



# **Tweet Sentiment Analysis**

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# Business Case

Apple and Google are looking to analyze what people are saying about their brand in twitter. People use twitter to share their impulsive yet honest thoughts and opinions. This can provide brands a good idea on what consumers are really feeling about their products.

In order to achieve this, we will take the following steps:

## **EDA:**

- \* Explore the contents of the tweet to identify the product and sentiment of the tweet.
- \* Analyze the sentiments to identify common issues or contentment expressed by the user.
- \* Make meaningful recommendations to the brands that they can use to serve their customers better.

## **Modelling:**

- \* Build a model that can classify the tweets into positive, negative or neutral emotions.
- \* Deploy the model for production to track customer sentiments in real-time.

# Assumptions

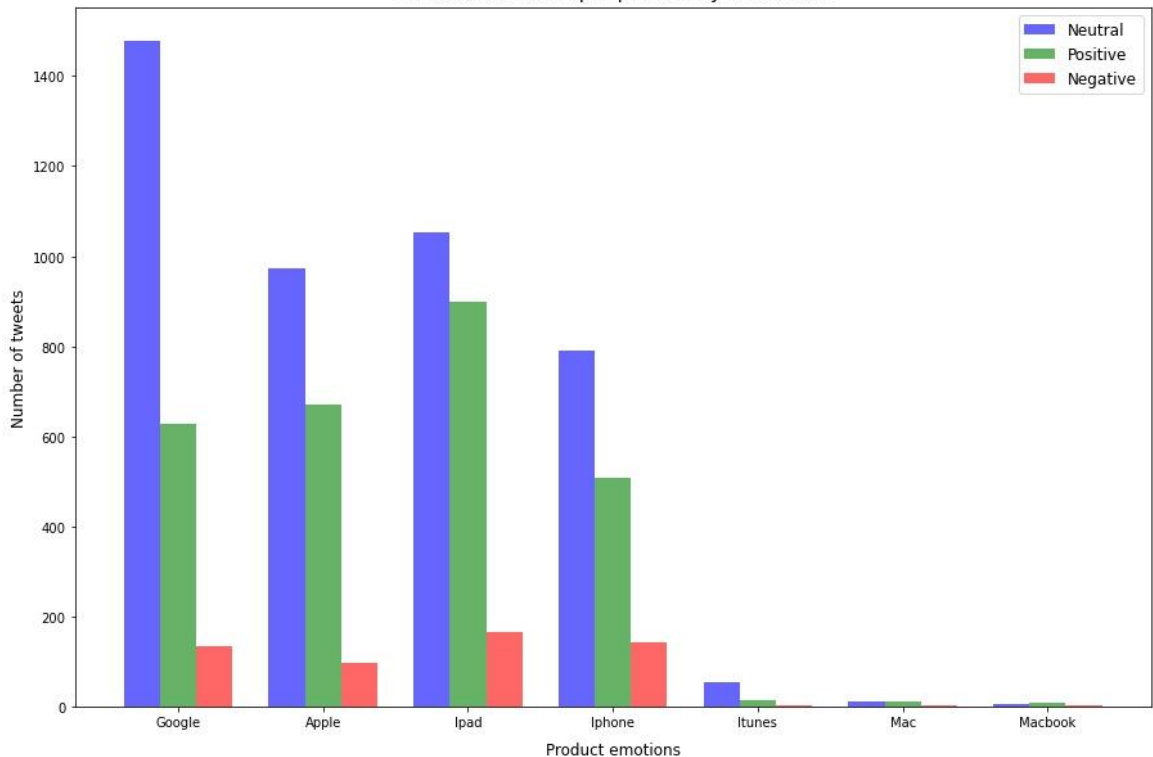
- Emotions expressed in the tweets are the best available representation of people's sentiment towards each brand.
- All the tweets posted are true and unbiased form of opinions.

# Limitations

- The dataset consists of only 9,000 tweets with huge class imbalances.
- All tweets are from a particular event and location.

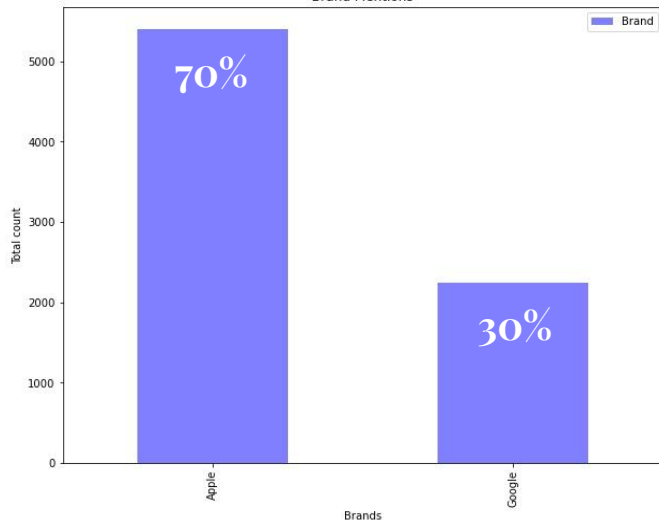
# Identify the product and sentiment expressed by the user

