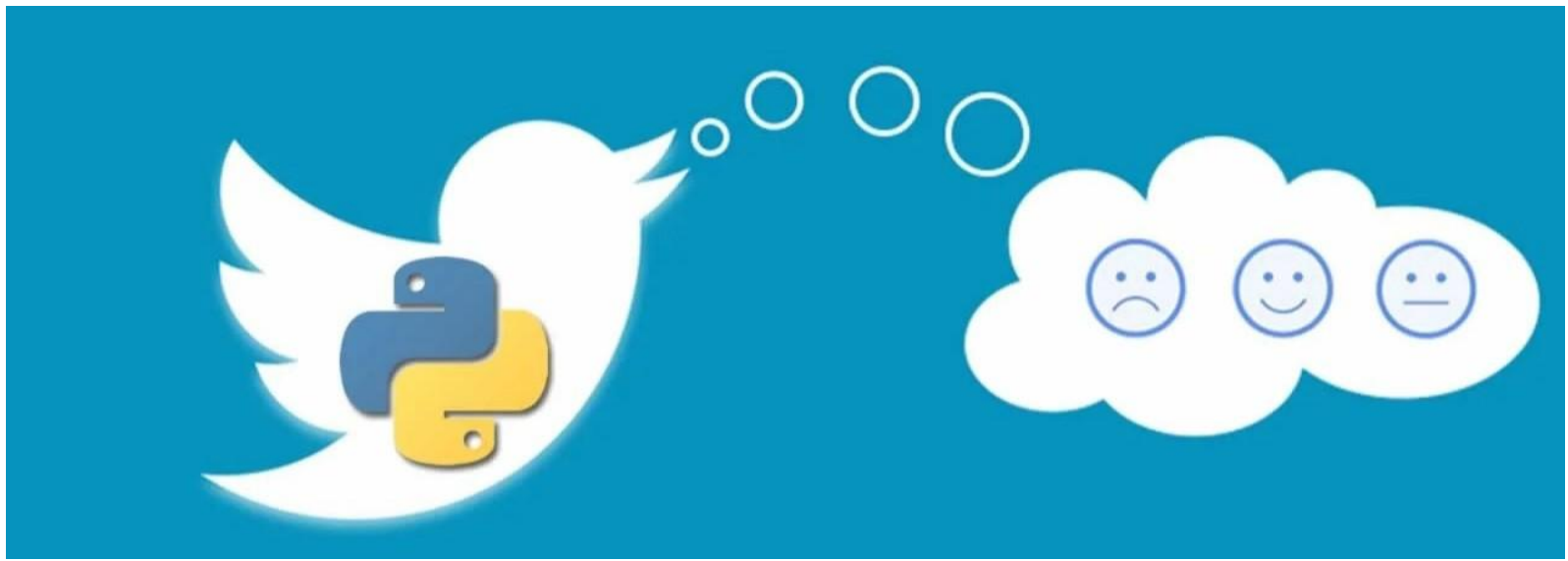


# Tweet Sentiment Analysis

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## Summary

An investment company wants to invest in stock of one of two companies, Apple and Google.

- Sentiment emotion rates
- Keywords found in tweet sentiments
- Summary to help make decision.



# Outline

- Business Problem
- Data
- Methods
- Results
- Conclusions

# Business Problem

- Collecting information to make a decision before investing in stock of one of two companies, Apple and Google
- Interested in market performance based on customer reviews
- One way to study is to check customers' tweet sentiments.
- Which company has more worth investing in?

# Data

- More than 9000 tweet texts
- Each text with information on brand and emotion

- Brand

Apple	iPhone, iPad, Apple, Other Apple products or services
Google	Android, Google, Other Google products or services

- Emotion - Positive, negative, and neutral (no emotion)

- No emotion - questions, requests, answers, general information

- Texts without brand information - 5,801 (64%)

# Methods - Assign Categories

- Texts with Brand Information (36% of data)

From	iPhone, iPad	Others on Apple	Android	Others on Google
To	Apple Mobile	Apple Other	Android	Google Other

