

Generative AI – Prompt Engineering

No code AI/ML - MIT

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Business Context, Problem Overview and Solution Approach

- In today's social media landscape, customer reviews contain valuable insights into a company's offerings. Analyzing this feedback helps understand customer reception and identify areas for enhancement to improve satisfaction.
- A critical aspect of social media reviews is the speed at which a company's representative addresses customer issues or responds to feedback, which is crucial for improving customer loyalty.
- To enhance customer satisfaction, we propose a Gen AI-based solution that analyzes incoming reviews and generates actionable data points. This solution will guide customer representatives on appropriate actions and provide drafts of customized responses.

Prompt and the structure of the Prompt

Various prompt techniques are used to retrieve most appropriate response from Gen AI models.

- **No shot prompt**

- Can you analyze the following data and provide insight?

- **One shot prompt**

- Can you analyze following data set which contains customer reviews? After analyzing reviews, add the following columns and select appropriate options as response.
 - Sentiment: Positive, Negative or Neutral
 - Tag: Food Quality, Ambiance, Price, Overall Experience
 - Priority: High, Normal or Low
 - Suggested Action: Suggest what should Agent do?

Prompt and the structure of the Prompt

- Few shot prompt with system message.

System Message:

You are in charge of analyzing customer reviews for our restaurants and generate automated response for each comment to help agent address customer's concerns if there are any, along with suggested actions and priority to attend to the customer based on the review. Provide output in Jason format as well as in tabular format.

Explanation of input file format:

Please go through the attached excel file which contains the following columns.

- Customer ID: Customer identification
- Review: Customer review in English language

Note : Review text is inside ""

Details of required output:

After analyzing the review, add the following columns and select appropriate options as response.

- Sentiment: Positive, Negative or Neutral
- Tag: Food Quality, Ambiance, Price, Overall Experience
- Priority: High, Normal or Low
- Suggested Action: Suggest what should Agent do?
- Automated Response : Provide appropriate automated response.

Note : Do not modify Customer_ID and Review contents

No Shot prompt and the results

No shot prompt : Can you analyze the following data and provide insight?

Results: Provided good overall insight as no other instructions was provided.
Here's an analysis of the provided customer reviews:

- Overall Sentiment:
 - Positive: 4 reviews (Cust2024-001, Cust2024-003, Cust2024-005, Cust2024-007)
 - Mixed: 1 review (Cust2024-002)
 - Negative: 4 reviews (Cust2024-004, Cust2024-009, Cust2024-010)
 - Neutral: 1 review (Cust2024-008)
 - Non-review: 1 entry (Cust2024-006)
- Customer Focus:
 - Food Quality: Most reviews mention food quality (both positive and negative). Well-prepared dishes like steak, scallops, and fresh seafood receive praise. Conversely, bland or overcooked food is a point of criticism.
 - Service: A few reviews highlight service issues (slowness, inattentiveness, rudeness).
 - Ambiance: Limited mentions, but one negative review mentions a noisy and crowded atmosphere.
 - Portion Size: One positive review mentions generous portions.
- Additional Notes:
 - It would be helpful to know the total number of reviews to understand the positivity/negativity ratio in context.
 - Consider analyzing word frequency to identify commonly mentioned positive and negative aspects in more detail.

One Shot prompt and the results

- Few shot prompt
 - Can you analyze following data set which contains customer reviews? After analyzing reviews, add the following columns and select appropriate options as response.
 - Sentiment, Tag, Priority, Suggested Action

Customer_ID	Review	Sentiment	Tag	Priority	Suggested Action
Cust2024-001	"The food at this restaurant is absolutely amazing! The flavors are rich and vibrant, and every dish is a culinary delight. The tender, melt-in-your-mouth steak is perfectly seasoned and accompanied by a velvety red wine reduction. The dessert selection is a work of art, with the creamy tiramisu stealing the show."	Positive	Food Quality	Low	Thank the customer for their positive feedback and encourage them to visit again.
Cust2024-002	"I had a mixed experience at this restaurant. While some dishes were enjoyable, others fell short of expectations. The appetizer of crispy calamari was perfectly cooked and flavorful, but the main course of chicken piccata lacked seasoning and was slightly overcooked."	Neutral	Food Quality	Normal	Apologize for the inconsistency in food quality and assure the customer of improvements.
Cust2024-003	"I had a fantastic experience dining at this restaurant. The food was exquisite, with each dish beautifully presented. The appetizer of fresh oysters was a taste of the ocean, while the main course of seared scallops over a bed of saffron-infused risotto was a symphony of flavors. The attention to detail in every aspect of the meal was truly commendable."	Positive	Overall Experience	Low	Thank the customer for their wonderful feedback and invite them to return soon.
Cust2024-004	"I had a negative experience at this restaurant. The food was below average, and the flavors were bland. The appetizer of bruschetta lacked seasoning, and the main course of pasta was overcooked and lacked flavor."	Negative	Food Quality	High	Apologize for the poor experience and offer a discount on their next visit.

