

Assignment 4.1

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Batch:27

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Problem Statement1: **Customer Email Classification**

Task1: Prepare five short sample emails, each belonging to one of the above categories.

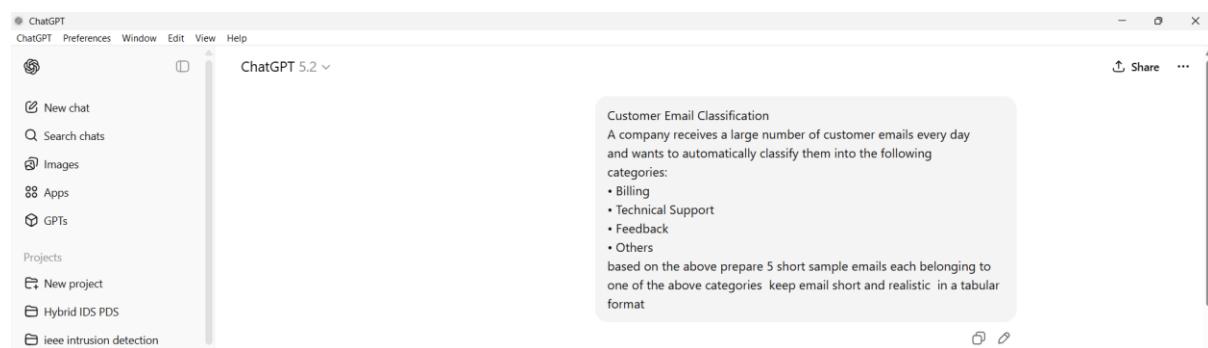
Prompt:

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

based on the above prepare 5 short sample emails each belonging to one of the above categories keep email short and realistic in a tabular format



Output:

Category	Email Text
Billing	Hi, I was charged twice for my subscription this month.
Technical Support	The app crashes whenever I try to log in
Feedback	I really like the new app update. It works smoothly
Others	Do you offer any student discounts?
Billing	Please share a copy of my last payment receipt.

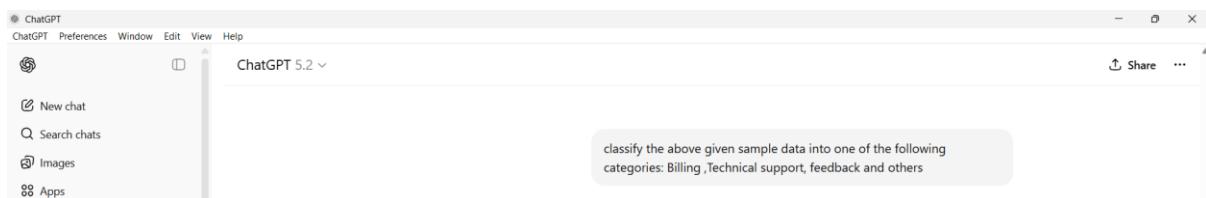
Explanation:

- The prompt describes a problem where a company wants to automatically classify customer emails into predefined categories.
- Four categories are defined: Billing, Technical Support, Feedback, and Others.
- The output presents these emails in a table with two columns: Category and Email Text.
- Sample emails are created to represent how real customer messages look for each category.

Task 2: Write a zero-shot prompt to classify a given email into one of the categories without providing any examples.

Prompt:

classify the above given sample data into one of the following categories: Billing ,Technical support, feedback and others



Output:

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Here is the classification of the previously given 5 sample emails, mapped clearly to the required categories:

Email Text	Category
Hi, I was charged twice for my subscription this month.	Billing
The app crashes whenever I try to log in.	Technical Support
I really like the new app update. It works smoothly.	Feedback
Do you offer any student discounts?	Others
Please share a copy of my last payment receipt.	Billing

This shows how each email is assigned to the most appropriate category based on its content.



Explanation:

- Each email is read and its main intent is identified.
 - Emails related to payments, charges, or receipts are classified as Billing.
 - Emails reporting app issues or errors are classified as Technical Support.
 - Emails expressing opinions or appreciation about the service are classified as Feedback.
 - Emails that do not fit the above categories, such as general questions, are classified as Others.

Task 3: Write a one-shot prompt by including one labeled email

example and ask the model to classify a new email.

Prompt:

Example:

Email Text: "Hi, I was charged twice for my subscription this month."

Category: Billing

Now classify this email into billing, technical support, feedback or others

Email Text: "Please share a copy of my last payment receipt."

