

Stock Prediction using Twitter Sentiment Analysis

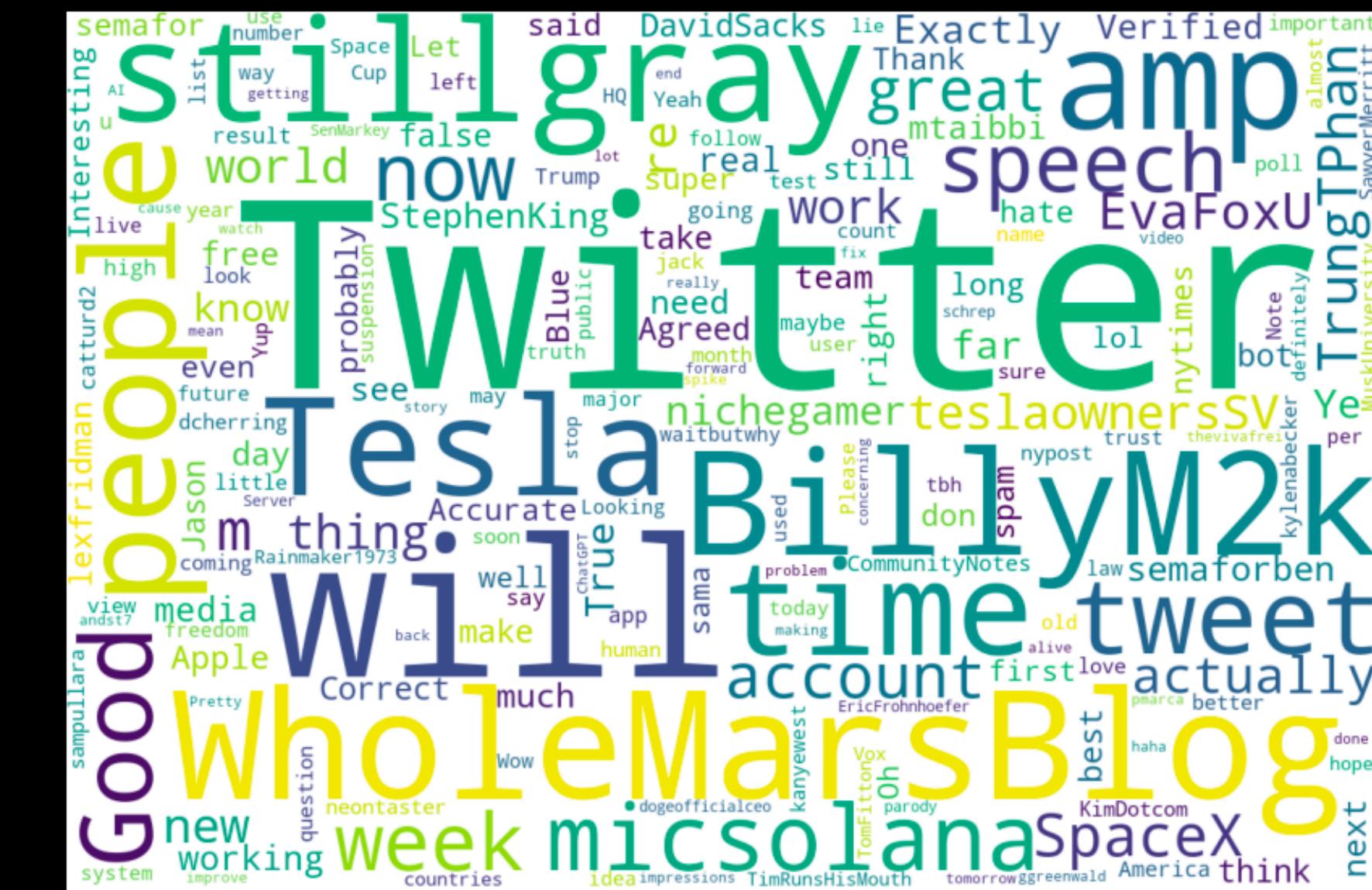
**API, NLP (Sentimental Analysis),
Grander Causality,
Random Forest Model**

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How important is your opinion?

STOCK MARKET FORECASTING

- Different methods and there is a lot of controversy about which one is the best. In the fundamental (Warren Buffet's theory). They affirm that all public known information about a company, which includes **OPINIONS**, would affect the stock price.
 - Social Media platforms: Twitter or Reddit have become a variable to consider.



Data bases & API TWITTER

- Stock Market TESLA (daily open-close):
232 rows (Jan.-Dec 2022)
- Mentions of TESLA on Twitter: 153.000
rows (April - Dec. 2022)
- Mentions of Elon Musk on Twitter (last
week: 06.-13.2022)

The screenshot shows the Twitter Developer Portal interface. At the top, there's a dark header with the Twitter logo and the text "Developer Portal". Below this, a white section is titled "Twitter API v2" with tabs for "Essential", "Elevated" (which is underlined), and "Academic Research".

The main content area is titled "Elevated" and describes it as "Higher levels of access to the Twitter API for free with an approved application". It shows that the project has "Elevated access" for the application "Dumb Stanislas".

