# *AI Assisted Coding (III Year) Assignment*

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## *LAB ASSIGNMENT – 4*

## 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*

- *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.*