

The impact of Elon Musk's Tweets on Tesla Stock Price

Serrana, Arindam

Introduction



Influential user

400 million active users.
Fast spread of information.
Good population sentiment
predictor.



100+ million Twitter followers.
Tesla CEO.

Owner



Stock prices showed to be
correlated with general public
sentiment.

Introduction, cont'd

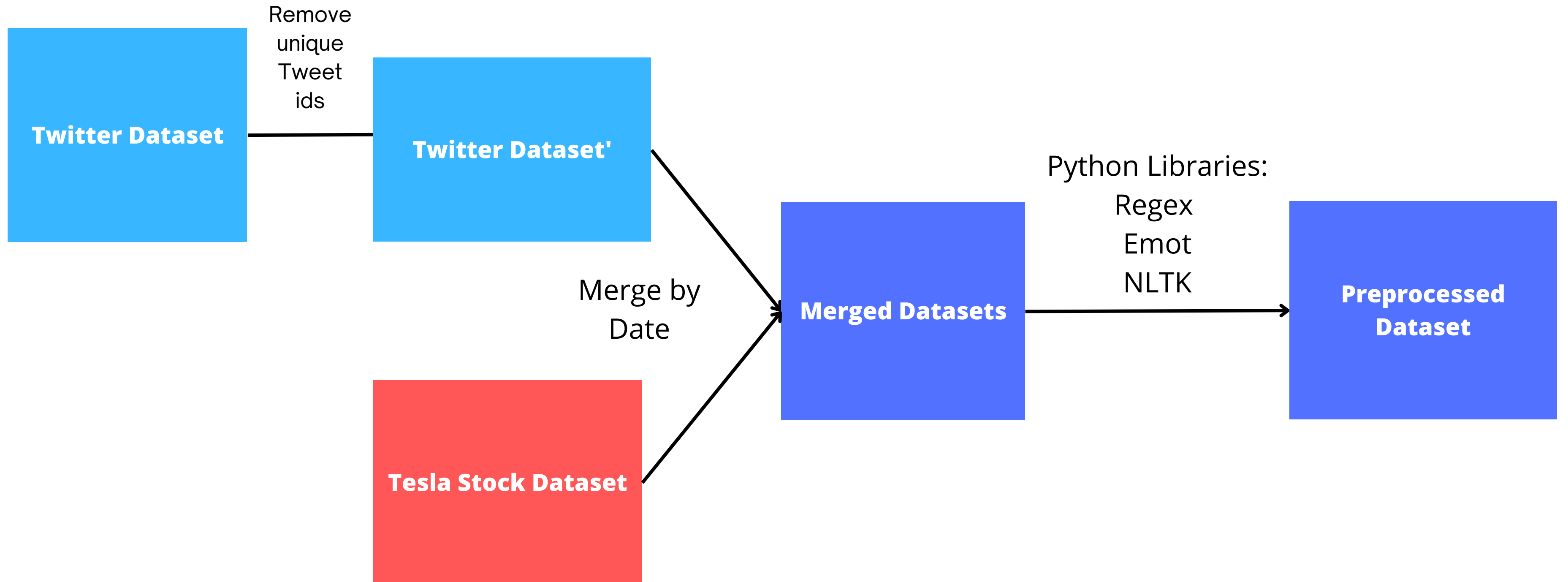
RQ 1: Do Elon Musk's tweets impact Tesla stock price significantly?

H1: Negative professional or personal tweets drive the Tesla stock price down.

RQ 2: Does the impact of a professional tweet differ from the impact of a personal tweet?

H2: Professional tweets have higher impact on Tesla's stock price than personal ones.

