Twitter Sentiment Analysis

Volha Puzikava
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Disclaimer

The described analyses fulfill educational purposes only. The hypothetical business case and the results of sentiment analysis should not be perceived as real customers' attitudes and served as a push for remedial actions, as they have not been approved by any professional media organization.

Overview

Sentiment analysis/ opinion mining

approach to identify the emotional tone behind a body of text and categorize pieces of writing as positive, negative or neutral.

Overview Cont'd

Sentiment analysis:

- ➔ understand how customers feel about brand
- ➔ provide insights to improve products and services
- ➔ make business more responsive to customer feedback
- ➔ react quickly to negative sentiment and turn it around
- ➔ monitor brand's reputation in real-time
- ➔ keep customers happy by always putting their feelings first

Overview Cont'd

This Project:

analyzes Twitter sentiments about Apple and Google products to better understand how people feel about them

Outline

1) Business Problem
2) Data Understanding
3) Part I: Supervised ML Algorithms:
    a) *Data Preparation and Exploration*
    b) *Data Modeling*
    c) *Model Evaluation*
4) Part II: Neural Networks:
    a) *Data Preparation and Exploration*
    b) *Data Modeling*
    c) *Model Evaluation*
5) Conclusions

Business Problem

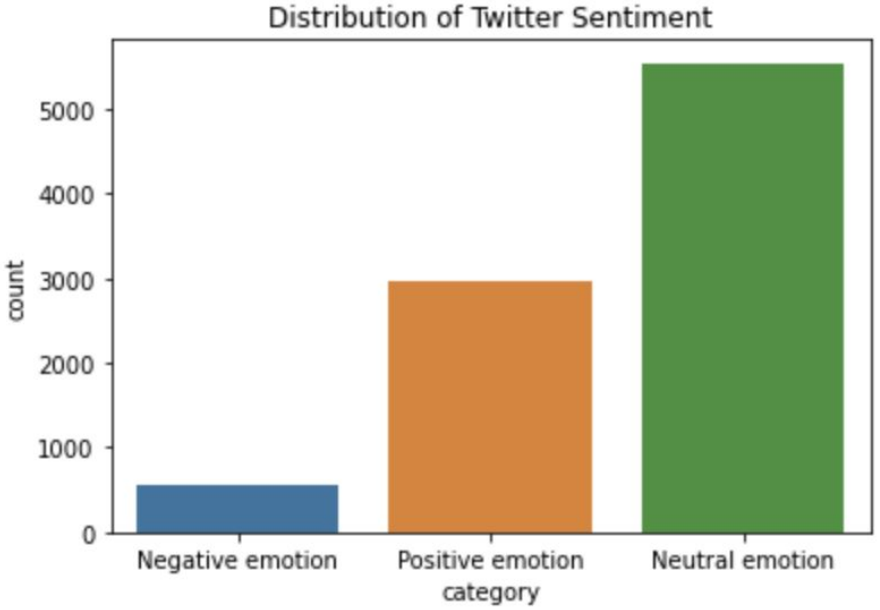
Tweeter Home Entertainment Group asked

- to analyze Twitter sentiment about Apple and Google products
  - ➔ to monitor brands
  - ➔ to understand customers needs

The main purpose

- to *build model* that could
  - ➔ rate the sentiment of a Tweet based on its content
  - ➔ give insights how people feel about products

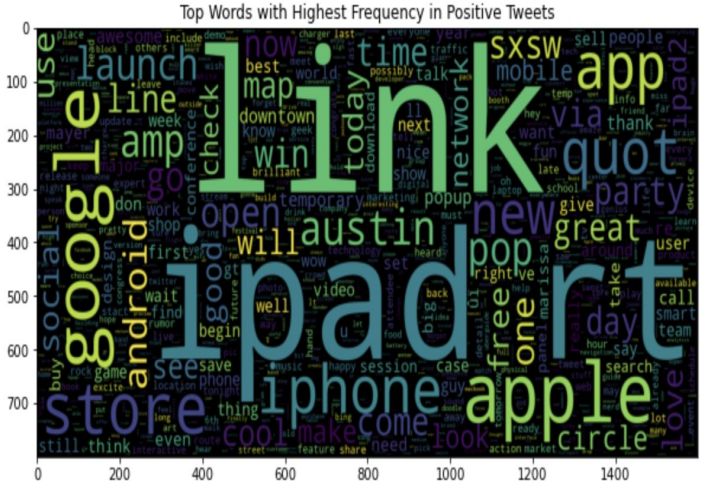
Data Understanding



- over 9,000 Tweets taken from CrowdFlower via data.world links
- *imbalanced multiclass classification problem*
- all classes equally important
- *evaluation metric*: model's ability to both capture Tweets and be accurate with those Tweets (F1 score)

