

# **SENTIMENT ANALYSIS OF REDDIT SOCIAL MEDIA DATA ON ‘TESLA STOCK’**

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# Introduction

- ▶ The growth of Electronic Vehicle industry is on ascendancy in resent years.
- ▶ This could be partly attributed to value of the industry and its potential positive impact on critical global challenges such as SDG goal 7 (Affordable and clean energy) and goal 13 (climate action)
- ▶ Tesla 2022 impact report, revealed that customers have avoided releasing 13.4 million metric tons of CO<sub>2</sub> into the atmosphere by using tesla cars and products.
- ▶ This fact among others, makes investing in the electronic vehicle industry highly attractive.

# Introduction Cont'

- ▶ However, to undertake strategic investment in the automotive industry it is important to be guided by data to make an informed decision.
- ▶ Therefore, in this study reddit social media data was used for sentiment analysis to gauge user's opinion about 'tesla stock'
- ▶ Sentiment analysis is often used by businesses to detect sentiment in social data, gauge brand reputation, and understand customers

# Data of Source

- ▶ The data considered in this study was sourced from reddit.com
- ▶ Reddit is a popular social media platform and website which serves as a home to thousands of communities who participate in discussions, share content, and engage with a wide range of issues or topics.
- ▶ It is essentially a collection of forums, known as "subreddits," each focused on a specific subject or theme
- ▶ In this study, the subreddit or topic considered was about 'Tesla stock'

# Sample Data retrieve from reddit

No.	submissions (users post)
1	Elon Musk is now a drag on TSLA
2	Is Tesla a good buy?
3	r/teslastock Lounge
4	Tesla will up?
5	3tsl etf. I bought 5000 shares for £13000 at 2...
6	I may just go on and buy Tesla Stock just beca...
7	Tomorrow 700\$
8	Tesla stock price
9	tesla stock question
10	Why you should probably WAIT to invest in Tesla

# Data Visualization (Word cloud)

- ▶ Frequency of words used in user's post regarding 'tesla stock'



# Sentiment Analysis

```
Q ✓ [11] #a function to determine the subjectivity of users post
          def getSubjectivity(text):
                  return TextBlob(text).sentiment.subjectivity

{x}                                     #a function to determine the polarity of users post
          def getPolarity(text):
                  return TextBlob(text).sentiment.polarity

          ▶ 0s #function to return negative, neutral and positive sentiment of users
          def getAnalysis(score):
                  if score < 0:
                      return 'Negative'
                  elif score == 0:
                      return 'Neutral'
                  else:
                      return 'Positive'
```

# Sentiment Analysis Cont'

No	submissions	subjectivity	polarity	Analysis
0	Elon Musk is now a drag on TSLA	0.070833	-0.100000	Negative
1	Is Tesla a good buy?	0.600000	0.700000	Positive
2	r/teslastock Lounge	0.000000	0.000000	Neutral
3	Tesla will up?	0.000000	0.000000	Neutral
4	3tsl etf. I bought 5000 shares for £13000 at 2...	0.625000	0.500000	Positive
5	I may just go on and buy Tesla Stock just beca...	0.000000	0.000000	Neutral
6	Tomorrow 700\$	0.000000	0.000000	Neutral
7	Tesla stock price	0.000000	0.000000	Neutral
8	tesla stock question	0.000000	0.000000	Neutral
9	Why you should probably WAIT to invest in Tesla	0.000000	0.000000	Neutral
10	What's with Tesla share prices?	0.000000	0.000000	Neutral
11	Im looking for a community of tesla traders on...	0.000000	0.000000	Neutral