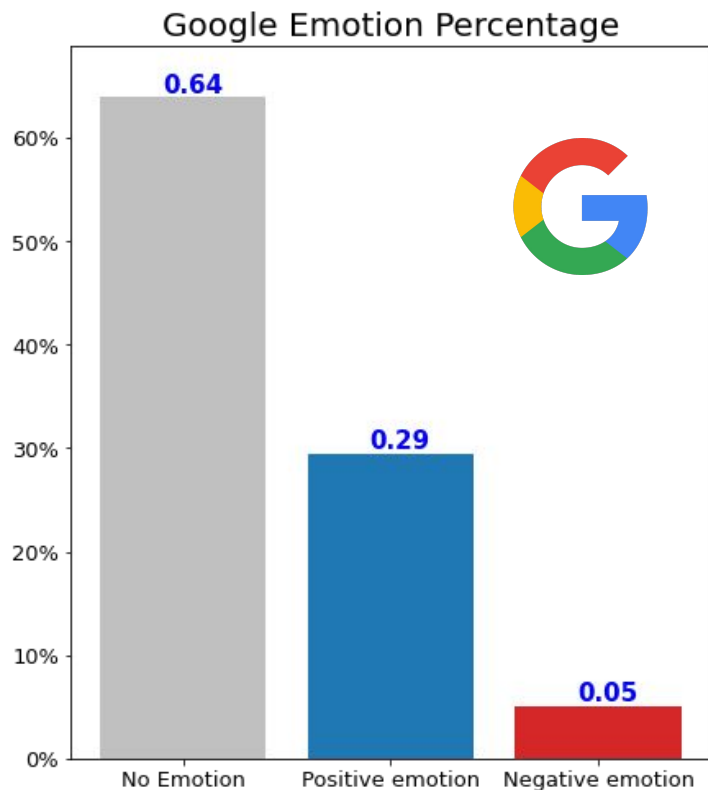
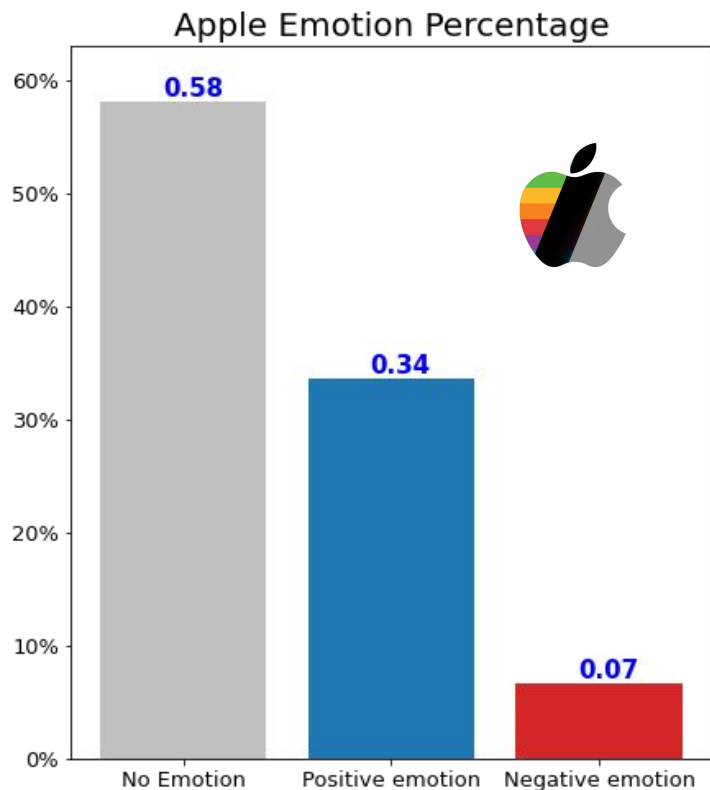
- Texts without Brand Information (64% of data)
  - Separate each **text** in to a list of words
  - Analyze the **list** and assign categories
    - iPhone, iPad -> Apple Mobile
    - Android -> Google Mobile
  - Accuracy - **89%** from test on available brand information
  - Make texts useful for more data and better performance

# Methods - Finding Keywords in Product Reviews

- Keywords are a summary of sentiments. They help organizing text information.
- Select a category
  - E.g. Apple's mobile sentiments
- Text separation into a list of words, then combine the lists
  - “iPhone is good” → “**iPhone**”, “**is**”, “**good**”
- Count unique words, then sort by counts
  - “iPhone”, “is”, “good”, “iPad”, “works”, “good” → “**good**” = 2, “**iPhone**” = 1, “**iPad**” = 1

