# Lab Assignment 3.1 - AI Assisted Coding

## Task 1: Prompt Engineering – Improving Prompts and Context Management

Objective: To explore how prompt design and context influence AI-generated outputs and to learn techniques to improve AI responses.

### Zero-Shot Prompt

Prompt: Write a Python function to check if a number is prime.

#### Code

def is\_prime(n):  
 if n <= 1:  
 return False  
 for i in range(2, int(n\*\*0.5) + 1):  
 if n % i == 0:  
 return False  
 return True  
  
print(is\_prime(5)) # True

A screen shot of a computer

AI-generated content may be incorrect.

### One-Shot Prompt

Prompt: Example: Input: 5 → Output: Prime. Now, write a function to check if a number is prime.

#### Code

def is\_prime(n):  
 if n <= 1:  
 return "Not Prime"  
 for i in range(2, int(n\*\*0.5) + 1):  
 if n % i == 0:  
 return "Not Prime"  
 return "Prime"  
  
print(is\_prime(10)) # Not Prime

A screenshot of a computer

AI-generated content may be incorrect.

### Few-Shot Prompt

Prompt: Example 1: Input: 7 → Output: Prime  
Example 2: Input: 10 → Output: Not Prime  
Example 3: Input: 2 → Output: Prime  
Generate the function accordingly.

#### Code

def is\_prime(n):  
 if n <= 1:  
 return "Not Prime"  
 for i in range(2, int(n\*\*0.5) + 1):  
 if n % i == 0:  
 return "Not Prime"  
 return "Prime"  
  
print(is\_prime(7)) # Prime  
print(is\_prime(10)) # Not Prime

A screen shot of a computer

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### Context-Managed Prompt

Prompt: Write an optimized Python function to check if a number is prime. Ensure it handles edge cases and is efficient.

#### Code

def is\_prime(n):  
 if n < 2:  
 return False  
 if n in (2, 3):  
 return True  
 if n % 2 == 0 or n % 3 == 0:  
 return False  
 i = 5  
 while i \* i <= n:  
 if n % i == 0 or n % (i + 2) == 0:  
 return False  
 i += 6  
 return True  
  
print(is\_prime(97)) # True

A screenshot of a computer program

AI-generated content may be incorrect.

## Task 2: Mobile Data Usage Billing Application

Objective: Create an application that simulates mobile data billing for a telecom service provider.

### Prompt

Generate a Python program that calculates mobile data billing with user inputs for data consumed (GB), plan type (Prepaid/Postpaid), and additional services.

#### Code

def mobile\_billing(data\_gb, plan\_type, services\_cost):  
 rate\_per\_gb = 10 if plan\_type.lower() == "prepaid" else 8  
 data\_charges = data\_gb \* rate\_per\_gb  
 value\_added = services\_cost  
 subtotal = data\_charges + value\_added  
 tax = subtotal \* 0.18  
 total = subtotal + tax  
  
 print("---- Mobile Bill ----")  
 print("Plan Type:", plan\_type)  
 print("Data Consumed:", data\_gb, "GB")  
 print("Data Charges: ₹", data\_charges)  
 print("Value Added Services: ₹", value\_added)  
 print("Tax: ₹", round(tax, 2))  
 print("Total Bill: ₹", round(total, 2))  
  
# Example execution  
mobile\_billing(15, "Prepaid", 100)

### Sample Output

---- Mobile Bill ----  
Plan Type: Prepaid  
Data Consumed: 15 GB  
Data Charges: ₹ 150  
Value Added Services: ₹ 100  
Tax: ₹ 45.0  
Total Bill: ₹ 295.0

A screen shot of a computer

AI-generated content may be incorrect.

## Task 3: LPG Billing System

Objective: Build an application that calculates the LPG bill based on cylinder type, subsidy, and delivery charges.

### Prompt

Generate a Python program to calculate LPG bill based on cylinder type, quantity, subsidy (if applicable), and delivery charges.

#### Code

def lpg\_billing(cylinder\_type, qty, subsidy, delivery):  
 prices = {  
 "Domestic 14.2 kg": 905.00,  
 "Domestic 5 kg": 335.50,  
 "Commercial 19 kg": 1886.50,  
 "Commercial 47.5 kg": 4712.00  
 }  
  
 base\_price = prices[cylinder\_type] \* qty  
 total = base\_price - subsidy + delivery  
  
 print("---- LPG Bill ----")  
 print("Cylinder Type:", cylinder\_type)  
 print("Quantity:", qty)  
 print("Base Price: ₹", base\_price)  
 print("Subsidy: ₹", subsidy)  
 print("Delivery Charges: ₹", delivery)  
 print("Total Bill: ₹", total)  
  
# Example execution  
lpg\_billing("Domestic 14.2 kg", 2, 100, 30)

### Sample Output

---- LPG Bill ----  
Cylinder Type: Domestic 14.2 kg  
Quantity: 2  
Base Price: ₹ 1810.0  
Subsidy: ₹ 100  
Delivery Charges: ₹ 30  
Total Bill: ₹ 1740.0

A computer screen shot of a program

AI-generated content may be incorrect.