Assignment-4.4

2303A52393

Batch-43

Task-01:

a) Customer Reviews with Sentiment Labels

Customer Review

Sentiment

Label

The product quality is excellent and delivery was

fast.

Positive

Very bad experience, the item arrived damaged.

Negative

Customer support was helpful and polite.

Positive

The product is okay, nothing special.

Neutral

I am disappointed with the poor battery life.

Negative

The packaging was fine, but delivery was delayed. Neutral

b) Zero-Shot Prompt Design

Prompt:

Classify the sentiment of the following customer review as Positive,

Negative, or Neutral.

Review: *"The product quality is excellent and delivery was fast."*

Explanation:

In Zero-shot prompting, no examples are provided. The model

predicts sentiment based only on its pre-trained knowledge and

understanding of language.**c) One-Shot Prompt Design**

Prompt:

Classify the sentiment of the following customer review as Positive,

Negative, or Neutral.

Example:

Review: “The product is amazing and works perfectly.”

Sentiment: Positive

Review: “The item arrived damaged and late.”

Sentiment: Negative

Explanation:

One-shot prompting includes a single labeled example to guide the model toward the correct classification.

d) Few-Shot Prompt Design

Prompt:

Classify the sentiment of the following customer review as Positive, Negative, or Neutral.

Example 1:

Review: “Excellent product and fast delivery.”

Sentiment: Positive

Example 2:

Review: “The item was broken and customer service was rude.”

Sentiment: Negative

Example 3:

Review: “The product is average, nothing impressive.”

Sentiment: NeutralExample 4:

Review: “I love the design and performance.”

Sentiment: Positive

Review: “The packaging was fine but delivery was delayed.”

Sentiment: Negative or neutral

Explanation:

Few-shot prompting provides multiple labeled examples, allowing the model to understand sentiment patterns more accurately.

e) Comparison of Prompt Outputs and Accuracy

Prompt

Type

Accuracy

Level

Description

Zero-shot Medium

Works for clear sentiments but may

misclassify neutral reviews

One-shot High

Better guidance due to one labeled example

Few-shot Very High

Multiple examples reduce ambiguity and

improve prediction accuracy

Discussion:

Few-shot prompting performs best because it offers clear contextual understanding through multiple examples. It is especially effective for neutral or mixed-sentiment reviews.

Conclusion

This assignment demonstrates how prompt engineering techniques can be used for sentiment analysis in e-commerce platforms. Among Zero-shot, One-shot, and Few-shot prompting methods, Few-shot prompting provides the highest accuracy and reliability, making it the most suitable approach for real-world sentiment classification systems.**Task-02. Email Priority Classification**

1. Sample Email Messages with Priority Labels

Email Message

Priority

Label

“Our server is down and customers are unable to

access the website.”

High Priority

“Please find the attached report for last month’s

sales."

Medium

Priority

"Meeting scheduled for tomorrow has been

postponed."

Medium

Priority

"Urgent: Payment failure affecting multiple

transactions."

High Priority

"Reminder to submit timesheets by end of the week." Low Priority

"Happy holidays to the entire team!"

Low Priority

2. Zero-Shot Prompting for Email Priority Classification

Prompt:

Classify the priority of the following email as **High Priority,**

Medium Priority, or Low Priority.

Email: *"Our server is down and customers are unable to access the*

website."

Priority:

Explanation: In Zero-shot prompting, no examples are provided. The model uses general language understanding to determine urgency and intent.

3. One-Shot Prompting for Email Priority Classification

Prompt:

Classify the priority of the following email as **High Priority,**

Medium Priority, or Low Priority.

Example:

Email: "Urgent: Security breach detected in user accounts."

Priority: High Priority

Email: "Please find the attached report for last month's sales."

Priority:

Explanation:

One-shot prompting provides a single labeled example to help the

model understand how urgency maps to priority levels.

4. Few-Shot Prompting for Email Priority Classification

Prompt:

Classify the priority of the following email as **High Priority,**

Medium Priority, or Low Priority.

Example 1:

Email: “Urgent: Website is down affecting all customers.”

Priority: High Priority

Example 2:

Email: “Please review the attached project document.”

Priority: Medium PriorityExample 3:

Email: “Reminder: Office will be closed on Friday.”

Priority: Low Priority

Example 4:

Email: “Payment gateway error detected.”

Priority: High Priority

Email: “Meeting scheduled for tomorrow has been postponed.”

Priority:

Explanation:

Few-shot prompting provides multiple examples, allowing the model

to better distinguish between urgency levels.