Data



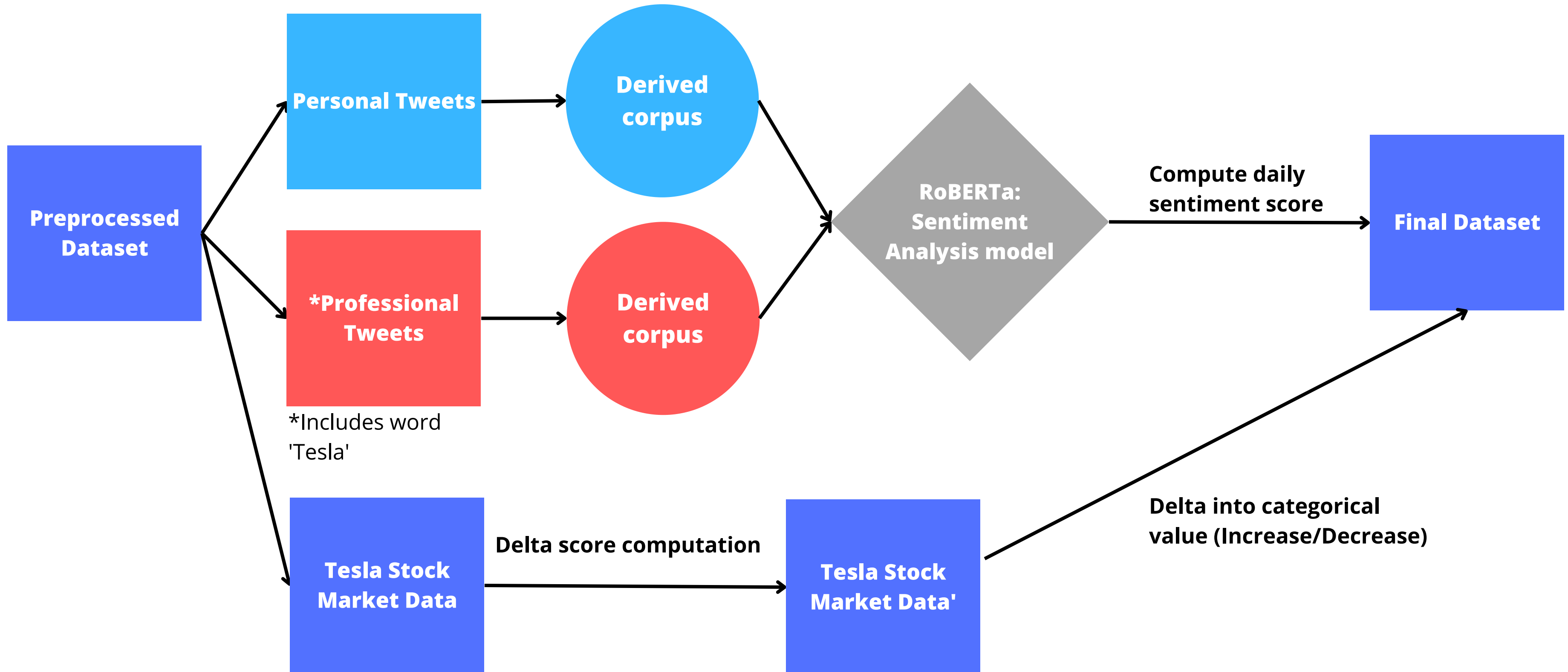
Data, cont'd

date	username	tweet	replies_count	retweets_count	likes_count
2021-11-04	elonmusk	@vincent13031925 For now. Costs are decreasing...	640	444	15281
2021-11-04	elonmusk	Love this beautiful shot	2464	1517	71161
2021-11-04	elonmusk	@agnostoxxx @CathieDWood @ARKInvest Trust the ...	115	48	1380
2021-11-04	elonmusk	The art In Cyberpunk is incredible	8437	10329	228144
2021-11-04	elonmusk	@itsALLrisky 🤔🤔	446	542	7489
2021-11-04	elonmusk	@seinfeldguru @WholeMarsBlog Nope haha	234	65	2536
2021-11-04	elonmusk	@WholeMarsBlog If you don't say anything &...;	222	201	2625
2021-11-04	elonmusk	@DeltavPhotos @PortCanaveral That rocket is a ...	214	296	11956
2021-11-04	elonmusk	Blimps rock https://t.co/e8cu5FkNOI	8811	6661	165302
2021-10-04	elonmusk	@engineers_feed Due to lower gravity, you can ...	1595	1936	48034

- Hashtags conversion to separate column
- Emoji translation
- Usernames removal
- Links removal
- Non-ASCII character removal
- Email address removal
- Punctuation removal
- Stopwords removal
- Special characters removal

date	username	new_tweet	replies_count	retweets_count	likes_count
2021-11-04	elonmusk	now costs decreasing rapidly	640	444	15281
2021-11-04	elonmusk	love beautiful shot	2464	1517	71161
2021-11-04	elonmusk	trust shrub	115	48	1380
2021-11-04	elonmusk	art cyberpunk incredible	8437	10329	228144
2021-11-04	elonmusk		446	542	7489
2021-11-04	elonmusk	nope haha	234	65	2536
2021-11-04	elonmusk	dont say anything amp engage autopilot soon gu...	222	201	2625
2021-11-04	elonmusk	rocket hardcore veteran missions	214	296	11956
2021-11-04	elonmusk	blimps rock	8811	6661	165302
2021-10-04	elonmusk	due lower gravity travel surface mars surface ...	1595	1936	48034