Part I: Supervised ML Algorithms

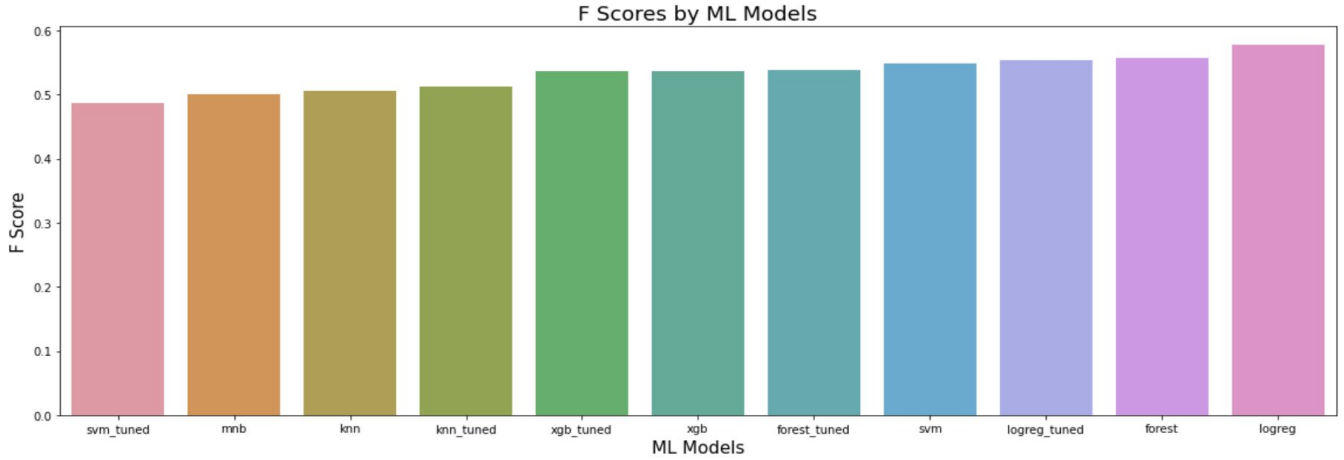
1. Text made *lowercase*, hashtags and @mentions removed, set of *tokens* generated
2. Distribution of *top 10 tokens* plotted for each category
3. Words transformed to *vectors*
4. Negative and positive categories *oversampled*



Supervised ML Algorithms Cont'd

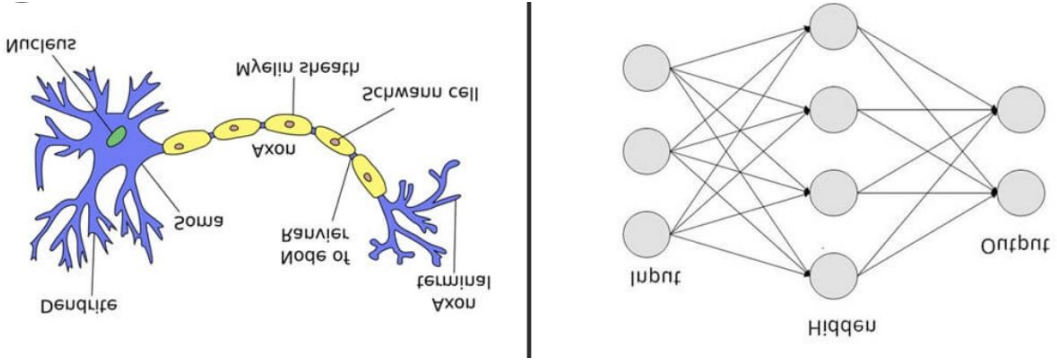
5. Different *ML algorithms* built

6. ***Best model***: F1 score = 58%



Part II: Neural Networks

1. Textual data transformed into *numerical representation*
2. Text reformatted into *matrix of vectors*
3. Descriptive categories converted into *integers product*
4. Data *rebalanced*



Neural Networks Cont'd

5. Various *neural networks models* tried out

6. ***Best model:*** F1 score = 65%

top-performing model

Conclusions

- ➔ **Best Model**: Neural Networks with F1 score of 65%
- ➔ Not the perfect result
- ➔ *Reason*: limited size of the dataset
- ➔ *Important*: quality and quantity of data

Thank you!

Email: helga.mikel@gmail.com
GitHub: @VolhaP87
LinkedIn: https://www.linkedin.com/in/volha-puzikava