AI ASSISTED CODING ASS-4.1

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B-28

Problem Statement -1

Customer Email Classification

A company receives a large number of customer emails every day and wants to automatically classify them into the following categories:

- **Billing**
- **Technical Support**
- **Feedback**
- **Others**

Instead of training a new machine learning model, the company decides to use prompt engineering techniques with an existing large language model.

Customer Email Classification Using Prompt Engineering

A company wants to classify incoming customer emails into the following categories **without training a new ML model**, by using **prompt engineering with a Large Language Model (LLM)**.

Categories:

- Billing
- Technical Support
- Feedback
- Others

Task 1: Sample Customer Emails

Below are **five short sample emails**, each clearly belonging to a category.

1. **Billing**
   “I was charged twice for my subscription this month. Please check my invoice and issue a refund if needed.”
2. **Technical Support**
   “The mobile app crashes every time I try to upload a file. I’ve already reinstalled it but the issue persists.”
3. **Feedback**
   “I really like the new dashboard design. It’s much easier to navigate than the previous version.”
4. **Others**
   “I would like to know your office working hours during public holidays.”
5. **Billing (additional example)**
   “Can you explain the extra service charge added to my last bill?”

Task 2: Zero-Shot Prompt Definition:
Zero-shot prompting means **no examples are provided**. The model relies only on instructions.

Zero-Shot Prompt

Classify the following customer email into one of these categories: Billing,

Technical Support, Feedback, or Others.

Email:

"I was charged twice for my subscription this month. Please check my invoice."

Return only the category name.

Expected Output

Billing

Task 3: One-Shot Prompt Definition:
One-shot prompting provides **one labeled example** before asking the model to classify a new email.

One-Shot Prompt

Example:

Email: "The app crashes whenever I try to log in." Category:

Technical Support

Now classify the following email into one of these categories: Billing,

Technical Support, Feedback, or Others.

Email:

"I was charged twice for my subscription this month. Please check my invoice."

Return only the category name.

Expected Output

Billing

Task 4: Few-Shot Prompt Definition:

Few-shot prompting includes **two or three labeled examples**, giving the model better context.

Few-Shot Prompt

Examples:

Email: "I was charged extra on my credit card this month."

Category: Billing

Email: "The website is not loading on my browser." Category:

Technical Support

Email: "Your customer service team was very helpful."

Category: Feedback

Now classify the following email into one of these categories: Billing,

Technical Support, Feedback, or Others.

Email:

"I would like to know your office working hours during public holidays." Return only the category name.

Expected Output

Others

Task 5: Comparison of Zero-Shot, One-Shot, and Few-Shot Prompting

Prompting Technique	**Effectiveness**	**Explanation**
Zero-Shot	Moderate	Works well for simple and clear emails, but may struggle with ambiguous cases.
One-Shot	Good	The single example helps guide the model and improves classification accuracy.
Few-Shot	Very High	Multiple examples provide strong context, resulting in the most accurate and consistent classifications.

Problem Statement -2

Intent Classification for Chatbot Queries

A company wants to deploy a chatbot to handle customer queries. Each query must be classified into one of the following intents: Account Issue, Order Status, Product Inquiry, or General Question using prompt engineering techniques.

Intent Classification for Chatbot Queries Using Prompt Engineering

A company plans to deploy a chatbot to automatically classify customer queries into the following **intent categories**:

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

Instead of training a new machine learning model, **prompt engineering with a Large Language Model (LLM)** is used.

Task 1: Prepare Sample Data

Below are **6 short chatbot user queries**, each mapped to one of the four intents.

Query	Intent
“I forgot my account password and can’t log in.”	Account Issue
“My account was locked after multiple login attempts.”	Account Issue
“Where is my order? It was supposed to arrive yesterday.”	Order Status
“Can you tell me if my order has been shipped?”	Order Status
“Does this laptop support fast charging?”	Product Inquiry
“What are your customer support working hours?”	General Question

Task 2: Zero-Shot Prompting

Definition:
Zero-shot prompting asks the model to perform classification **without providing any examples**.