Answer (Category only):

The screenshot shows the ChatGPT application window. At the top, it says "ChatGPT 5.2". Below the main area, there is a light gray box containing classification examples and a question. The examples show an email about being charged twice and its category as "Billing". The question asks to classify an email about a payment receipt into "billing, technical support, feedback or others".

Example:
Email Text: "Hi, I was charged twice for my subscription this month."
Category: Billing

Now classify this email into billing, technical support, feedback or others
Email Text: "Please share a copy of my last payment receipt."

Answer (Category only):

Output:

The screenshot shows the ChatGPT application window. At the top, it says "ChatGPT 5.2". Below the main area, there is a light gray box containing classification examples and a question, identical to the one in the previous screenshot. At the bottom of the screen, the word "Billing" is highlighted in blue, indicating it is the selected category for the classified email.

Example:
Email Text: "Hi, I was charged twice for my subscription this month."
Category: Billing

Now classify this email into billing, technical support, feedback or others
Email Text: "Please share a copy of my last payment receipt."

Answer (Category only):

Billing

Explanation:

- The prompt provides one example (charged twice → Billing), which makes this one-shot prompting.
- The model uses this single example as a reference to understand how classification should be done.
- The new email mentions a payment receipt, which is related to billing activities.
- It does not describe a technical issue or give feedback about the service.
- Based on the example and intent, the email is correctly classified as Billing.

Task 4:

Write a few-shot prompt by including two or three labeled email examples and ask the model to classify a new email.

Prompt:

Example 1

Email Text: "Hi, I was charged twice for my subscription this month."

Category: Billing

Example 2

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

Category: Technical Support

Example 3

Email Text: "I really like the new app update. It works smoothly."

Category: Feedback

Now classify this email

Email Text: "Do you offer any student discounts?"

Answer (Category only):

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Example 1
Email Text: "Hi, I was charged twice for my subscription this month."
Category: Billing

Example 2
Email Text: "The app crashes whenever I try to log in."
Category: Technical Support

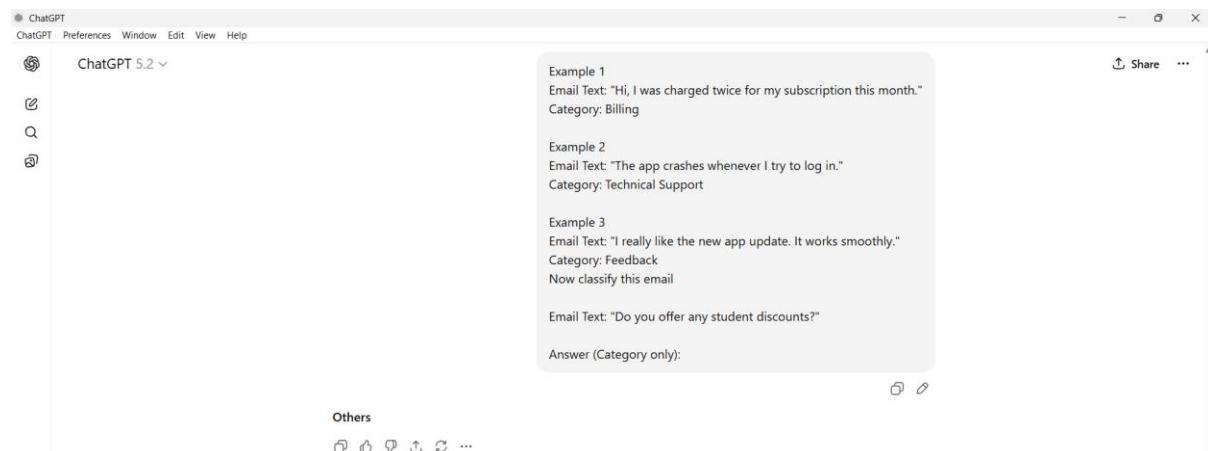
Example 3
Email Text: "I really like the new app update. It works smoothly."
Category: Feedback
Now classify this email

Email Text: "Do you offer any student discounts?"

Answer (Category only):

⋮

Output:



Explanation:

- The prompt provides multiple examples, so this is few-shot prompting.
- The email asks about student discounts, which is a general inquiry.
- It is not related to billing issues like charges or payments.
- It does not describe any technical problem or app issue.
- It does not give feedback or opinions about the service, so it is classified as Others.

