



Tweet Sentiment Analysis

Prepared by group 9



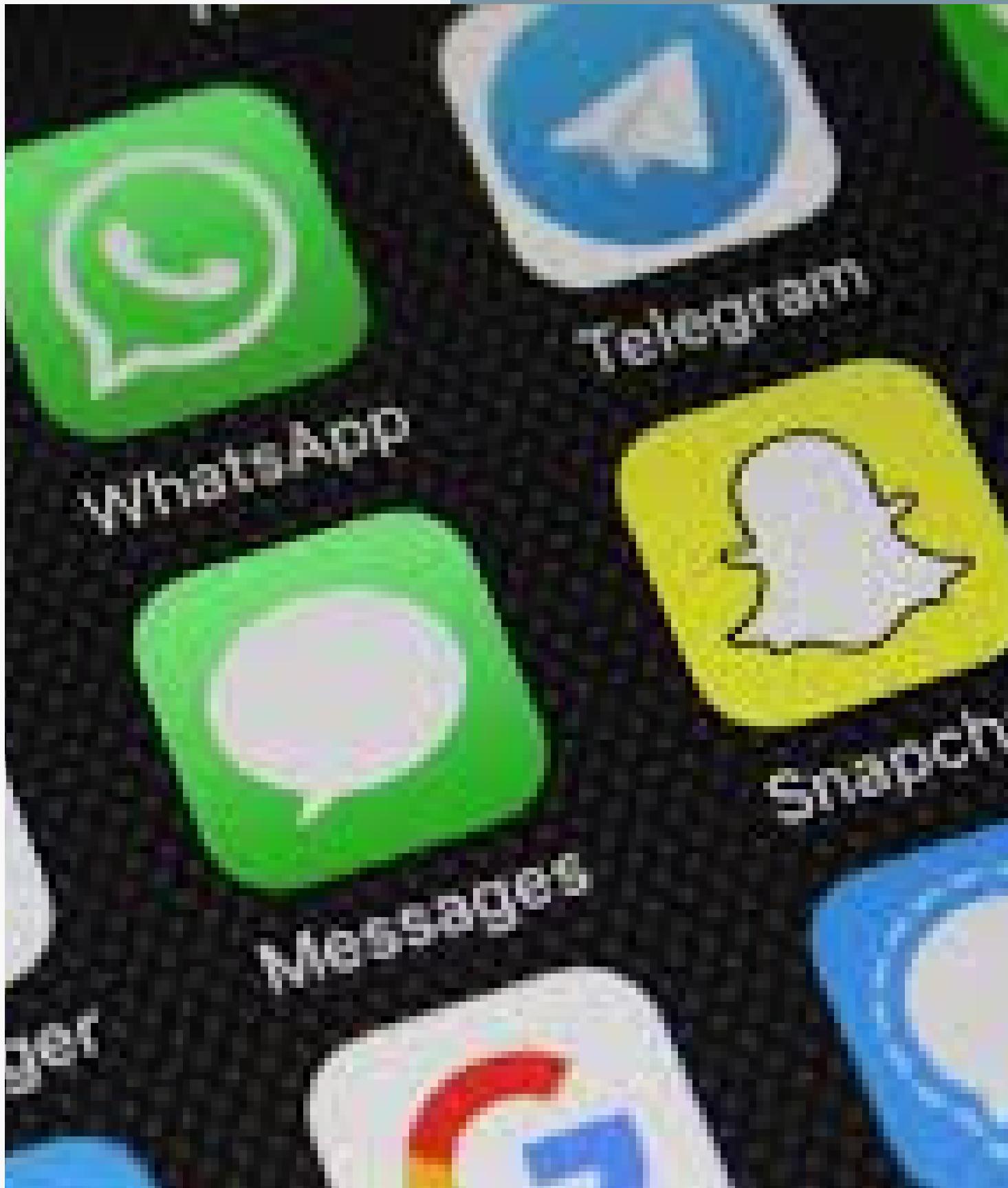


Introduction

This project aims to classify sentiments in tweets mentioning Apple and Google products into three categories: positive, neutral, or negative. Sentiment analysis is a key application of natural language processing (NLP) that helps organizations understand public opinion at scale.

Overview

Giants like Apple and Google rely on constant user feedback for crucial decisions, the overwhelming volume of social data—thousands of tweets daily—makes manual analysis obsolete. Our solution leverages machine learning to provide real-time sentiment detection, giving brands an immediate, accurate understanding of what their users really think.