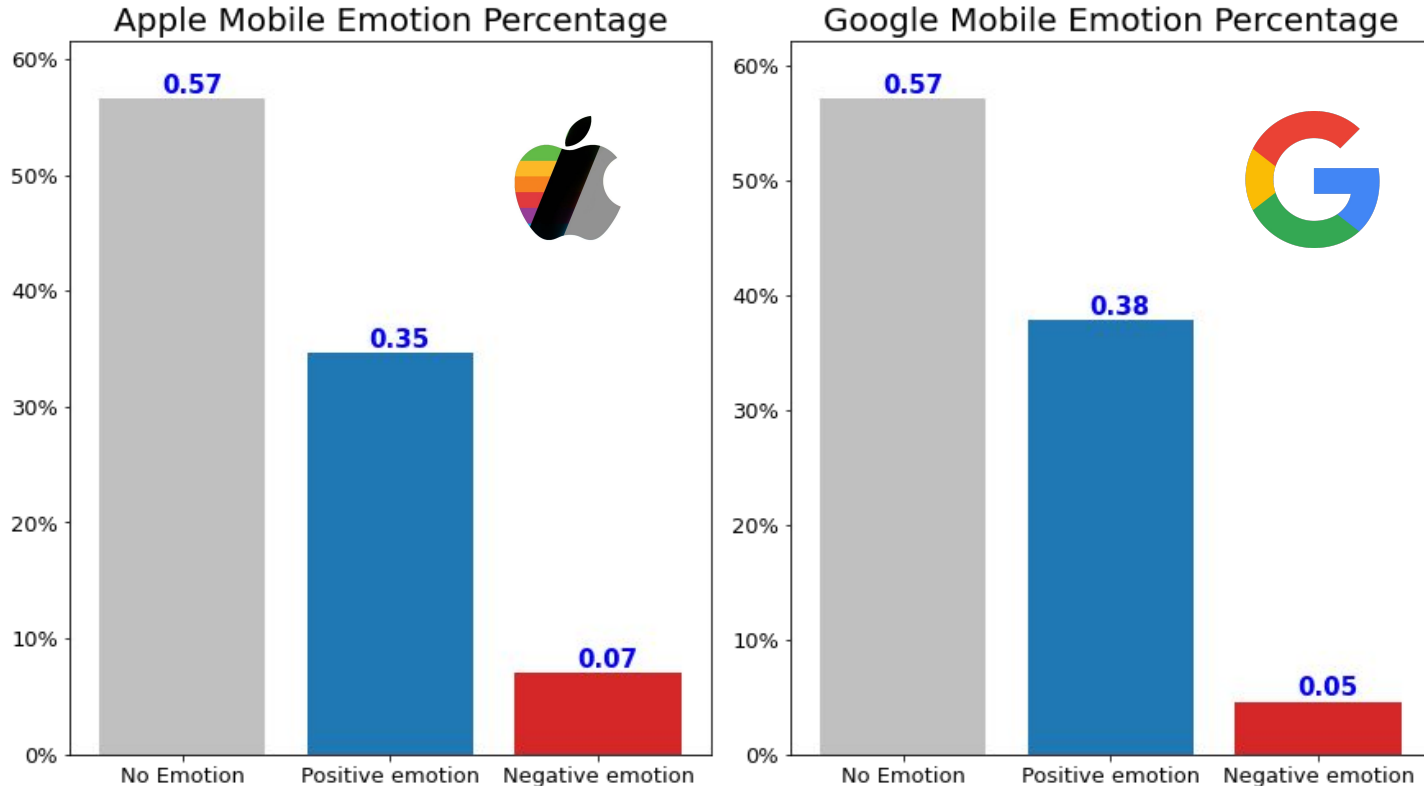
Apple	Google
<b>sxsw, link</b> , store, new, austin	<b>sxsw, link</b> , party, mayer, new