Task 5:

Compare the outputs obtained using zero-shot, one-shot, and few-shot prompting techniques and briefly comment on their effectiveness

Output:

Prompting Technique	Input Given to Model	Output Category	Effectiveness
Zero-shot prompting	Only the category list (Billing, Technical Support, Feedback, Others) and the email text	Correct (Billing / Others, based on intent)	Works well for simple and clear emails, but accuracy depends entirely on the model's general understanding
One-shot prompting	One example email with its category, followed by a new email	Correct (Billing)	More reliable than zero-shot, as the example guides the classification pattern.
Few-shot prompting	Multiple labeled examples covering different categories	Correct (Others)	Most effective, as multiple examples clearly define category boundaries and reduce ambiguity

Problem Statement 2

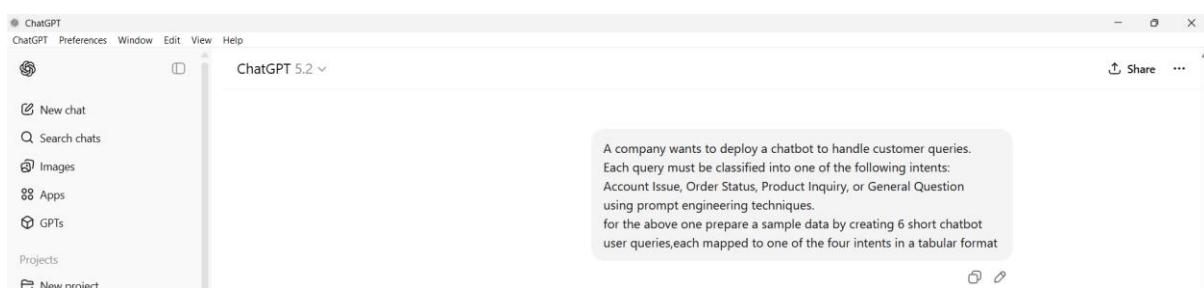
Intent Classification for Chatbot Queries

TASK 1: Prepare Sample Data

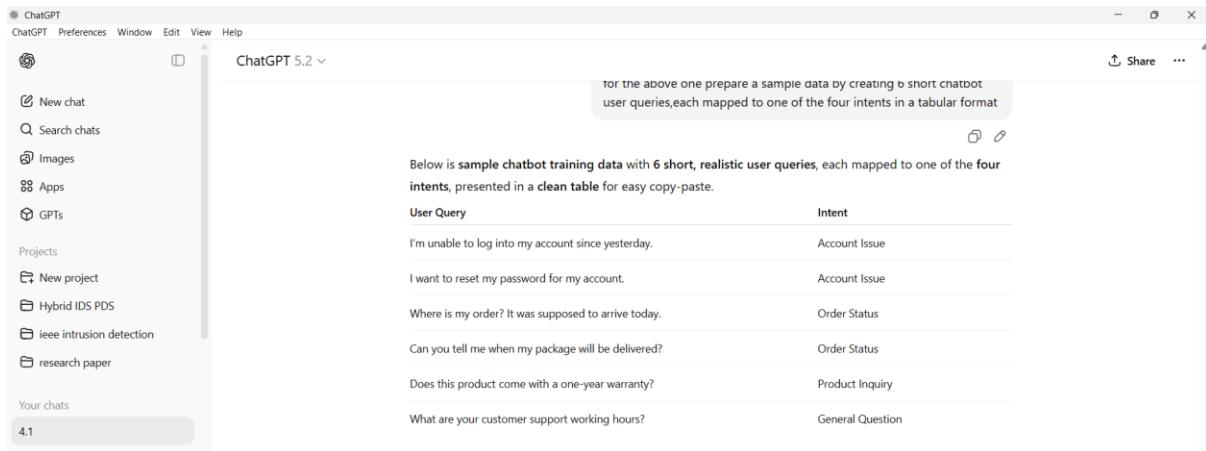
Create 6 short chatbot user queries, each mapped to one of the four intents.

Prompt:

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. for the above one prepare a sample data by creating 6 short chatbot user queries, each mapped to one of the four intents in a tabular format



Output:



Task 2:

Zero-shot Prompting

Design a prompt that asks the LLM to classify a user query into the given intent categories without examples.

Prompt:

Classify the following user query into one of these categories: Account Issue, Order Status, Product Inquiry, General Question.

User Query: Can you help me change the email address linked to my account?

Classify the following user query into one of these categories:
Account Issue, Order Status, Product Inquiry, General Question.
User Query: Can you help me change the email address linked to my account?

Output:

Classify the following user query into one of these categories:
Account Issue, Order Status, Product Inquiry, General Question.
User Query: Can you help me change the email address linked to my account?

