Assignment 3.1

# Lab Experiment: Prompt Engineering – Improving Prompts and Context Management

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* Date –
* Subject – AI Assisted Coding
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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

Procedure :

1. Select a simple task: "Write a Python function to check if a  
number is prime."

2. Use different prompting strategies to generate the solution:  
a) Zero-Shot – no examples.  
b) One-Shot – one example provided.  
c) Few-Shot – multiple examples provided.  
d) Context-Managed – detailed prompt with constraints  
and instructions.

3. Record AI responses and refine prompts to improve code  
quality.

4. Request AI to optimize the logic for efficiency.

5. Compare results and document improvements.

1. Sample Prompts :

● Zero-Shot:  
Write a Python function to check if a number is prime.

● One-Shot:  
Example: Input: 5 → Output: Prime. Now, write a function  
to check if a number is prime.

● Few-Shot:  
Example 1: Input: 7 → Output: Prime

Example 2: Input: 10 → Output: Not Prime  
Example 3: Input: 2 → Output: Prime  
Generate the function accordingly.

● Context-Managed (With Optimization)

Task : Mobile Data Usage Billing Application –

Use Python programming and AI-assisted coding tools to create an application that simulates mobile data billing for a telecom service provider.

Instructions :

1. Use GitHub Copilot or Google Gemini to assist in writing the  
program.

2. Read the following inputs from the user:  
o Data Consumed (in GB)  
o Plan Type (Prepaid / Postpaid)  
o Additional Services Used (e.g., caller tune, OTT  
subscription, etc.)

3. Implement billing logic to calculate:  
o DC (Data Charges) – charges based on data  
consumption  
o VC (Value-added Charges) – charges for additional  
services  
o Tax – applicable tax on the total bill

4. Display an itemized bill showing:  
o Plan Type  
o Data Usage and Charges  
o Value-added Services and Charges  
o Tax  
o Total Bill Amount

Requirements:

● Students must refer to their actual mobile bill for charge  
structure (data cost, service fees, taxes) to make the program realistic.  
● AI assistance (Copilot/Gemini) must be used to generate and  
refine the initial code.

Deliverables:

● AI prompts used for code generation.  
● AI-generated Python code and any optimized version.  
● Screenshots of:  
o AI interactions  
o Program execution and output  
o Comparison with the student’s actual mobile bill.

Task: Develop an LPG Billing System

Apply your Python programming skills and utilize AI-assisted  
coding tools to build an application that calculates the LPG bill  
based on specified customer inputs and billing parameters

Instructions:

1. Use GitHub Copilot or Google Gemini to assist in writing and refining the program.

2. Read the following user inputs:  
o Cylinder Type (Domestic 14.2 kg / Domestic 5 kg /  
Commercial 19 kg / Commercial 47.5 kg)  
o Number of Cylinders Booked  
o Subsidy Amount (applicable only for domestic  
cylinders)  
3. Refer to the given LPG Price List to determine the price per  
cylinder:  
o Domestic LPG (14.2 kg) → ₹905.00  
o Domestic LPG (5 kg) → ₹335.50  
o Commercial LPG (19 kg) → ₹1,886.50  
o Commercial LPG (47.5 kg) → ₹4,712.00

o Delivery Charges (₹10 to ₹50)

4. Implement the billing formula:  
Bill Amount = (Price per Cylinder × Quantity) - Subsidy (if applicable) + Delivery Charges

5. Calculate and display an itemized bill including:  
● Cylinder Type  
● Number of Cylinders  
● Base Amount  
● Subsidy  
● Delivery Charges  
● Total Bill Amount

Deliverables :   
● A report containing:  
o AI prompts used to generate the program  
o AI-generated Python code  
o Line-by-line explanation of the code