Problem Statement

Leading companies like Apple and Google are highly dependent on customer perception. With users sharing continuous feedback on platforms like Twitter (X), extracting meaning from the massive data flow is challenging. To address this, we've developed classification models that accurately determine the sentiment within these tweets.





Objectives

- To explore and analyze the tweet data between the two companies
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To develop and evaluate classifier performance using appropriate metrics



- To preprocess the data using Natural Language Processing techniques.
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- To provide actionable, data-driven insights and recommendations
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- To successfully deploy the model into the production environment
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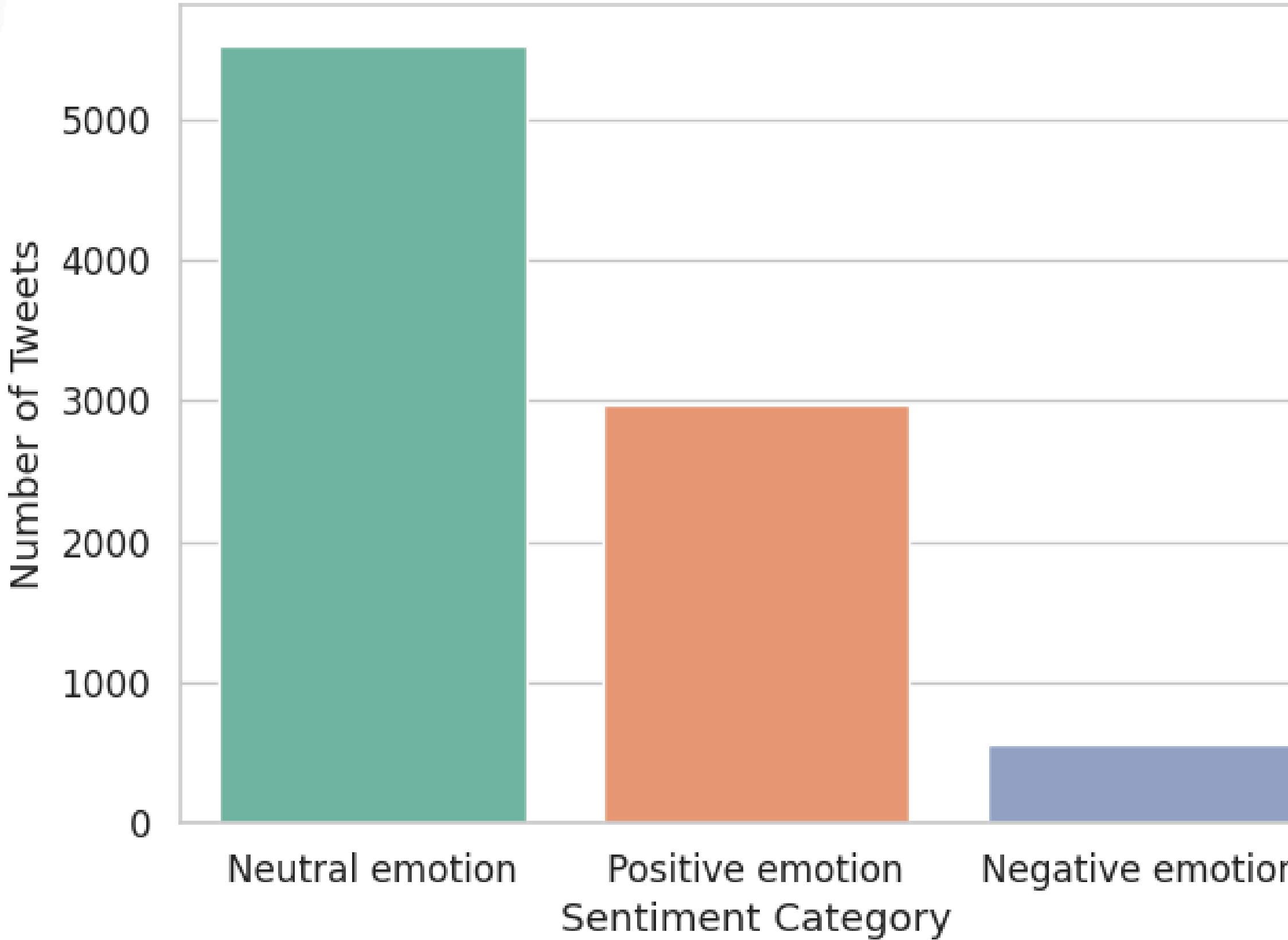