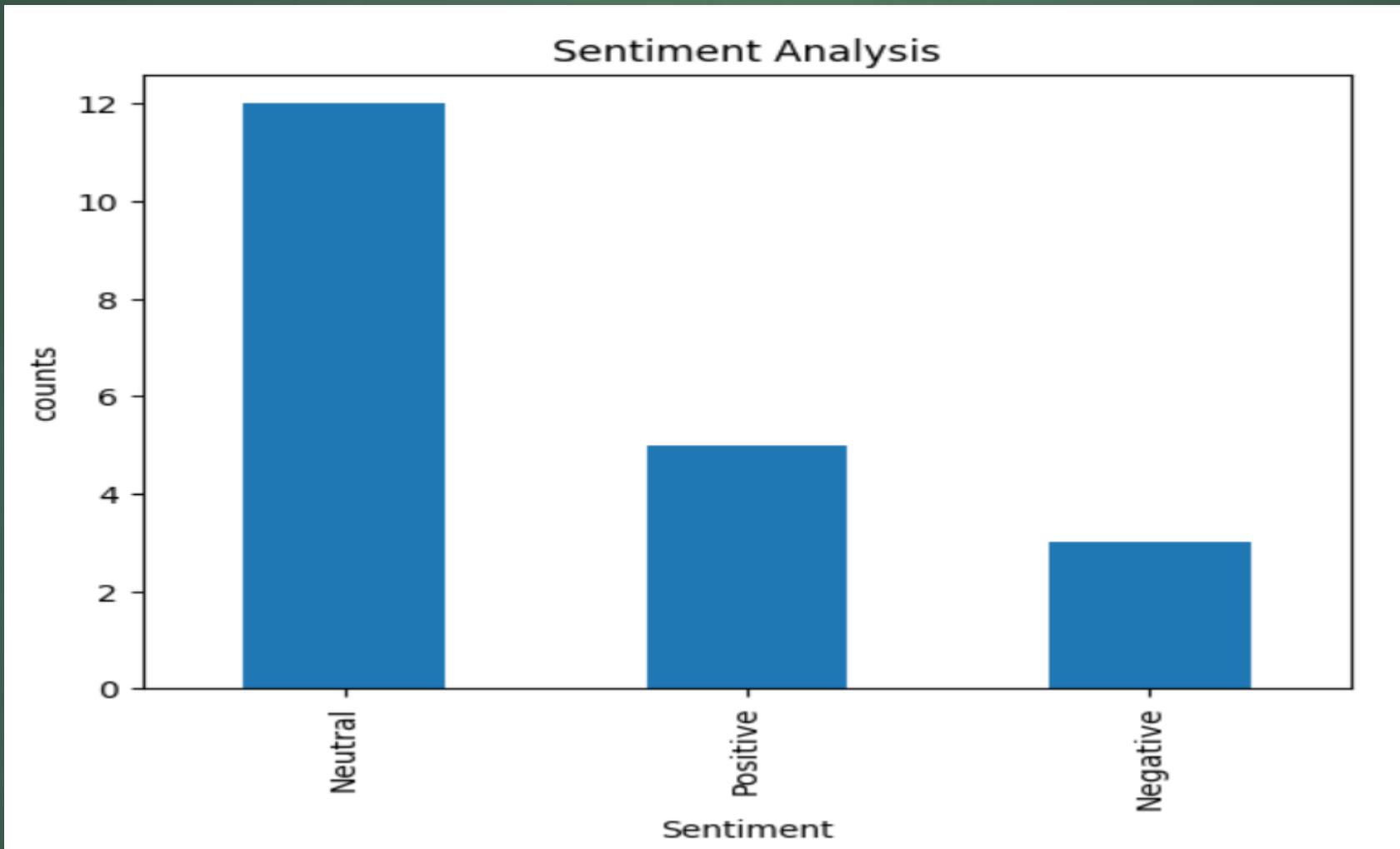
# Sentiment analysis (Bar chart)

A Bar Chart was created to show the relationship between polarity and subjectivity

Polarity represents the sentiment orientation (Negative, Neutral or Positive)

Subjectivity measures how subjective or opinionated user's post on tesla stock were(0 to 1)