# Results - Overall Emotion Percentage Comparison

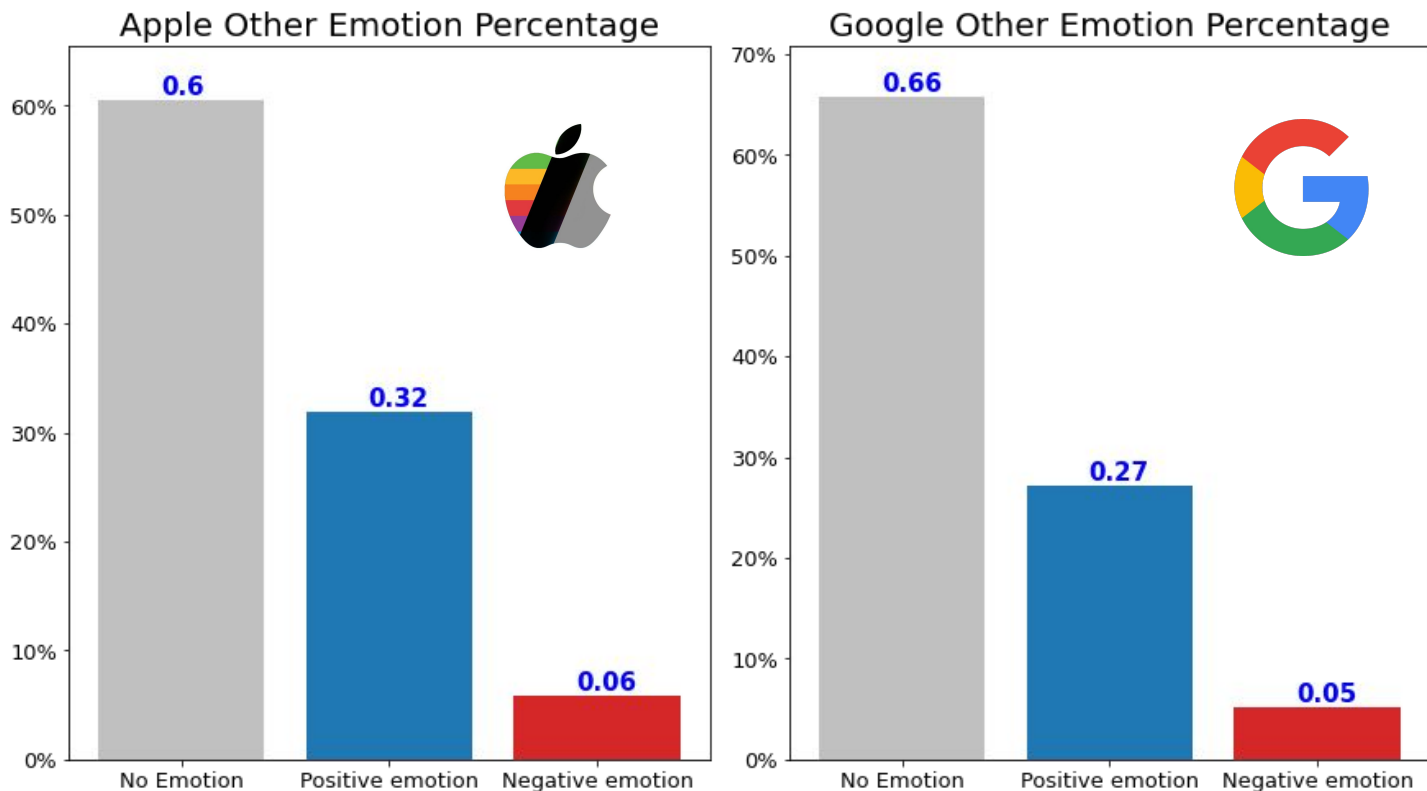




# Results - Emotion Percentage Comparison on Mobile



# Results - Emotion Percentage Comparison on Others



# Conclusion - Recommendation

- Ratio = number of negative / number of positive
- Lower ratio → lower number of negatives based on number of positives

# of sentiments	Overall		Mobile		Others	
	Apple	Google	Apple	Google	Apple	Google
Positive	2,417	561	1,559	156	858	405
Negative	473	97	317	19	156	78
Ratio (n/p)	20%	17%	20%	12%	18%	19%

- Investing in Google is recommended vs. Apple because Google has a lower ratio.

# Conclusion - Keywords

Apple's Positive Sentiments	Google's Positive Sentiments
<b>sxsw</b> , <b>link</b> , store, <b>app</b> , <b>new</b> , austin, launch, line, cool, circles	<b>sxsw</b> , <b>link</b> , party, <b>app</b> , <b>new</b> , mayer, great, mobile, social, search

- Other than 'sxsw', 'link', 'app', 'new', two brands have different keywords found in their sentiments.

## Next Step

- **Select tweets including one or more keywords.** There are several words that appear in tweets much more frequently than the rest words. We can try to compare the positive rates based on tweets containing one or more keywords.
- **Investigate SXSW.** The most frequent keyword in sentiments is SXSW. It might mean something to go deeper with SXSW.
- Share the full list of keywords with the client.

# Thank You!

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