Method



Results and Discussion

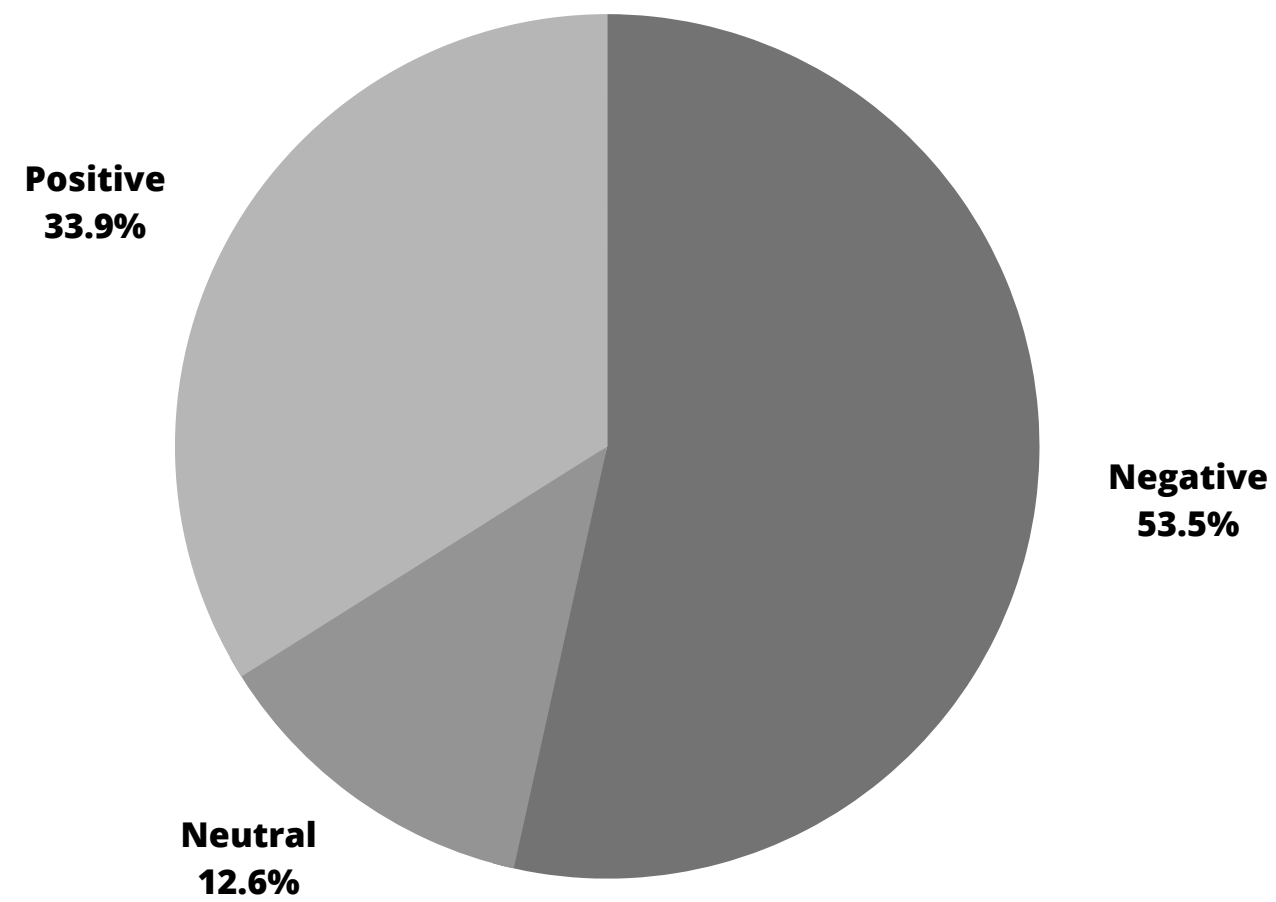
Chi-Square test of Independence

Checking if sentiments are related to increase in stock price

p-value=0.8679

Since, the p-value is greater than 0.05, we accept the null hypothesis. Hence, we can say that the sentiments are independent of the stock price.