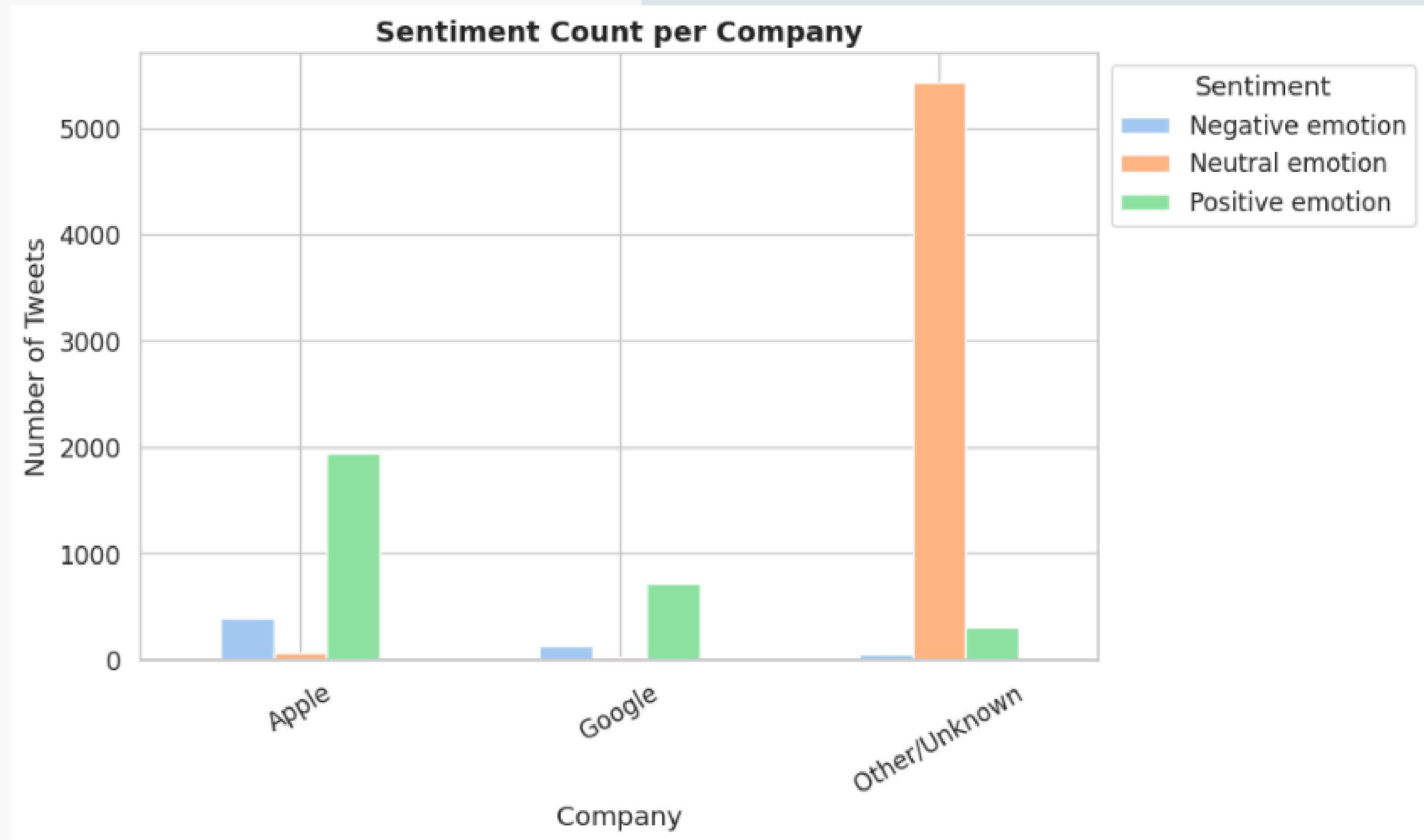
Analysis



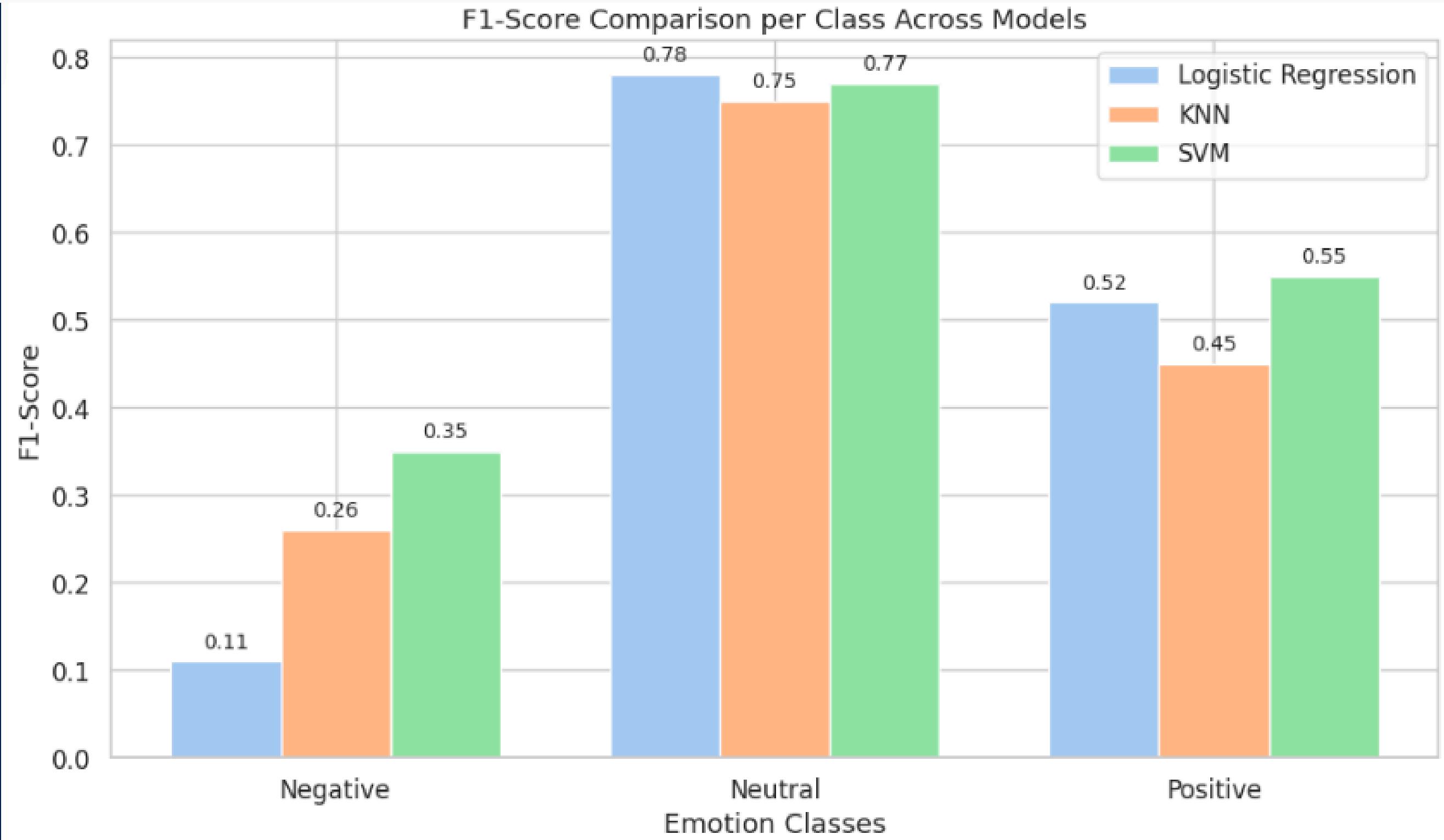
Overall Sentiment Distribution



- Most tweets were neutral, followed by positive.
- Tweets expressing strong emotion (good or bad) often mentioned features



- Apple has a higher Positive emotion than Google
- Apple also received a lot more tweets than Google