Account Issue
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Explanation:

- The model classifies the query without any examples, which makes this a zero-shot prompting task.
- The query asks about changing the email address linked to an account, which is an account-related action.
- It does not involve tracking or delivery of an order.
- It is not asking about product features or details.
- Therefore, based on intent understanding alone, the query is correctly classified as Account Issue.

Task 3:

One-shot Prompting

Provide one labeled query in the prompt before classifying a new query

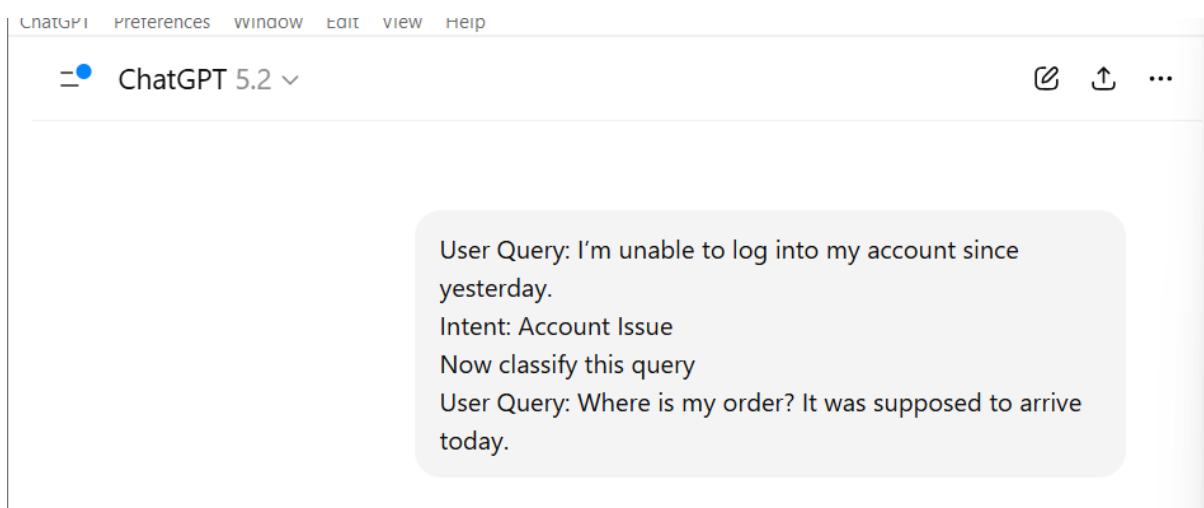
Prompt:

User Query: I'm unable to log into my account since yesterday.