Few Shot prompt and the results

Results Few shot prompt with system message:

As more details on input and required output is provided along with defining the role for Gen AI model, it provided perfect output which can be automated.

Customer ID	Review	Sentiment	Tag	Priority	Suggested Action	Suggested Response
Cust2024-001	"The food at this restaurant is absolutely amazing! The flavors are rich and vibrant, and every dish is a culinary delight. The tender, melt-in-your-mouth steak is perfectly seasoned and accompanied by a velvety red wine reduction. The dessert selection is a work of art, with the creamy tiramisu stealing the show."	Positive	Food Quality	Low	Thank the customer for their positive feedback and encourage them to visit again.	"Thank you so much for your wonderful review! We are thrilled to hear that you enjoyed your dining experience with us. We look forward to welcoming you back soon for another delightful meal."
Cust2024-002	"I had a mixed experience at this restaurant. While some dishes were enjoyable, others fell short of expectations. The appetizer of crispy calamari was perfectly cooked and flavorful, but the main course of chicken piccata lacked seasoning and was slightly overcooked."	Neutral	Food Quality	Normal	Apologize for the inconsistency in food quality and assure the customer of improvements.	"Thank you for your feedback. We apologize for the inconsistency in the quality of our dishes. Your comments have been shared with our kitchen team, and we will work on improving our seasoning and cooking methods. We hope to have the chance to serve you better next time."
Cust2024-003	"I had a fantastic experience dining at this restaurant. The food was exquisite, with each dish beautifully presented. The appetizer of fresh oysters was a taste of the ocean, while the main course of seared scallops over a bed of saffron-infused risotto was a symphony of flavors. The attention to detail in every aspect of the meal was truly commendable."	Positive	Overall Experience	Low	Thank the customer for their wonderful feedback and invite them to return soon.	"Thank you for your fantastic review! We are delighted to hear that you enjoyed your dining experience with us. Your kind words about our food and presentation mean a lot to us. We look forward to serving you again soon."
Cust2024-004	"I had a negative experience at this restaurant. The food was below average, and the flavors were bland. The appetizer of bruschetta lacked seasoning, and the main course of pasta was overcooked and lacked flavor."	Negative	Food Quality	High	Apologize for the poor experience and offer a discount on their next visit.	"We are very sorry to hear about your recent experience at our restaurant. Your feedback is important to us, and we apologize for the bland flavors and overcooked dishes. We would like to offer you a discount on your next visit to make up for this. Please give us another chance to provide you with a better dining experience."

Prompt and the results

Results Few shot prompt with system message:

In order to automat the process, output was requested in Json format and it provided perfectly usable output in Jason.

```
json Copy code

[
  {
    "Customer_ID": "Cust2024-001",
    "Review": "The food at this restaurant is absolutely amazing! The flavors are rich and",
    "Sentiment": "Positive",
    "Tag": "Food Quality",
    "Priority": "Low",
    "Suggested Action": "Acknowledge the positive feedback and thank the customer for thei",
  },
  {
    "Customer_ID": "Cust2024-002",
    "Review": "I had a mixed experience at this restaurant. While some dishes were enjoyab",
    "Sentiment": "Neutral",
    "Tag": "Food Quality",
    "Priority": "Normal",
    "Suggested Action": "Apologize for the inconsistency and assure the customer that thei",
  },
]
```

Exploring Different Prompting Techniques

In the experimentation depicted in previous slides, we explored following three different types of prompts.

- **No Shot prompt** : Where we do not provide much details about input and output and let Gen AI model analyze data and provide results.
- **One Shot prompt**: In One shot prompt, we provided minimum information about input and output and asked Gen AI model to provide required results.
- **Few shot prompt**: In Few shot prompt which is most comprehensive with all needed details is provided to Gen AI model.

Note: *You can use more than one slide if needed*

Observations/Insights and conclusions

- No shot prompt provided very good insight into the customer reviews but may not be usable for the purpose of guiding customer rep in responding to the clients.
- *One shot prompt provided much needed details and can be provided to customer rep to act upon.*
- *Few shot prompt with system message provided output which can be used to automate the process by using Jason formatted output to integrate into existing system.*

APPENDIX

Dataset overview

- Input data set was very simple as it only had following columns
 - **Customer ID:** Customer identification
 - **Review:** Customer review in English language

Customer_ID	Review
Cust2024-001	"The food at this restaurant is absolutely amazing! The flavors are rich and vibrant, and every dish is a culinary delight. The tender, melt-in-your-mouth steak is perfectly seasoned and accompanied by a velvety red wine reduction. The dessert selection is a work of art, with the creamy tiramisu stealing the show."
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Comparison between Gen AI models

Following Gen AI providers were used for this test.

Chat GPT, Gemini, Perplexity, Copilot

- Perplexity did not follow instructions properly and modified Customer ID and also made original reviews shorter. Due to this, it was hard to match results to the original records.
- Perplexity provided easier way to attach .txt file
- Gemini provided userfriendly way to export output to excel directly.
- Chat GPT and Copilot performed very well and provided desired results.



Happy Learning !

