LAB ASSIGNMENT – 4

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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.

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

- 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.