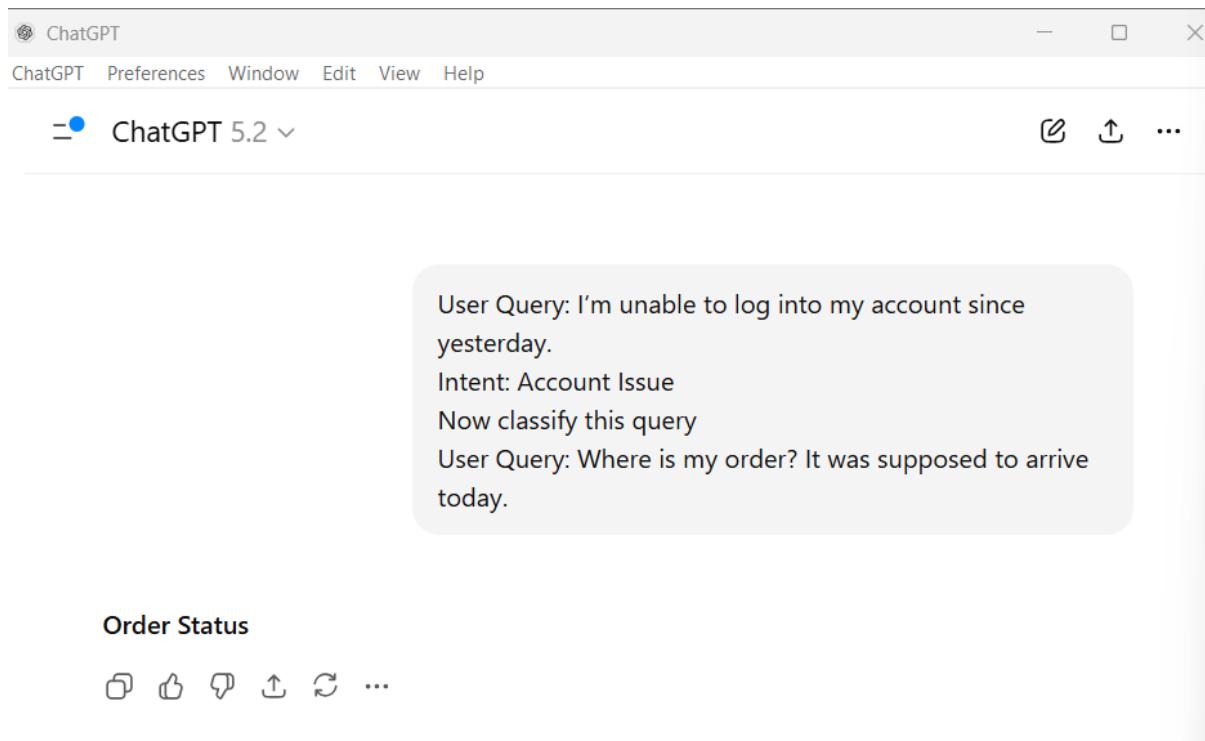
Intent: Account Issue

Now classify this query

User Query: Where is my order? It was supposed to arrive today.



Output:



Explanation:

- The prompt includes one labeled example, so this is one-shot prompting.
- The example shows that issues related to user accounts are classified as Account Issue.
- The new query asks about the location and delivery time of an order.
- It does not mention login, account settings, or personal information.
- Based on the intent of tracking an order, the query is correctly classified as Order Status.

Task 4:

Few-shot Prompting

Include 3–5 labeled intent examples to guide the LLM before classifying a new query.

Prompt:

Example 1

User Query: "I'm unable to log into my account since yesterday."

Intent: Account Issue

Example 2

User Query: "I want to reset my password for my account."

Intent: Account Issue

Example 3

User Query: "Where is my order? It was supposed to arrive today."

Intent: Order Status

Example 4

User Query: "Does this product come with a one-year warranty?"

Intent: Product Inquiry

Now classify this query

User Query: "What are your customer support working hours?"

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Example 1

User Query: "I'm unable to log into my account since yesterday."

Intent: Account Issue

Example 2

User Query: "I want to reset my password for my account."

Intent: Account Issue

Example 3

User Query: "Where is my order? It was supposed to arrive today."

Intent: Order Status

Example 4

User Query: "Does this product come with a one-year warranty?"

Intent: Product Inquiry

Now classify this query

User Query: "What are your customer support working hours?"



Output:

Example 1
User Query: "I'm unable to log into my account since yesterday."
Intent: Account Issue

Example 2
User Query: "I want to reset my password for my account."
Intent: Account Issue

Example 3
User Query: "Where is my order? It was supposed to arrive today."
Intent: Order Status

Example 4
User Query: "Does this product come with a one-year warranty?"
Intent: Product Inquiry
Now classify this query
User Query: "What are your customer support working hours?"



General Question

Copy

**Explanation:**

The prompt provides multiple labeled examples, which makes this a few-shot prompting task.

- The examples show clear patterns for Account Issue, Order Status, and Product Inquiry.
- The new query asks about customer support working hours, which is general information.
- It does not relate to account problems, orders, or product details.
- Based on the learned pattern from examples, the query is correctly classified as General Question.

Task 5: Evaluation

Apply all three techniques to the same set of test queries and document differences in performance.

Prompting Technique	Examples Provided in Prompt	Output Accuracy	Observed Performance	Overall Effectiveness
Zero-shot	No examples, only intent categories	Correct for all queries	Relies purely on language understanding; works well for clear and simple queries	Good, but may struggle with ambiguous queries
One-shot	One labeled example	Correct for all queries	Single example helps guide	Better than zeroshot

			intent mapping and improves reliability	
Few-shot	Multiple labeled examples across intents	Correct for all queries	Clear patterns reduce ambiguity and improve consistency	Best and most reliable

Problem statement 3 Student Feedback Analysis

A university collects student feedback and wants to categorize comments as Positive, Negative, or Neutral. give sample data for this

Here is sample student feedback data categorized into Positive, Negative, and Neutral, presented in a clean tabular format for easy copy-paste into Word.

Student Feedback Comment	Category	Copy
The professors explain concepts clearly and are very supportive.	Positive	
The campus facilities are well maintained and clean.	Positive	
The course workload is too heavy and stressful.	Negative	
The online portal often crashes during exams.	Negative	
The semester started on time this year.	Neutral	
Classes are held from Monday to Friday.	Neutral	

Task 1:

Write a Zero-shot prompt to classify feedback sentiment

Prompt:

Classify the above student feedback into one of these categories: Positive, Negative, Neutral.