# Sentiment Analysis - Bar Chart



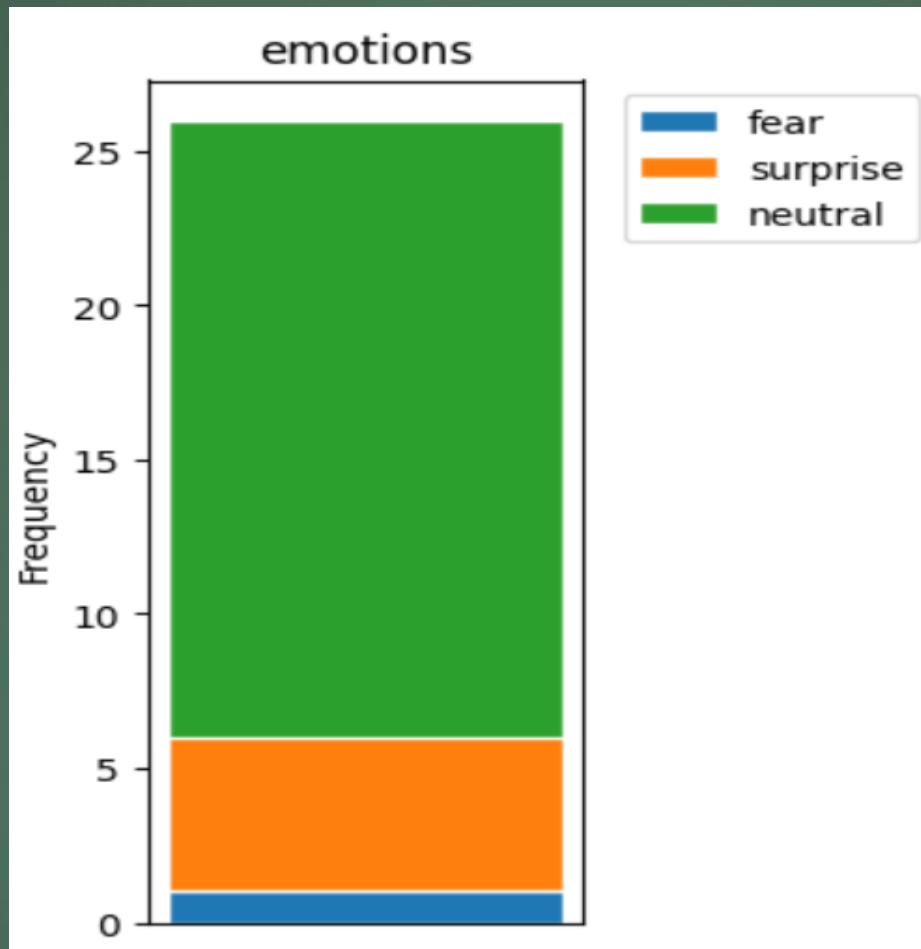
# Emotions detections

- ▶ The bar chart in relation to sentiment analysis could not provide enough basis for me to take actionable decision to invest or not to invest in the stock.
- ▶ Even though, it generally revealed majority of user's were neutral with a reasonable number showing positive sentiment than negative.
- ▶ Having seen the sentiment of of the user's post, a further drill down of the data was considered to determine user's emotions for an actionable decision to be taken.
- ▶ Emotions were determined using the Hugging face transformer pipeline

# Emotional Detection

No.	submissions	subjectivity	polarity	Analysis	emotions
0	Elon Musk is now a drag on TSLA	0.070833	-0.100000	Negative	neutral
1	Is Tesla a good buy?	0.600000	0.700000	Positive	surprise
2	r teslastock Lounge	0.000000	0.000000	Neutral	neutral
3	Tesla will up?	0.000000	0.000000	Neutral	neutral
4	3tsl etf. I bought 5000 shares for £13000 at 2...	0.625000	0.500000	Positive	fear
5	I may just go on and buy Tesla Stock just beca...	0.000000	0.000000	Neutral	neutral
6	Tomorrow 700\$	0.000000	0.000000	Neutral	neutral
7	Tesla stock price	0.000000	0.000000	Neutral	neutral
8	tesla stock question	0.000000	0.000000	Neutral	neutral

# Emotions Detection – Stack bar



# Conclusion

The sentiment analysis of Tesla stock gave me valuable insight about investing in the company's stock

Emotion distribution shows a variety of emotions expressed by users in their post regarding 'tesla stock'.

The stack bar which displayed the frequency of user's emotion with only one person expressing fear about the stock. This however, pricked my conscience to view that post in isolation.

**The post on fear:** “3tsl etf. I bought 5000 shares for £13000 at 237p. Today its value dropped to 39p. I'm losing 86% of the value £12050. My question is will I be able to recover my money or soon it will go to £0000. I'm worried since it keeps dropping the value of it.”

# Conclusion Cont'

I decided to investigate from other investment platform to determine whether there was any iota of truth in relation to the fear post about a sharp drop in share value at any point in time to guide my investment decision.

Even though, the general sentiment about the stock was not bad, I decided to obtain a more representative data across other social media site to take an informed decision

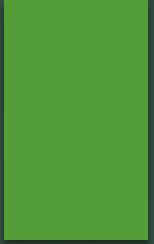
# Challenges

- ▶ Sourcing data from a popular social media website like twitter was very difficult due to resent changes in API calls for developers
- ▶ The data obtained from reddit was not representative enough for me to take an actionable and informed decision in relation to investing in the stock

## ► References:

Tesla impact report, 2022. A sustainable future is within reach. Available online at [tesla.com/ns\\_videos/2022-tesla-impact-report.pdf](https://tesla.com/ns_videos/2022-tesla-impact-report.pdf) [Access on 30<sup>th</sup> January 2021]

Source data: <https://www.reddit.com/r/teslastock/>



End of Presentation