Sentiment distribution for Elon's Tweets



Results and Discussion

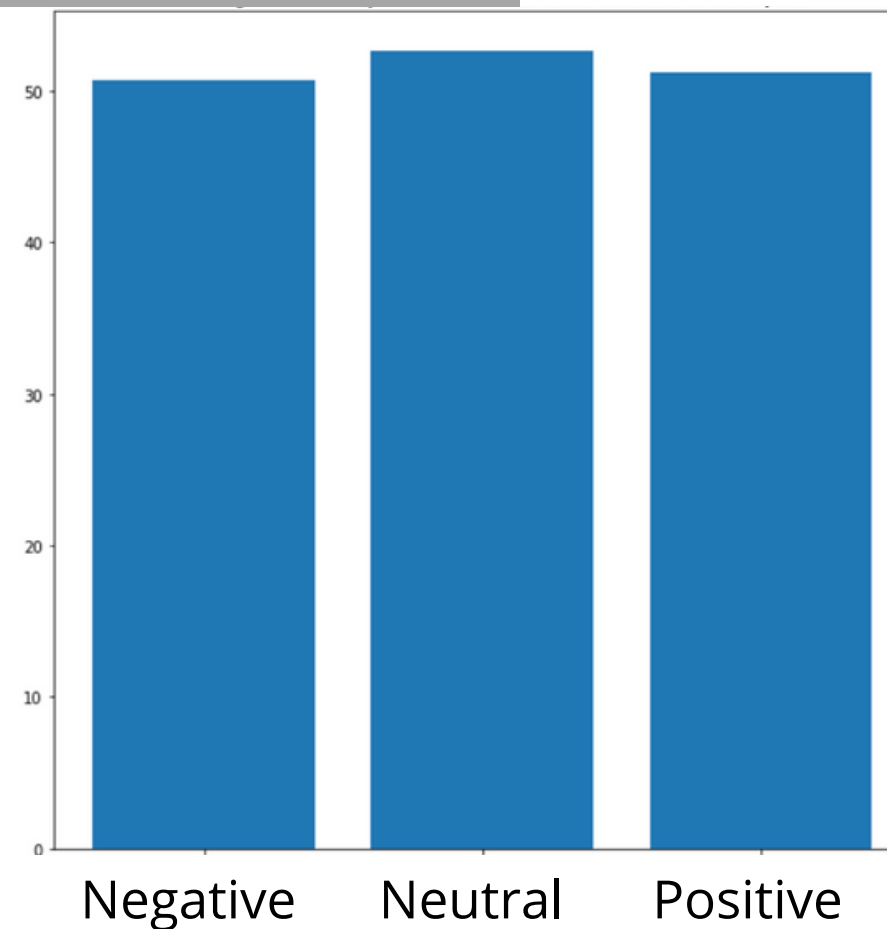
Kruskal Wallis H Test

on sentiment groups and closing price

Non parametric alternative to the One Way ANOVA.

p-value=0.095

Since, the p-value is greater than 0.05, we accept the null hypothesis. Hence, we can say that there is no difference in the impact of different tweets based on emotions.