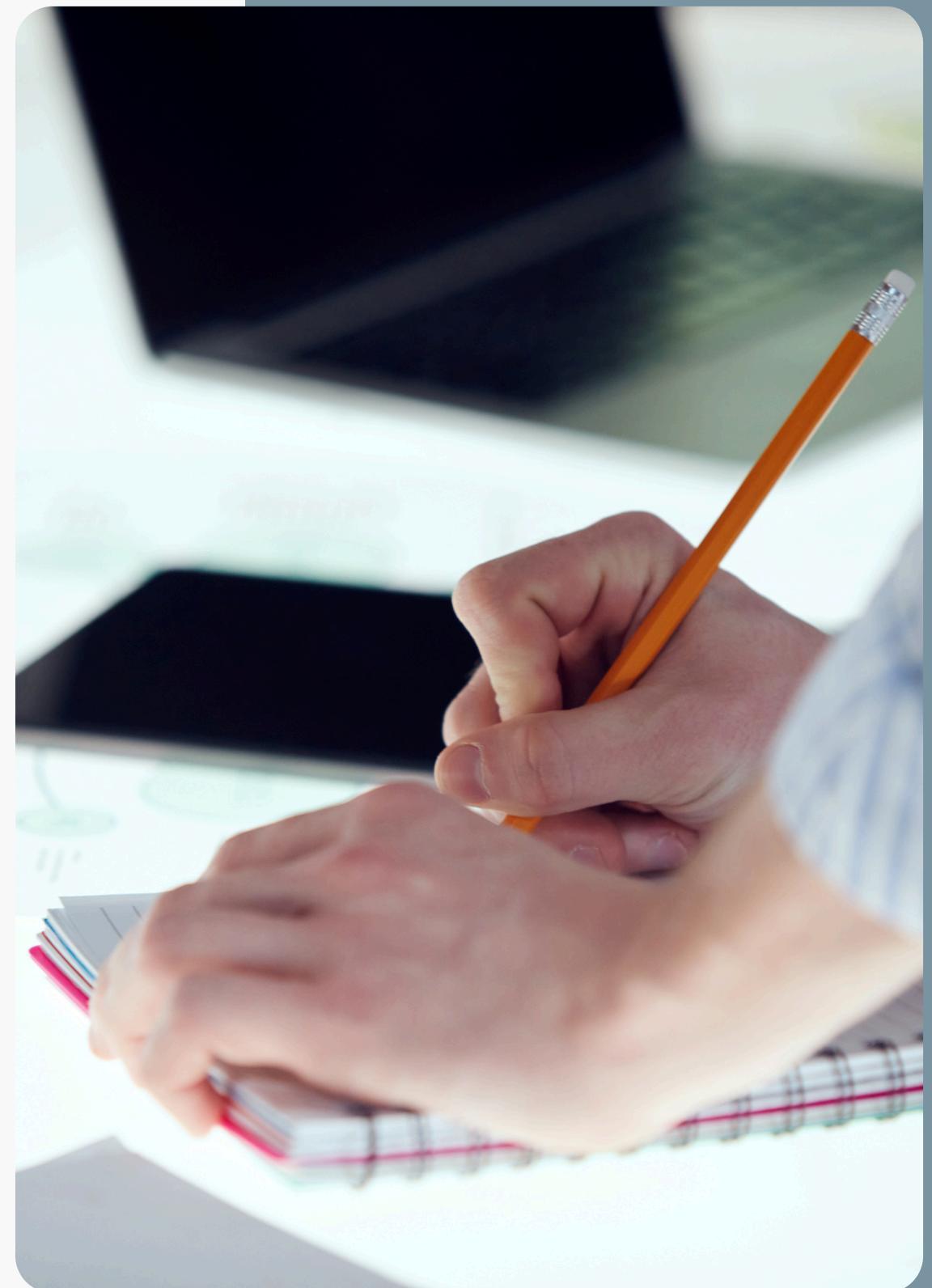
- The SVM model demonstrated the best overall performance, achieving the highest F1-Scores for both the Negative (0.35) and Positive (0.55) emotion classes.

Methodology

We trained a model to recognize patterns in the words people use. For example:

- A tweet saying “My iPhone keeps overheating after the update. Totally annoying” gets flagged as negative
- One saying “Installed the latest iOS update this morning, no issues so far” gets flagged as positive

We tested several models and found that a SVM model worked best. It achieved solid F1-score, and could generalize well to unseen tweets.



Conclusion

- **Strong Performance on Extreme Sentiments:** The model is highly effective at identifying explicit Negative emotions.
- **Market Intelligence:** Analyzing trends in sentiment over time provides valuable, quantifiable market feedback for executives.
- **Neutral Class Ambiguity:** The model struggles with the subjectivity of Neutral sentiment, which often includes complex, non-emotional statements rather than a true lack of feeling.



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Thank you