Zero-Shot Prompt

Classify the following user query into one of these intents: Account

Issue, Order Status, Product Inquiry, or General Question.

User Query:

"Where is my order? It was supposed to arrive yesterday."

Return only the intent name.

Expected Output

Order Status

Task 3: One-Shot Prompting

Definition:
One-shot prompting provides **one labeled example** to guide the model.

One-Shot Prompt

Example:

User Query: "I forgot my password and cannot access my account." Intent:

Account Iss

Now classify the following user query into one of these intents:

Account Issue, Order Status, Product Inquiry, or General Question.

User Query:

"Where is my order? It was supposed to arrive yesterday."

Return only the intent name.

Expected Output

Order Status

Task 4: Few-Shot Prompting

Definition:
Few-shot prompting includes **multiple labeled examples (3–5)** to provide strong contextual guidance.

Few-Shot Prompt

Examples:

User Query: "I forgot my password and cannot access my account." Intent:

Account Issue

User Query: "My account was locked after too many login attempts." Intent:

Account Issue

User Query: "Has my order been shipped yet?" Intent:

Order Status

User Query: "Does this phone support wireless charging?"

Intent: Product Inquiry

Now classify the following user query into one of these intents:

Account Issue, Order Status, Product Inquiry, or General Question.

User Query:

"What are your customer support working hours?"

Return only the intent name.

Expected Output

General Question

Task 5: Evaluation and Comparison

The **same test queries** were classified using zero-shot, one-shot, and few-shot prompting.

Prompting Technique	**Accuracy**	**Observations**
Zero-Shot	Moderate	Works well for very clear queries but may misclassify ambiguous ones.
One-Shot	Good	The example improves intent understanding and reduces confusion.
Few-Shot	Very High	Multiple examples provide strong context, leading to the most consistent and accurate results.

Problem Statement -3

Student Feedback Analysis

A university collects student feedback and wants to categorize comments as Positive, Negative, or Neutral.

Student Feedback Analysis Using Prompt Engineering

A university wants to automatically classify student feedback into the following **sentiment categories**:

- **Positive**
- **Negative**
- **Neutral**

Instead of training a machine learning model, **prompt engineering with a Large Language Model (LLM)** is used.

a) Zero-Shot Prompt

Explanation:
In zero-shot prompting, **no examples are given**. The model classifies the feedback based only on the instruction.

Zero-Shot Prompt

Classify the sentiment of the following student feedback as Positive,

Negative, or Neutral.

Feedback:

"The course content was interesting, but the pace was too fast." Return

only the sentiment label.

Expected Output

Neutral

b) One-Shot Prompt

Explanation:
One-shot prompting provides **one labeled example** to guide the model.

One-Shot Prompt

Example:

Feedback: "The professor explained the concepts very clearly."

Sentiment: Positive

Now classify the sentiment of the following feedback as

Positive, Negative, or Neutral.

Feedback:

"The course content was interesting, but the pace was too fast." Return

only the sentiment label.

Expected Output

Neutral

c) Few-Shot Prompt

Explanation:
Few-shot prompting provides **multiple labeled examples**, giving the model stronger context.

Few-Shot Prompt

Examples:

Feedback: "The lectures were engaging and well organized."

Sentiment: Positive

Feedback: "The syllabus is outdated and difficult to follow."

Sentiment: Negative

Feedback: "The classes were held as scheduled."

Sentiment: Neutral

Now classify the sentiment of the following feedback as

Positive, Negative, or Neutral.

Feedback:

"The course content was interesting, but the pace was too fast." Return

only the sentiment label.

Expected Output

Neutral

d) How Examples Improve Sentiment Classification Accuracy

- **Zero-shot prompting** relies entirely on the model's general understanding and may misclassify mixed or ambiguous feedback.
- **One-shot prompting** helps the model understand the task format and improves consistency.
- **Few-shot prompting** provides clear patterns for each sentiment, helping the model handle mixed opinions and subtle language more accurately.

Problem Statement -4

Course Recommendation System

An online learning platform wants to recommend courses by

classifying learner queries into Beginner, Intermediate, or Advanced levels.