Classify the above student feedback into one of these categories:
Positive, Negative, Neutral.



Output:

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Here is the classification of the previously given student feedback comments:

Student Feedback Comment	Category
The professors explain concepts clearly and are very supportive.	Positive
The campus facilities are well maintained and clean.	Positive
The course workload is too heavy and stressful.	Negative
The online portal often crashes during exams.	Negative
The semester started on time this year.	Neutral
Classes are held from Monday to Friday.	Neutral

Explanation:

- The prompt asks for classification without providing any labeled examples, which makes this a zero-shot prompting task.
- Each feedback comment is analyzed based on its sentiment and tone.
- Comments expressing satisfaction or appreciation are classified as Positive.
- Comments expressing problems or dissatisfaction are classified as Negative.
- Statements that are factual and do not express an opinion are classified as Neutral.

Task 2:

Provide a One-shot prompt with one feedback example.

Prompt:

Classify the following student feedback into one of these categories: Positive, Negative, Neutral. Return only the sentiment label.

Example:

Student Feedback: "The professors explain concepts clearly and are very supportive."

Sentiment: Positive

Now classify this feedback:

Student Feedback: "The course workload is too heavy and stressful."

Classify the following student feedback into one of these categories:

Positive, Negative, Neutral. Return only the sentiment label.

Example:

Student Feedback: "The professors explain concepts clearly and are very supportive."

Sentiment: Positive

Now classify this feedback:

Student Feedback: "The course workload is too heavy and stressful."



Output:

Classify the following student feedback into one of these categories:

Positive, Negative, Neutral. Return only the sentiment label.

Example:

Student Feedback: "The professors explain concepts clearly and are very supportive."

Sentiment: Positive

Now classify this feedback:

Student Feedback: "The course workload is too heavy and stressful."



Negative



- **Explanation:**
The prompt includes one labeled example, which makes this a one-shot prompting task.
- The example shows that positive language and appreciation are classified as Positive sentiment.
- The new feedback contains negative words like “too heavy” and “stressful.”
- These words indicate dissatisfaction with the course workload.
- Based on the example and sentiment understanding, the feedback is correctly classified as Negative.

Task 3:

Create a Few-shot prompt using multiple labeled feedback samples.

Prompt:

Examples:

Student Feedback: "The professors explain concepts clearly and are very supportive."

Sentiment: Positive

Student Feedback: "The campus facilities are well maintained and clean."

Sentiment: Positive

Student Feedback: "The course workload is too heavy and stressful."

Sentiment: Negative

Student Feedback: "The semester started on time this year."

Sentiment: Neutral

Now classify this feedback:

Student Feedback: "The online portal often crashes during exams."

Examples:

Student Feedback: "The professors explain concepts clearly and are very supportive."

Sentiment: Positive

Student Feedback: "The campus facilities are well maintained and clean."

Sentiment: Positive

Student Feedback: "The course workload is too heavy and stressful."

Sentiment: Negative

Student Feedback: "The semester started on time this year."

Sentiment: Neutral

Now classify this feedback:

Student Feedback: "The online portal often crashes during exams."



Output:

Examples:

Student Feedback: "The professors explain concepts clearly and are very supportive."
Sentiment: Positive

Student Feedback: "The campus facilities are well maintained and clean."
Sentiment: Positive

Student Feedback: "The course workload is too heavy and stressful."
Sentiment: Negative

Student Feedback: "The semester started on time this year."
Sentiment: Neutral

Now classify this feedback:

Student Feedback: "The online portal often crashes during exams."

Negative



- **Explanation:**

- The prompt provides multiple labeled examples, so this is a few-shot prompting task.
- The examples show clear patterns for Positive, Negative, and Neutral sentiments.
- The new feedback mentions a problem ("online portal often crashes").
- This indicates dissatisfaction and inconvenience for students.
- Based on the patterns learned from the examples, the feedback is correctly classified as Negative.

Task 4:

Explain how examples improve sentiment classification accuracy.

- Examples help the model understand **what kind of language belongs to each sentiment category**.
- They provide **context and patterns**, such as words associated with positive, negative, or neutral opinions.
- With examples, the model makes **more consistent and accurate decisions**, especially for similar inputs.
- Examples reduce ambiguity by showing how borderline cases should be classified.
- As more relevant examples are given, the model's **confidence and reliability** in classification improve.