5. Evaluation of Prompting Techniques

Prompt

Type

Reliability Reason

Zero-shot Moderate

Works well for obvious urgent emails but may

confuse medium and low priority

One-shot High

One example improves understanding of

urgency

Few-shot Very High

Multiple examples reduce ambiguity and

improve consistency

Discussion:

Few-shot prompting produces the most reliable results because it exposes the model to multiple real-world scenarios. This helps in accurately distinguishing between high, medium, and low urgency emails, especially when the intent is not explicit.**Conclusion**

This assignment demonstrates how prompt engineering can be applied to email priority classification. Among the three approaches, **Few shot prompting is the most effective and reliable**, making it suitable for automated email triage systems in organizations.

Task-03:

1. Sample Student Queries with Department Mapping

Student Query

Department

“What is the eligibility criteria for B.Tech admissions?” Admissions

“When will the semester exam results be released?”

Exams

“Can I change my elective subject this semester?”

Academics

“What companies are visiting campus for placements?” Placements

“How can I apply for hostel admission?”

Admissions

“What is the exam fee payment deadline?”

Exams

2. Zero-Shot Intent Classification

Prompt:

Classify the following student query into one of these departments:

Admissions, Exams, Academics, or Placements.

Query: *"When will the semester exam results be released?"*

Department:

Explanation: In Zero-shot prompting, no examples are given. The language model uses its general understanding of the query to predict the correct department.

3. One-Shot Prompting for Improved Classification

Prompt:

Classify the following student query into one of these departments:

Admissions, Exams, Academics, or Placements.

Example:

Query: "What companies are visiting campus for placements?"

Department: Placements

Query: "Can I change my elective subject this semester?"

Department: Academics

Explanation:

One-shot prompting provides a single labeled example, helping the model understand how queries relate to departments.

4. Few-Shot Prompting for Refined Classification

Prompt:

Classify the following student query into one of these departments:

Admissions, Exams, Academics, or Placements.

Example 1:

Query: "What is the eligibility criteria for B.Tech admissions?"

Department: Admissions

Example 2:

Query: "When will the semester exam results be released?"

Department: ExamsExample 3:

Query: "Can I change my elective subject this semester?"

Department: Academics

Example 4:

Query: “What companies are visiting campus for placements?”

Department: Placements

Query: “What is the exam fee payment deadline?”

Department: Exams

Explanation:

Few-shot prompting provides multiple contextual examples, enabling the model to learn patterns more accurately and reduce ambiguity.

5. Analysis: Effect of Contextual Examples on Accuracy

Prompting Technique	**Accuracy Level**	**Reason**
Zero-shot	Moderate	Correct for simple queries but may misclassify overlapping intents
One-shot	High	One example improves intent understanding
Few-shot	Very High	Multiple examples provide clear context and reduce confusion

Discussion:

Contextual examples significantly improve classification accuracy. Few-shot prompting performs best because it exposes the model to multiple intent patterns, making it more reliable for real-world chatbot applications where queries can be diverse and ambiguous.**Conclusion**

This assignment demonstrates how prompt engineering techniques

can be used to route student queries in a university chatbot. Among the three approaches, **Few-shot prompting provides the highest accuracy and consistency**, making it the most suitable technique for automated student support systems.

Task-04:

1. Sample Chatbot Queries with Question Types

User Query

Question Type

“What are your customer support working hours?” Informational

“I want to reset my account password.”

Transactional

“My order has not arrived even after 10 days.”

Complaint

“The app interface is very user-friendly.”

Feedback

“How can I track my order?”

Informational

“I was charged twice for the same transaction.”

Complaint

2. Prompt Design for Zero-shot, One-shot, and Few-shot Learning

a) Zero-Shot Prompt

Prompt:

Classify the following user query into one of the categories:

Informational, Transactional, Complaint, or Feedback.

Query: *“I want to reset my account password.”*

Question Type:**Explanation:**

No examples are provided. The model uses its general language understanding to classify the query.

b) One-Shot Prompt

Prompt:

Classify the following user query into one of the categories:

Informational, Transactional, Complaint, or Feedback.

Example:

Query: “What are your customer support working hours?”

Question Type: Informational

Query: “I was charged twice for the same transaction.”

Question Type:Transactional

Explanation:

One labeled example helps the model understand how queries map to categories.

c) Few-Shot Prompt

Prompt:

Classify the following user query into one of the categories:

Informational, Transactional, Complaint, or Feedback.

Example 1:

Query: “How can I track my order?”