Course Recommendation System Using Prompt Engineering

An online learning platform wants to recommend suitable courses by classifying learner queries into the following **difficulty levels**:

- **Beginner**
- **Intermediate**
- **Advanced**

Instead of building a new machine learning model, the platform uses **prompt engineering with a Large Language Model (LLM)**.

a) Zero-Shot Prompt

Explanation:
Zero-shot prompting performs classification **without providing any examples**.

Zero-Shot Prompt

Classify the following learner query into one of these levels: Beginner,

Intermediate, or Advanced.

Learner Query:

"I want to learn Python from scratch with no prior experience."

Return only the level name.

Expected Output

Beginner

b) One-Shot Prompt

Explanation:
One-shot prompting provides **one labeled example** to guide the model.

One-Shot Prompt

Example:

Learner Query: "I am completely new to programming and want to start with Python."

Level: Beginner

Now classify the following learner query into one of these levels: Beginner,

Intermediate, or Advanced.

Learner Query:

"I want to learn Python from scratch with no prior experience."

Return only the level name.

Expected Output

Beginner

c) Few-Shot Prompt

Explanation:
Few-shot prompting provides **multiple labeled examples**, improving understanding and accuracy.

Few-Shot Prompt

Examples:

Learner Query: "I have never coded before and want to learn programming." Level:

Beginner

Learner Query: "I know basic Python and want to build small projects." Level:

Intermediate

Learner Query: "I am experienced in Python and want to learn advanced machine learning techniques."

Level: Advanced

Now classify the following learner query into one of these levels: Beginner,

Intermediate, or Advanced.

Learner Query:

"I want to learn Python from scratch with no prior experience."

Return only the level name.

Expected Output

Beginner

d) How Few-Shot Prompting Improves Recommendation Quality

- **Few-shot prompting** provides clear reference patterns for each learning level.
- It helps the model distinguish between subtle differences in learner experience.
- Ambiguous queries are classified more accurately.
- Course recommendations become more personalized and relevant.

Problem Statement -5

Social Media Post Moderation

A social media platform wants to classify posts into Acceptable, Offensive, or Spam.

Social Media Post Moderation Using Prompt Engineering

A social media platform wants to automatically classify user posts into the following **moderation categories**:

- **Acceptable**
- **Offensive**
- **Spam**

This task is handled using **prompt engineering with a Large Language Model (LLM)** instead of training a new classifier.

a) Zero-Shot Prompt for Post Moderation

Explanation:
Zero-shot prompting classifies content **without providing any labeled examples**.

Zero-Shot Prompt

Classify the following social media post into one of these categories: Acceptable, Offensive, or Spam.

Post:

"Buy cheap followers now! Visit our website for instant results."

Return only the category name.

Expected Output

Spam

b) One-Shot Prompt

Explanation:
One-shot prompting includes **one labeled example** to guide the model.

One-Shot Prompt

Example:

Post: "Click here to win a free smartphone!" Category:

Spam

Now classify the following social media post into one of these categories:

Acceptable, Offensive, or Spam.

Post:

"Buy cheap followers now! Visit our website for instant results."

Return only the category name.

Expected Output

Spam

c) Few-Shot Prompt

Explanation:
Few-shot prompting uses **multiple labeled examples** to provide strong context.

Few-Shot Prompt

Examples:

Post: "I love how helpful this community is." Category:

Acceptable

Post: "You are an idiot and don’t deserve to be here."

Category: Offensive

Post: "Win cash prizes instantly! Click the link now!" Category:

Spam

Now classify the following social media post into one of these categories:

Acceptable, Offensive, or Spam.

Post:

"Buy cheap followers now! Visit our website for instant results."

Return only the category name.

Expected Output

Spam

d) Challenges of Zero-Shot Prompting in Content Moderation

- **Lack of context** makes it difficult to handle ambiguous or sarcastic posts.
- Slang, cultural references, and evolving offensive language may be misinterpreted.
- Zero-shot models may confuse **strong opinions** with offensive content.
- Higher risk of **false positives or false negatives** compared to example-based prompting.