Sentiment Analysis API Documentation

1. Introduction

This project implements a Sentiment Analysis API using Flask, which processes customer reviews from XLSX or CSV files. The API integrates with the Groq API to perform sentiment analysis and returns structured JSON results with positive, negative, and neutral sentiment scores.

2. Approach

The API is developed using the Flask web framework. It accepts customer reviews in either XLSX or CSV format. The reviews are extracted, and the Groq API is called to analyze the sentiment. The results are then returned in a structured JSON format.

3. Implementation

The API consists of the following key components:

- Flask Application: The core application that handles incoming requests.
- File Handling: Processes both XLSX and CSV files to extract reviews.
- Groq API Integration: Uses the Groq API for sentiment analysis.
- Error Handling: Basic error handling for invalid file formats and API errors.

The structured JSON response includes sentiment scores for each review in the format:

```
{
  'positive': score,
  'negative': score,
  'neutral': score
}
```

4. API Usage

To use the API, start the Flask server and send a POST request to the /analyze endpoint with a file containing customer reviews.

Example request using curl: curl -X POST -F 'file=@path/to/customer_reviews.xlsx' http://127.0.0.1:5000/analyze

The response will be a JSON object containing the sentiment scores:

```
[
    {'positive': score, 'negative': score, 'neutral': score},
    ...
]
```

5. Results Analysis

The API provides sentiment scores that can be used to understand customer opinions on products or services. The positive, negative, and neutral scores offer insights into customer sentiment trends.

However, the analysis may not accurately capture sarcasm or complex sentiments.

6. Limitations

The current implementation has some limitations:

- Sentiment analysis may struggle with sarcasm or nuanced language.
- The API only handles a limited set of error cases; more robust error handling could beimplemented.

7. Improvements

Future improvements could include:

- Supporting additional file formats (e.g., JSON).

- Enhancing sentiment categorization for more detailed analysis.
- Adding user authentication for API access.

8. Conclusion

The Sentiment Analysis API successfully integrates with the Groq API to provide insights into customer reviews. This project demonstrates the ability to handle input files and perform meaningful analysis using a Large Language Model.