

# Sentiment Analysis API with LLM Integration

## Introduction:

The Sentiment Analysis API is designed to process customer reviews and perform sentiment analysis using the Groq Large Language Model API. The API accepts CSV or XLSX files containing customer reviews and returns a structured JSON response with sentiment scores.

## API Design

### 1. File Upload Handling:

The API accepts files in CSV or XLSX format and processes the input to extract customer reviews. The file is validated to ensure it contains a 'review' column for analysis.

### 2. Groq API Integration:

The API sends the extracted reviews to the Groq LLM API for sentiment analysis. The response is processed to extract sentiment scores (positive, negative, and neutral).

## Structured Response

The structured response contains sentiment scores as a JSON object in the following format:

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

}

## Testing

The API can be tested using curl or Postman. An example curl command for testing the API:

```
curl -X POST -F 'file=@customer_reviews.xlsx' http://127.0.0.1:5000/analyze
```

## Results & Analysis

The sentiment analysis provides insights into customer feedback. The Groq LLM API returns sentiment scores for positive, negative, and neutral sentiments. Limitations include reliance on the Groq API for accuracy and performance. Potential improvements include using custom models for better accuracy and expanding the analysis to support multiple languages.

## Conclusion

The Sentiment Analysis API successfully processes customer reviews, performs sentiment analysis using the Groq LLM API, and returns structured results. Future improvements could include adding more sophisticated error handling and expanding the scope of sentiment analysis.