

GenAI

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Section: 6 'C'

Problem Statement:

Customer Feedback Analyzer

- **Goal:** Analyze 100s of product reviews to see if people are happy or angry.
- **Tech:** `pipeline('sentiment-analysis')` (Positive/Negative classification).

Abstract:

Customer feedback helps in understanding user satisfaction and improving product quality. Manually analysing large amounts of feedback is time consuming and may allow human bias. The Customer Feedback Analyser automatically determines the sentiment of customer reviews using NLP. It leverages a pretrained transformer-based model provided by the Hugging Face sentiment-analysis pipeline to classify reviews as positive or negative along with a confidence score.

The analyser accepts both predefined datasets and user input. To observe how the model labels "neutral" reviews, I have given a few ambiguous reviews as input as well, to see the limitations of binary sentiment models in capturing nuanced human opinions.

This project shows the applicability of pretrained language models for real-world text analytics and shows the importance of understanding model limitations when interpreting sentiment predictions.

Documentation:

This project focuses on understanding how customer feedback can be automatically analysed using NLP techniques. I understood that the goal of this project was to build a system that can identify whether a given customer review expresses positive or negative sentiment, while also seeing how the real-world feedback containing ambiguous or mixed opinions is tackled.

To achieve this, a Customer Feedback Analyser was developed using a pretrained transformer-based sentiment analysis model from the Hugging Face library. The system accepts both predefined datasets and real-time user input, processes the text using the Hugging Face sentiment-analysis pipeline, and outputs a sentiment label along with a confidence score. The model performs well on clearly polarised reviews, while ambiguous feedback highlights the limitations of binary sentiment classification. A surprising observation was made where although it labels reviews having obvious words like "good" or "bad" accurately. Ambiguous reviews had a lot of wrong/debatable labels, showing the limitations for these "neutral" reviews. Even reviews like "**I'm neutral about this product**" returned a sentiment of "NEGATIVE", even more surprisingly, it had a confidence score of 1.

Review: I'm neutral about this product.
Sentiment: NEGATIVE (Confidence: 1.00)

Sample Output:

1. Simple reviews

```
Review: This product is amazing. I loved it.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: Worst purchase ever. Completely useless.  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: The mobile is bad  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: The mobile is bad, but I like it.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: The mobile is good  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: The mobile is good, but I hate it.  
Sentiment: NEGATIVE (Confidence: 0.97)  
-----  
Review: This product is amazing and works exactly as described.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: Very satisfied with the quality and performance.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: Excellent build quality and fast delivery.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: I love this product, totally worth the money.  
Sentiment: POSITIVE (Confidence: 1.00)
```

2. Ambiguous reviews

```
Review: The product works fine most of the time, but occasionally it just stops responding.  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: I like the features, although the overall experience feels a bit underwhelming.  
Sentiment: POSITIVE (Confidence: 0.97)  
-----  
Review: Not exactly what I expected, but it's still usable.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: The quality is good, yet somehow it doesn't feel worth the price.  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: It does what it's supposed to do, nothing more, nothing less.  
Sentiment: POSITIVE (Confidence: 0.99)  
-----  
Review: Some parts are really well designed, others feel rushed.  
Sentiment: POSITIVE (Confidence: 0.88)  
-----  
Review: I wouldn't say I'm unhappy, but I'm not impressed either.  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: It started off great, but the performance dropped after a few weeks.  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Review: Decent product, though I'm unsure if I would recommend it.  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Review: The functionality is solid, but the user interface is confusing.  
Sentiment: NEGATIVE (Confidence: 1.00)
```

3. Real user reviews (Lalbagh)

```
Enter a customer review (or type 'exit' to quit): The yearly Lalbagh Flower Show is truly a feast for the eyes. Spread across the historic botanical garden, the show  
Sentiment: POSITIVE (Confidence: 1.00)  
-----  
Enter a customer review (or type 'exit' to quit): It is a historic botanical garden, but unfortunately the overall condition is not at its best at the moment. Mainten  
Sentiment: NEGATIVE (Confidence: 1.00)  
-----  
Enter a customer review (or type 'exit' to quit): exit
```

Github Link:

<https://github.com/pes2ug23cs147/GenAI-PES2UG23CS147>