Number of tweets per product by sentiment


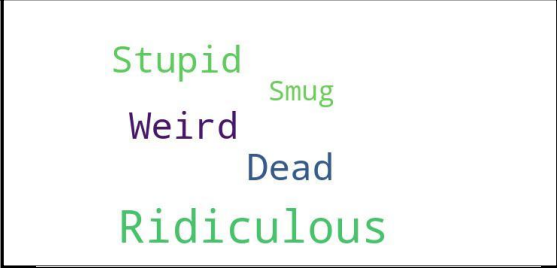
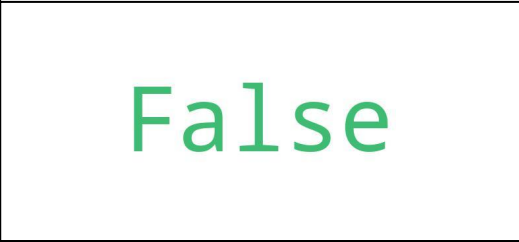



Apple is shown to have more customer engagement than Google.

Brand Mentions



# Analyze the most common expressions

Apple Positives	Apple Negatives
 <p>Brilliant Nice Hot Cool Great Awesome</p>	 <p>Stupid Smug Weird Dead Ridiculous</p>
Google Negatives	Google Positives
 <p>False</p>	 <p>Big Great Major</p>

- Customers seem to be praising the brands for the most part.
- There are some concerns raised for Apple, but nothing imminent for Google.

# Recommendations

## Apple:

- Apple is pretty well-known for all its products and is referred to as the 'cooler' one of the two.
- Customers show little to no interest in macs and macbooks. However, there seems to be some potential in iTunes.
- Product development or differentiation in the media service industry could help Apple capture more people towards its brand.

## Google:

- Google has an overall strong presence as a major tech company.
- However, it needs to engage more with the customers to maintain brand loyalty.

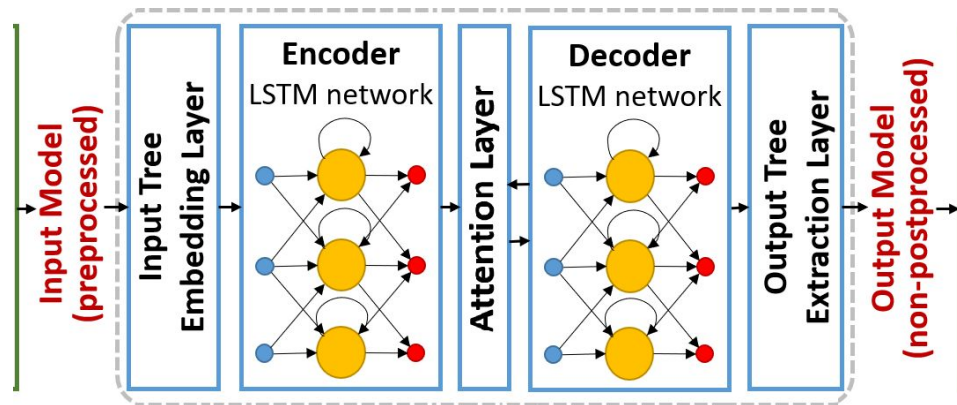
# Tweet sentiment predictor

The model uses RNN with a LSTM architecture.

Regularization parameter: L2

Activation = 'sigmoid'

Accuracy = 65.44 %



A word cloud featuring the phrase "thank you" in numerous languages and scripts. The words are arranged in a circular pattern, with "thank you" in large red letters at the center. Other prominent words include "danke" (blue), "gracias" (green), "merci" (orange), "teşekkür ederim" (pink), "dank je" (green), "sukriya" (purple), "kop khun krap" (green), "go raibh maith agat" (purple), "arigatō" (pink), "dakujem" (orange), "merci" (orange), "sagolun" (blue), "dziękuje" (purple), "obrigado" (green), "bedankt" (yellow), "spasibo" (brown), "rahmat" (brown), "ngiyabonga" (brown), "tapadh leat" (brown), "xhala" (brown), "asante" (brown), "manana" (brown), "tenki" (brown), "mochchakkeram" (blue), "mamnun" (blue), "trugarez" (blue), "merci" (blue), "shukriya" (blue), "dhanyavadagalu" (blue), "diolch" (blue), "euxhariotw" (blue), "xiexie" (blue), "감사합니다" (blue), "তোমাকে ধন্যবাদ" (blue), "kam sah hamuda" (blue), "rahal" (blue), "najs tuke" (blue), "terima kasih" (blue), "arigatō" (blue), "dakujem" (blue), "trugarez" (blue), "merci" (blue), "shukriya" (blue), "dhanyavadagalu" (blue), "diolch" (blue), "euxhariotw" (blue), "xiexie" (blue), "감사합니다" (blue), "তোমাকে ধন্যবাদ" (blue), "kam sah hamuda" (blue), "rahal" (blue), "najs tuke" (blue), "terima kasih" (blue). The colors used include red, blue, green, orange, pink, purple, yellow, brown, and grey. The background is white.



# Appendix

- Create bi-grams and calculate it's PMI to capture a pair of words which could have a better meaning.
- Deploy model in AWS Sagemaker to classify tweets in real-time.