Percentage of tweets
by sentiment which
led to increase in
stock price

Results and Discussion

Mann Whitney U Test

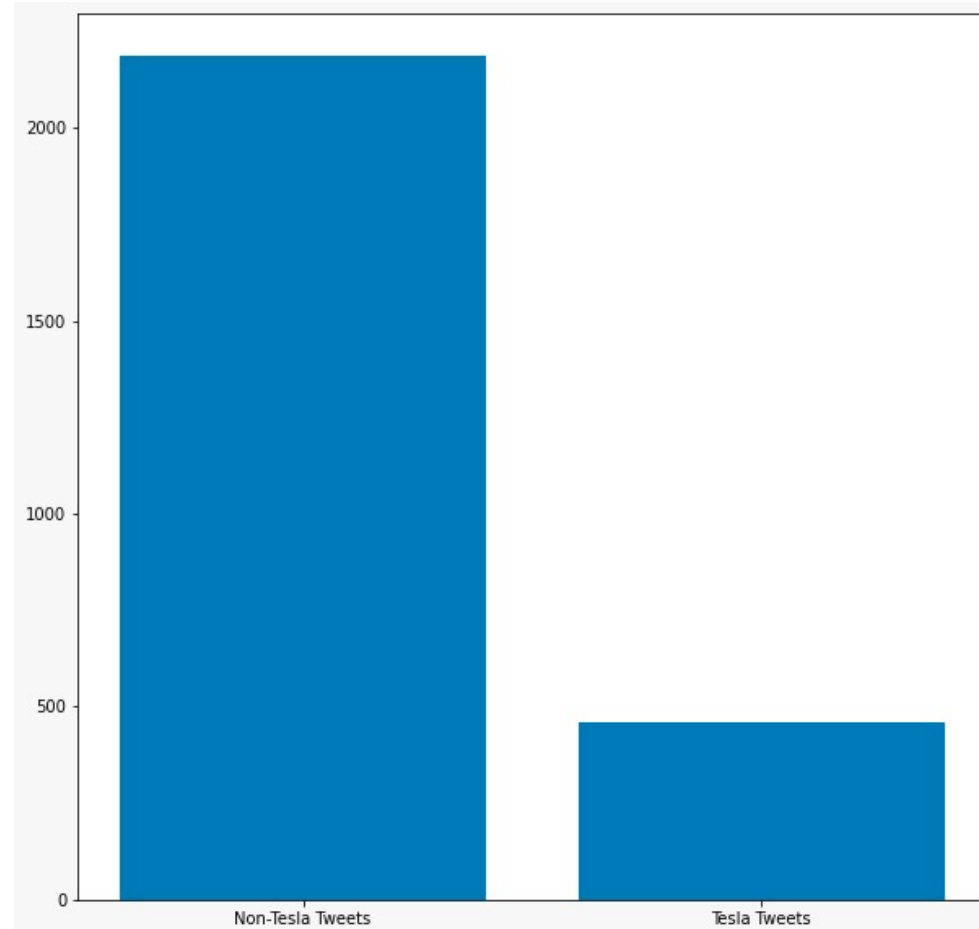
on Tesla/Non-Tesla groups and closing price

Equivalent to Kruskal when there are two groups.

p-value~0.0

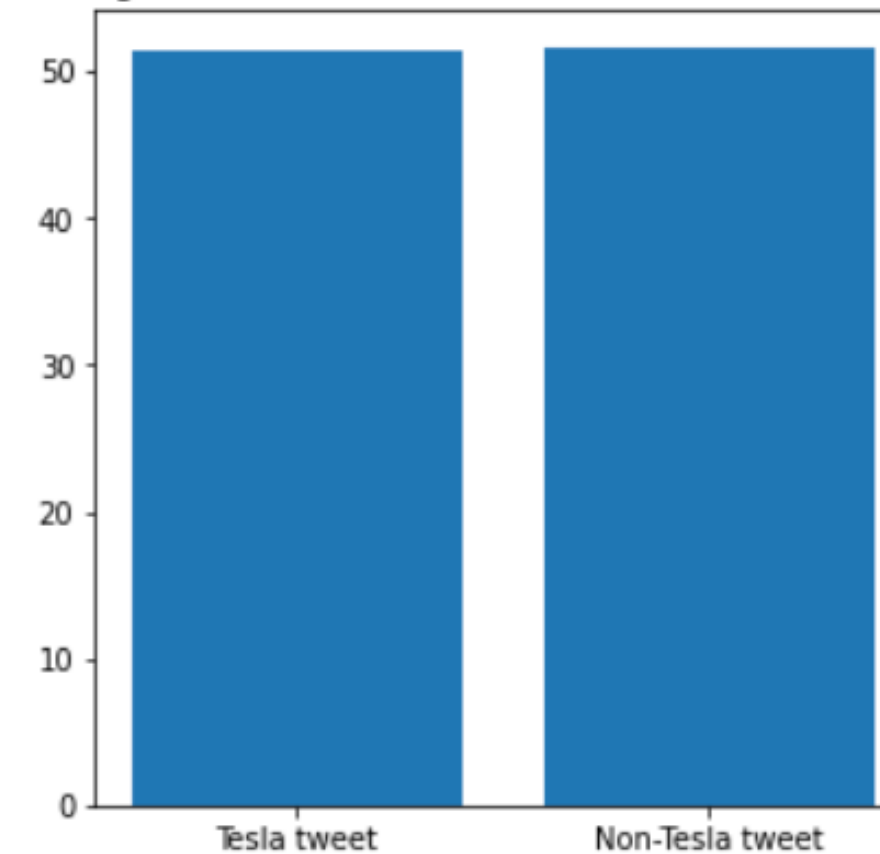
Since the p-value is very close to zero, we can reject the null hypothesis, and we can say that the impact of tesla tweets on the stock price is different from that of non-tesla tweets.

