

# **AI Assisted Coding (III Year) Assignment**

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## **LAB ASSIGNMENT – 4.2**

### **Advanced Prompt Engineering: Zero-shot, One-shot, and Few-shot Techniques**

#### ***Lab Objectives:***

- To apply different types of prompting techniques in AI-assisted tasks.
- To understand zero-shot, one-shot, and few-shot prompting methods.
- To study how examples and context affect AI output quality.

#### ***Lab Outcomes:***

After completing this lab, students will be able to:

- Use zero-shot prompting with minimal instructions.
- Use one-shot prompting with a single example.
- Use few-shot prompting with multiple examples.
- Compare outputs of different prompting strategies.

#### ***Introduction***

Prompt engineering is a technique used to guide Artificial Intelligence systems using well-designed instructions called prompts. Instead of training a new machine learning model, prompt engineering uses an existing large language model to perform tasks such as classification and analysis.

In this lab, three prompting techniques are studied:

1. Zero-shot prompting
2. One-shot prompting
3. Few-shot prompting

*These techniques are applied to different real-world classification problems.*

### ***Sample Example Problem: News Headline Classification***

#### ***Problem Statement***

*A news platform wants to classify news headlines into:*

- *Politics*
- *Sports*
- *Technology*
- *Entertainment*

*This is done using prompt engineering without training a model.*

#### ***Sample News Headlines***

1. *Government announces new education policy – Politics*
2. *Parliament passes new tax reform bill – Politics*
3. *India wins the T20 cricket series – Sports*
4. *Football club signs a new international player – Sports*
5. *Tech company launches a new AI-powered smartphone – Technology*
6. *Cybersecurity firm reports major data breach – Technology*
7. *Upcoming movie breaks box office records – Entertainment*
8. *Popular actor announces next film project – Entertainment*

#### ***Zero-shot Prompting***

##### ***Prompt:***

*Classify the following headline into Politics, Sports, Technology, or Entertainment.*

***Headline:*** *India wins the T20 cricket series.*

***Output:*** *Sports*

##### ***Observation:***

*The model classified the headline correctly without any examples.*

#### ***One-shot Prompting***

**Prompt:**

**Example:**

**Headline:** Government announces new education policy

**Category:** Politics

**Classify the following headline:**

Tech company launches a new AI-powered smartphone.

**Output:** Technology

**Observation:**

Providing one example improved clarity.

### **Few-shot Prompting**

**Prompt:**

Headline: Parliament passes new tax reform bill – Politics

Headline: Football club signs a new international player – Sports

Headline: Cybersecurity firm reports major data breach – Technology

Headline: Upcoming movie breaks box office records – Entertainment

*Classify: Popular actor announces next film project.*

**Output:** Entertainment

**Observation:**

Few-shot prompting gave the most accurate result.

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### **Problem Statement 1: Customer Email Classification**

#### **Categories**

- Billing
- Technical Support
- Feedback
- Others

#### **Sample Emails**

1. I was charged twice for my subscription – Billing
2. Payment failed but money was deducted – Billing
3. The app crashes when I try to login – Technical Support
4. Your customer service is excellent – Feedback

5. What are your office working hours? – Others

#### **Zero-shot Prompt**

*Classify the email into Billing, Technical Support, Feedback, or Others.*

*Email: I have not received my invoice for this month.*

**Output: Billing**

#### **One-shot Prompt**

*Email: The app crashes during login – Technical Support*

*Classify: I have not received my invoice for this month.*

**Output: Billing**

#### **Few-shot Prompt**

*Email: Payment failed but money was deducted – Billing*

*Email: The app crashes while opening – Technical Support*

*Email: Great customer service – Feedback*

*Classify: I have not received my invoice for this month.*

**Output: Billing**

#### **Observation**

Few-shot prompting gave better and more consistent results.

#### **Problem Statement 2: Intent Classification for Chatbot Queries**

##### *Intents*

- Account Issue
- Order Status
- Product Inquiry
- General Question

##### **Sample Queries**

1. *I forgot my account password* – Account Issue
2. *Where is my order?* – Order Status
3. *Does this phone support 5G?* – Product Inquiry
4. *How do I contact customer support?* – General Question
5. *My account is locked* – Account Issue
6. *When will my order arrive?* – Order Status

## **Results**

- *Zero-shot output: Order Status*
- *One-shot output: Order Status*
- *Few-shot output: Order Status*

## **Observation:**

*Few-shot prompting reduced confusion between intents.*

## **Problem Statement 3: Student Feedback Analysis**

### **Categories**

- *Positive*
  - *Negative*
  - *Neutral*
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- *Zero-shot output: Positive*
  - *One-shot output: Positive*
  - *Few-shot output: Positive*

## **Observation:**

*Providing examples improved sentiment understanding.*

## **Problem Statement 4: Course Recommendation System**

### **Levels**

- *Beginner*
- *Intermediate*

- Advanced

**Zero-shot output:** Beginner

- One-shot output: Beginner
- Few-shot output: Beginner

**Observation:**

Few-shot prompting improved recommendation accuracy.

**Problem Statement 5:** Social Media Post Moderation

**Categories**

- Acceptable
  - Offensive
  - Spam
- 
- Zero-shot output: Spam
  - One-shot output: Spam
  - Few-shot output: Spam

**Observation:**

Few-shot prompting performed better than zero-shot.

**Conclusion**

This lab shows that prompt engineering is an effective way to use AI without training new models. Zero-shot prompting works for simple tasks. One-shot prompting improves clarity. Few-shot prompting gives the most accurate and reliable results. Therefore, few-shot prompting is the best approach for complex real-world problems.