Question Type: Informational

Example 2:

Query: “I want to cancel my subscription.”

Question Type: TransactionalExample 3:

Query: “My order has not arrived even after 10 days.”

Question Type: Complaint

Example 4:

Query: “The app interface is very user-friendly.”

Question Type: Feedback

Query: “I want to reset my account password.”

Question Type: Informational

Explanation:

Multiple examples provide stronger context, helping the model distinguish between similar query types.

3. Testing Prompts on the Same Unseen Query

Unseen Query:

“I was charged twice for the same transaction.”

Prompt Type Predicted Question Type

Zero-shot

Complaint

One-shot

Complaint

Few-shot

Complaint

4. Comparison of Correctness and Ambiguity Handling

Prompting

Technique

Correctness Ambiguity Handling

Zero-shot

Moderate

May confuse transactional and

complaint queries**Prompting**

Technique

Correctness Ambiguity Handling

One-shot

High

Better differentiation with one

example

Few-shot

Very High Handles ambiguous cases accurately

5. Observations

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Zero-shot prompting works well for clear and simple queries but

struggles with overlapping intents.

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One-shot prompting improves classification by providing a

reference example.

- Few-shot prompting offers the highest accuracy by exposing the model to multiple query patterns.
- Ambiguous queries (e.g., payment issues) are best handled using Few-shot learning.

Conclusion

This assignment demonstrates that **Few-shot prompting is the most effective technique** for chatbot question type detection. By providing multiple contextual examples, the model achieves higher accuracy and better ambiguity resolution, making it ideal for real-world chatbot systems.**Task-05:**

1. Labeled Emotion Samples

Text Sample	**Emotion Label**
“I finally achieved my goals today, feeling great!”	Happy
“I feel lonely and empty most of the time.”	Sad
“I am extremely frustrated with how things turned out.”	Angry
“I keep worrying about my future and can’t relax.”	Anxious
“Today was just like any other normal day.”	Neutral
“I’m nervous and stressed about my upcoming exam.”	Anxious

2. Zero-Shot Prompting for Emotion Detection

Prompt:

Identify the emotion expressed in the following text.

Possible emotions: **Happy, Sad, Angry, Anxious, Neutral**.

Text: *"I feel lonely and empty most of the time."*

Emotion:

Explanation:

Zero-shot prompting does not provide any examples. The model relies entirely on its general understanding of emotional language.

3. One-Shot Prompting with an ExamplePrompt:

Identify the emotion expressed in the following text.

Possible emotions: **Happy, Sad, Angry, Anxious, Neutral**.

Example:

Text: "I finally achieved my goals today, feeling great!"

Emotion: Happy

Text: "I am extremely frustrated with how things turned out."

Emotion: Angry

Explanation:

One-shot prompting provides a single labeled example, guiding the model toward the correct emotional interpretation.

4. Few-Shot Prompting with Multiple Emotions

Prompt:

Identify the emotion expressed in the following text.

Possible emotions: **Happy, Sad, Angry, Anxious, Neutral**.

Example 1:

Text: "I finally achieved my goals today, feeling great!"

Emotion: Happy

Example 2:

Text: "I feel lonely and empty most of the time."

Emotion: Sad

Example 3:

Text: "I am extremely frustrated with how things turned out."

Emotion: Angry

Example 4:

Text: “I keep worrying about my future and can’t relax.”

Emotion: AnxiousExample 5:

Text: “Today was just like any other normal day.”

Emotion: Neutral

Text: “I’m nervous and stressed about my upcoming exam.”

Emotion: Anxious

Explanation:

Few-shot prompting provides multiple contextual examples, allowing the model to distinguish between closely related emotions more accurately.

5. Discussion: Ambiguity Handling Across Techniques

Prompting Technique

Accuracy Level

Ambiguity Handling

Zero-shot

Moderate

May confuse similar emotions like Sad and Anxious

One-shot

High

Improved clarity with a reference example

Few-shot

Very High

Best handling of emotional overlap and subtle cues

Discussion:

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Zero-shot prompting works for strong emotional cues but struggles with subtle or mixed emotions.

- One-shot prompting improves classification by providing a guiding example.
- Few-shot prompting performs best because multiple examples reduce confusion between similar emotions such as **Sad vs Anxious** or **Angry vs Frustrated**.**Conclusion**

This assignment demonstrates the application of prompt engineering techniques for emotion detection in mental-health chatbots. Among the three approaches, **Few-shot prompting provides the highest accuracy and best ambiguity resolution**, making it the most suitable technique for sensitive applications such as mental-health support systems.