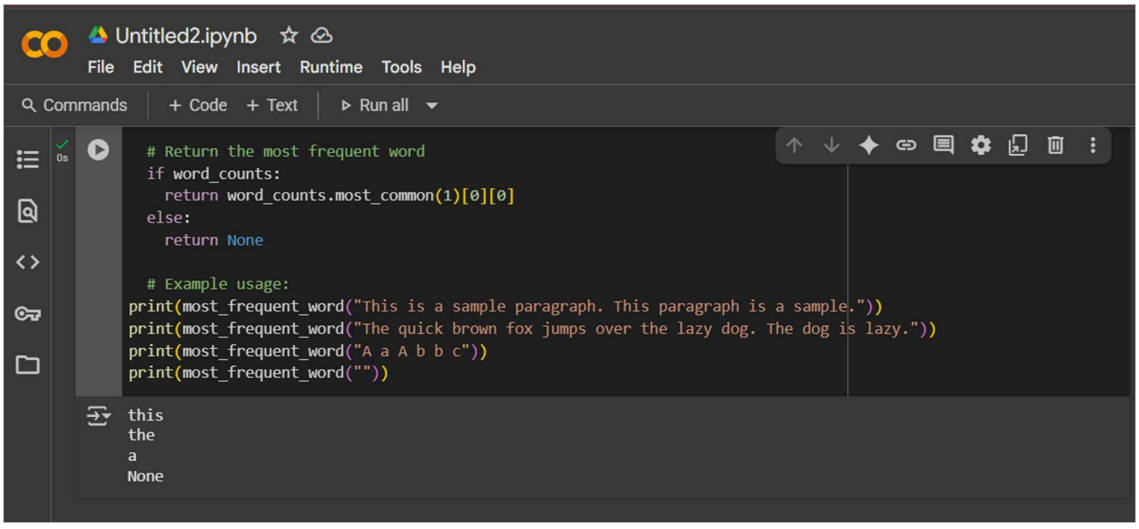
import re
from collections import Counter
def most_frequent_word(paragraph):
"""
Processes text and returns the most frequently used word.
Args:
paragraph: The input text paragraph.
Returns:
The most frequently used word in the paragraph.
Examples:
>>> most_frequent_word("This is a sample paragraph. This paragraph is a sample.")
'this'
>>> most_frequent_word("The quick brown fox jumps over the lazy dog. The dog is lazy.")
'the'
>>> most_frequent_word("A a A b b c")
'a'
"""
# Convert to lowercase
paragraph = paragraph.lower()
# Remove punctuation
paragraph = re.sub(r'[^\w\s]', '', paragraph)
# Split into words and count frequency
words = paragraph.split()
word_counts = Counter(words)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# Return the most frequent word
if word_counts:
return word_counts.most_common(1)[0][0]
else:
return None
# Example usage:
print(most_frequent_word("This is a sample paragraph. This paragraph is a sample."))
print(most_frequent_word("The quick brown fox jumps over the lazy dog. The dog is lazy."))
print(most_frequent_word("A a A b b c"))
print(most_frequent_word(""))
this
the
a
None