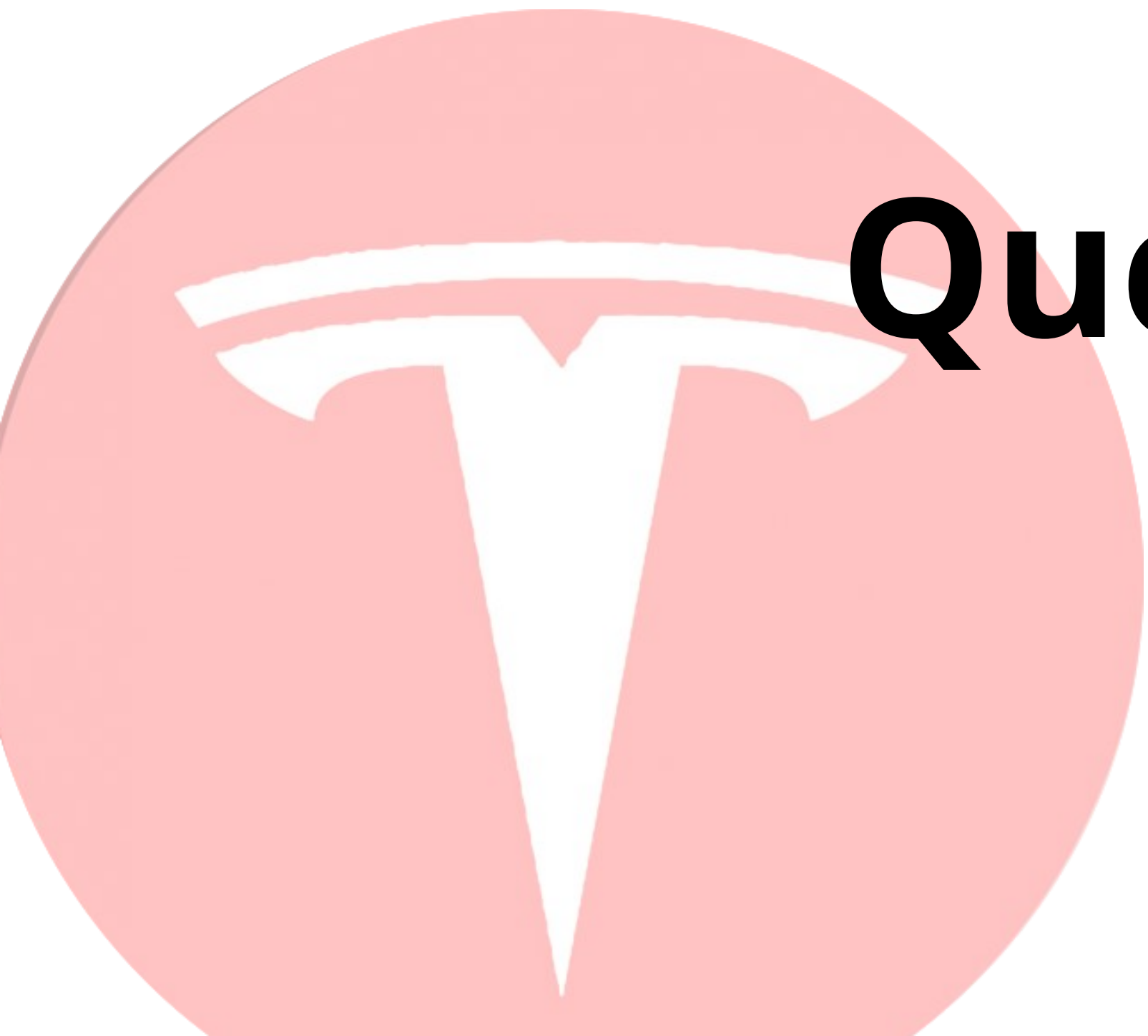
Professional vs
Personal tweets



82.6% of the tweets are personal
17.4% of the tweets are professional

Percentage of Tesla vs Non-Tesla tweets which led to increase





Questions?