Problem Statement 4

Course Recommendation System

Task 1:

Prompt:

classify the learner queries for the above data

Output:

Learner Query	Level
I am new to programming. Which Python course should I start with?	Beginner
Can you recommend a basic course on machine learning?	Beginner
I know Python basics. Which data science course should I take next?	Intermediate
I have some experience with neural networks. What should I learn next?	Intermediate
I want an advanced course on deep learning and model optimization.	Advanced
Which course covers reinforcement learning in detail?	Advanced

Explanation:

- The classification is done without providing any example queries, which makes it a zero-shot prompting task.
- The model relies on its general understanding of learning levels and query intent.
- Queries asking for *basic* or *introductory* learning are identified as Beginner.
- Queries mentioning *prior knowledge* or *some experience* are identified as Intermediate.
- Queries requesting *in-depth* or *specialized topics* are classified as Advanced.

Task 2:

Create a One-shot prompt with one example query.

Prompt:

Classify the learner query into one of these levels: Beginner, Intermediate, Advanced. Return only the level name.

Example:

Learner Query: "I am new to programming. Which Python course should I start with?"

Level: Beginner

Now classify this query:

Learner Query: "I know Python basics. Which data science course should I take next?"

Classify the learner query into one of these levels: Beginner, Intermediate, Advanced. Return only the level name.

Example:

Learner Query: "I am new to programming. Which Python course should I start with?"

Level: Beginner

Now classify this query:

Learner Query: "I know Python basics. Which data science course should I take next?"



Output:

Classify the learner query into one of these levels: Beginner, Intermediate, Advanced. Return only the level name.

Example:

Learner Query: "I am new to programming. Which Python course should I start with?"

Level: Beginner

Now classify this query:

Learner Query: "I know Python basics. Which data science course should I take next?"

Intermediate



- **Explanation:**

The prompt provides one labeled example, which guides how the classification should be done.

- The example shows that queries mentioning being *new* are classified as Beginner.
- The new query states "I know Python basics", indicating prior knowledge.
- It asks what to learn next, which implies progression beyond beginner level.
- Based on the example and intent, the query is correctly classified as Intermediate.

Task 3:

Develop a Few-shot prompt with multiple labeled queries

Prompt:

Examples:

Learner Query: *"I am new to programming. Which Python course should I start with?"*

Level: Beginner

Learner Query: *"Can you recommend a basic course on machine learning?"*

Level: Beginner

Learner Query: *"I know Python basics. Which data science course should I take next?"*

Level: Intermediate

Learner Query: *"I have some experience with neural networks. What should I learn next?"*

Level: Intermediate

Learner Query: *"I want an advanced course on deep learning and model optimization."*

Level: Advanced

Now classify this query:

Learner Query: *"Which course covers reinforcement learning in detail?"*

ChatGPT 5.2 ▾

Examples:

Learner Query: "I am new to programming. Which Python course should I start with?"

Level: Beginner

Learner Query: "Can you recommend a basic course on machine learning?"

Level: Beginner

Learner Query: "I know Python basics. Which data science course should I take next?"

Level: Intermediate

Learner Query: "I have some experience with neural networks. What should I learn next?"

Level: Intermediate

Learner Query: "I want an advanced course on deep learning and model optimization."

Level: Advanced

Now classify this query:

Learner Query: "Which course covers reinforcement learning in detail?"



Output:

ChatGPT 5.2 ▾

Learner Query: "I have some experience with neural networks. What should I learn next?"
Level: Intermediate

Learner Query: "I want an advanced course on deep learning and model optimization."
Level: Advanced

Now classify this query:
Learner Query: "Which course covers reinforcement learning in detail?"

Advanced



Explanation:

- The prompt provides multiple labeled examples, so this is a few-shot prompting task.
- The examples clearly show what language corresponds to Beginner, Intermediate, and Advanced levels.
- The query asks for reinforcement learning, which is an advanced and specialized topic.
- It also mentions learning the topic in detail, indicating a high level of depth.
- Based on the patterns from the examples, the query is correctly classified as Advanced

Task 4:

d) Discuss how Few-shot prompting improves recommendation quality

Explanation:

- Few-shot prompting gives the model several examples to learn from.
- These examples show which type of query belongs to which level.
- The model makes fewer mistakes when classifying new queries.
- It gives more suitable course recommendations to learners.
- Overall, the recommendations become more accurate and reliable.

