Assignment 4.1

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Batch: 44

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

Task 1:

a. billing@company.com – Billing category
b. support@company.com – Support category
c. feedback@compay.com – Feedback category
d. info@company.com – Others category
e. no-reply@company.com – Others Category

Task 2:

Prompt:

Classify the following customer email into one of these categories:

Billing, Technical Support, Feedback, Others.

Email: "I was charged twice for my monthly subscription"

Task 3:

Prompt:

Email: "The app is not working properly"

Category: Technical Support

Now classify the following email:

Email: "My payment failed but the amount was deducted"

Task 4:

Prompt 1:

Email: "Payment failed during checkout"

Category: Billing

Prompt 2:

Email: "App crashes on startup"

Category: Technical Support

Prompt 3:

Email: "Excellent customer service"

Category: Feedback

Now classify the following email:

Email: "I was charged twice for my monthly subscription"

Task 5:

Code:

```
Lab-4.1.py > ...
def classify_email(email):
    email = email.lower()
    if "bill" in email or "charged" in email or "payment" in email:
        return "Billing"
    elif "error" in email or "crash" in email or "not working" in email:
        return "Technical Support"
    elif "thank" in email or "great" in email:
        return "Feedback"
    else:
        return "Others"

email = "I was charged twice for my monthly subscription"
print(classify_email(email))
```

Output:

```
Billing
```

Brief Comments

- **Zero-shot prompting** works without examples but may misclassify emails when the content is ambiguous.
- **One-shot prompting** improves understanding by providing one example, leading to better classification.
- **Few-shot prompting** gives the best results because multiple examples clearly define category boundaries, resulting in higher accuracy and confidence.

Observation

Few-shot prompting is the **most effective technique** for customer email classification, followed by one-shot, while zero-shot is the least reliable.

Problem Statement 2: Intent Classification for Chatbot Queries

Task 1:

Query ID	User Query	Intent
Q1	I am unable to log in to my account	Account Issue
Q2	Where is my order right now?	Order Status
Q3	What features does this product offer?	Product Inquiry
Q4	What are your customer support hours?	General Question
Q5	I forgot my account password	Account Issue
Q6	How much does this product cost?	Product Inquiry

Task 2:

Prompt:

Classify the following user query into one of these intents:

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

Query: "Where is my order right now?"

Task 3:

Prompt:

Query: "I am unable to log in to my account"

Intent: Account Issue

Now classify the following query:

Query: "Where is my order right now?"

Task 4:

Prompt 1:

Query: "I forgot my password"

Intent: Account Issue

Prompt 2:

Query: "Track my shipment"

Intent: Order Status

Prompt 3:

Query: "What are your working hours?"

Intent: General Question

Now classify the following query:

Query: "Where is my order right now?"

Task 5:

Prompting Technique	Accuracy	Reliability	Observation
Zero-shot	Medium	Low	Works for clear queries but struggles with ambiguity
One-shot	High	Medium	Better intent understanding with one example
Few-shot	Very High	High	Most accurate and consistent results

Observation

Few-shot prompting is the **most effective technique** for chatbot intent classification as it provides sufficient context and reduces ambiguity, followed by one-shot prompting. Zero-shot prompting is the least reliable.

Problem Statement 3: Student Feedback Analysis

Task A:

Prompt:

A zero-shot prompt classifies sentiment without giving any examples.

Prompt:

“Classify the sentiment of the following student feedback as Positive, Negative, or Neutral.

Feedback: The lectures were informative but sometimes rushed.”

Task B:

One-shot Prompt

A one-shot prompt provides one example before classification.

Prompt:

“Classify the sentiment of the student feedback as Positive, Negative, or Neutral.

Example:

Feedback: The professor explains concepts very clearly.

Sentiment: Positive

Now classify this feedback:

The lectures were informative but sometimes rushed.”

Task C:

Few-shot Prompt

A few-shot prompt provides multiple labeled examples.

Prompt:

“Classify the sentiment of student feedback as Positive, Negative, or Neutral.

Examples:

Feedback: The course content was very engaging and helpful.

Sentiment: Positive

Feedback: The assignments were confusing and poorly explained.

Sentiment: Negative

Feedback: The syllabus covered all required topics.

Sentiment: Neutral

Now classify this feedback:

The lectures were informative but sometimes rushed.”

Task D:

How examples improve sentiment classification accuracy

Examples help the model understand the meaning of each sentiment category.

They reduce confusion in mixed or unclear feedback.

They provide context and tone for correct classification.

They improve consistency in predictions.

Problem Statement 4: Course Recommendation System

Task A:

Zero-shot Prompt:

A zero-shot prompt classifies the learner's query without providing any examples.

Prompt:

"Classify the following learner query as Beginner, Intermediate, or Advanced.

Query: I want to learn machine learning from scratch."

Task B:

One-shot Prompt

A one-shot prompt provides one labeled example before classification.

Prompt:

"Classify the learner query as Beginner, Intermediate, or Advanced.

Example:

Query: I have no programming experience and want to learn Python.

Level: Beginner

Now classify this query:

I want to learn machine learning from scratch."

Task C:

Few-shot Prompt

A few-shot prompt provides multiple labeled examples to guide classification.

Prompt:

“Classify the learner query as Beginner, Intermediate, or Advanced.

Examples:

Query: I am new to programming and want to understand basic coding concepts.

Query: I know Python and want to build machine learning models.

Level: Intermediate

Query: I want to optimize deep learning models for real-world applications.

Level: Advanced

Now classify this query:

I want to learn machine learning from scratch.”

Task D:

How Few-shot prompting improves recommendation quality?

- Few-shot examples clearly define each learning level.
- They reduce ambiguity in learner queries.
- The model better understands skill differences between levels.
- Recommendations become more accurate and relevant.
- Consistent classification leads to better course suggestions.

Problem Statement 5: Social Media Post Moderation

Task A:

Zero-shot Prompt

A zero-shot prompt classifies a post without providing any examples.

Prompt:

“Classify the following social media post as Acceptable, Offensive, or Spam.

Post: Buy this product now! Limited offer!!!”

Task B:

One-shot Prompt

A one-shot prompt provides one labeled example before classification.

Prompt:

“Classify the social media post as Acceptable, Offensive, or Spam.

Example:

Post: This app is really helpful and easy to use.

Category: Acceptable

Now classify this post:

Buy this product now! Limited offer!!!”

Task C:

Few-shot Prompt

A few-shot prompt provides multiple labeled examples to guide classification.

Prompt:

“Classify the social media post as Acceptable, Offensive, or Spam.

Examples:

Post: Great content, very informative!

Category: Acceptable

Post: You are stupid and useless.

Category: Offensive

Post: Click here to win a free phone now!

Category: Spam

Now classify this post:

Buy this product now! Limited offer!!!”

Task D:

Challenges of Zero-shot prompting in content moderation

- The model may misunderstand the context of the post.
- It can struggle with sarcasm or indirect offensive language.
- There is higher risk of misclassification without examples.
- Spam and offensive content may look similar in some cases.
- Overall accuracy is lower compared to one-shot or few-shot prompting.