Problem Statement 5:

Social Media Post Moderation

Task 1:

Write a Zero-shot prompt for post moderation.

Prompt:

You are a content moderation system. Classify the social media post into one of these categories: Acceptable, Offensive, Spam.

You are a content moderation system.
Classify the social media post into one of these categories:
Acceptable, Offensive, Spam.



Output:

Social Media Post	Category
Had a great time at the event today with friends!	Acceptable
This app is stupid and everyone using it is dumb.	Offensive
Buy cheap followers now! Visit our site for instant growth.	Spam
Congratulations to the team on the big win!	Acceptable
You are useless and should not be allowed here.	Offensive
Earn money fast from home. Click the link now!	Spam

Explanation:

- The posts are classified without providing any labeled examples, so this is zero-shot prompting.
- Each post is analyzed only by its content and tone.
- Normal, friendly, or positive messages are classified as Acceptable.
- Posts with insulting or abusive language are classified as Offensive.
- Posts that promote links, offers, or repetitive advertisements are classified as Spam.

Task 2: Convert it into a One-shot prompt

Prompt:

Example:

Post: "Had a great time at the event today with friends!"

Category: Acceptable

Now classify this post:

Post: "Buy cheap followers now! Visit our site for instant growth."

Example:

Post: "Had a great time at the event today with friends!"

Category: Acceptable

Now classify this post:

Post: "Buy cheap followers now! Visit our site for instant growth."

Output:

Example:

Post: "Had a great time at the event today with friends!"

Category: Acceptable

Now classify this post:

Post: "Buy cheap followers now! Visit our site for instant growth."

Spam

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- **Explanation:**

- The prompt gives one example of how a post is classified, so this is one-shot prompting.
- The example shows that normal, friendly posts are Acceptable.
- The new post is promoting a service and asking users to visit a site.
- It looks like an advertisement meant to attract users quickly.
- Therefore, the post is correctly classified as Spam.

Task 3:

Design a Few-shot prompt using multiple examples.

Prompt:

Examples:

Post: "*Had a great time at the event today with friends!*"

Category: Acceptable

Post: "*This app is stupid and everyone using it is dumb.*"

Category: Offensive

Post: "*Buy cheap followers now! Visit our site for instant growth.*"

Category: Spam

Post: "*Congratulations to the team on the big win!*"

Category: Acceptable

Now classify this post:

Post: "*You are useless and should not be allowed here.*"

Examples:

Post: "Had a great time at the event today with friends!"

Category: Acceptable

Post: "This app is stupid and everyone using it is dumb."

Category: Offensive

Post: "Buy cheap followers now! Visit our site for instant growth."

Category: Spam

Post: "*Congratulations to the team on the big win!*"

Category: Acceptable

Now classify this post:

Post: "*You are useless and should not be allowed here.*"



Output:

The screenshot shows the ChatGPT 5.2 interface. At the top, there are 'View' and 'Help' menu options. Below that, it says 'ChatGPT 5.2'. On the right side, there are icons for file operations like upload, download, and refresh. The main area has a light gray background. A white box labeled 'Examples:' contains four entries:

- Post: "Had a great time at the event today with friends!"
Category: Acceptable
- Post: "This app is stupid and everyone using it is dumb."
Category: Offensive
- Post: "Buy cheap followers now! Visit our site for instant growth."
Category: Spam
- Post: "Congratulations to the team on the big win!"
Category: Acceptable

Below the examples, a message says 'Now classify this post:' followed by the text 'Post: "You are useless and should not be allowed here."'. Underneath this message, the word 'Offensive' is displayed in bold. At the bottom of the interface, there are several small icons: a square, a downward arrow, a left arrow, a right arrow, a double left arrow, a double right arrow, and three dots.

Explanation:

- The prompt includes multiple labeled examples, so this is few-shot prompting.
- The examples show that posts with insults or abusive language are classified as Offensive.
- The new post directly attacks a person using harsh and disrespectful words.
- It is not a normal message and not an advertisement.
- Based on the pattern from the examples, the post is correctly classified as Offensive.

Task 4:

Explain the challenges of Zero-shot prompting in content moderation.

Output:

- Zero-shot prompting works without examples, so the model may misunderstand unclear or borderline posts.
- Some posts can be ambiguous, making it hard to decide if they are offensive or acceptable.
- Slang, sarcasm, or local language can be misclassified without prior examples.
- The model may struggle with context, such as jokes or quoted text.
- This can lead to false positives or false negatives, affecting moderation quality.