On the right side, there are several sections with icons and descriptions:

- "Apps": 3 environments per project
- "Tweets": 2M Tweets per month / Project
- "Cost": free
- "Tweet cap": no
- "Special attributes": -

Below this, there's a table for "Endpoints" with two rows:

Endpoints	Rate limit ⓘ	Tweet cap ⓘ	Special attributes
GET /2/tweets/:id	300 requests / 15 mins PER APP 900 requests / 15 mins PER USER	no	-
GET /2/tweets	300 requests / 15 mins PER APP 900 requests / 15 mins PER USER	no	-

At the bottom, there's a section titled "Use cases" with three images:

- "Build for businesses": An older couple laughing.
- "Build for the public": Two young people looking at a phone.
- "Do research": A person working on a computer screen with a grid overlay.

Sentimental Analysis

NLP: study affective states

Libraries: Text Blow & `from nltk.sentiment.vader import SentimentIntensityAnalyzer`

- **positive** sentiment, **compound** ≥ 0.05
- **negative** sentiment, **compound** ≤ -0.05
- **neutral** sentiment, the **compound** is between $]-0.05, 0.05[$



```
print(rows)
```

```
[{'text': 'The sale comes as shares of the electric vehicle and solar panel maker have collapsed, losing over half their value... https://t.co/Zx33J405Rn', 'date': datetime.datetime(2022, 12, 15, 15, 9, 44, tzinfo=datetime.timezone.utc), 'id': 1603406964037386242, 'location': 'Texas, USA', 'compound': -0.3612}]
```

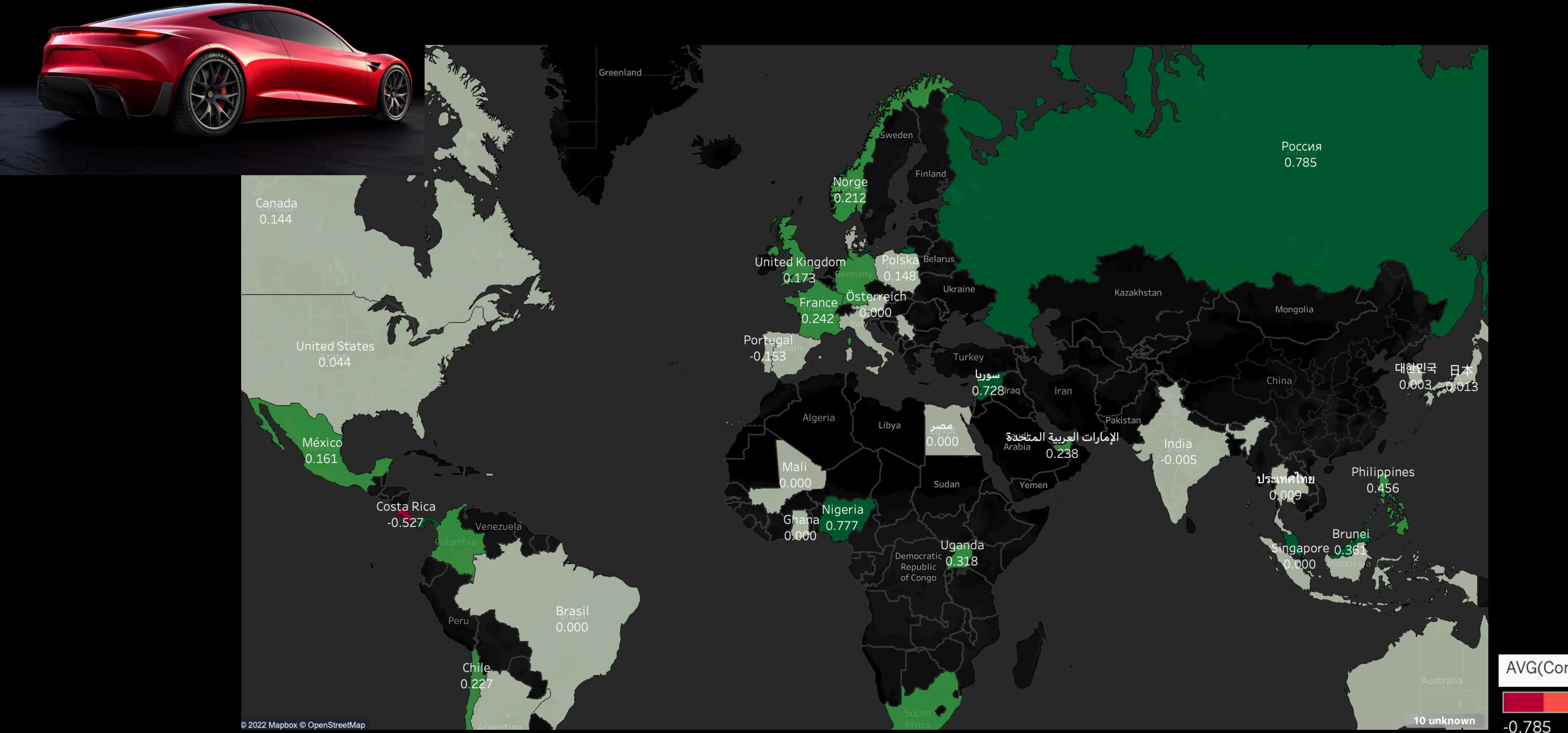


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print(rows)
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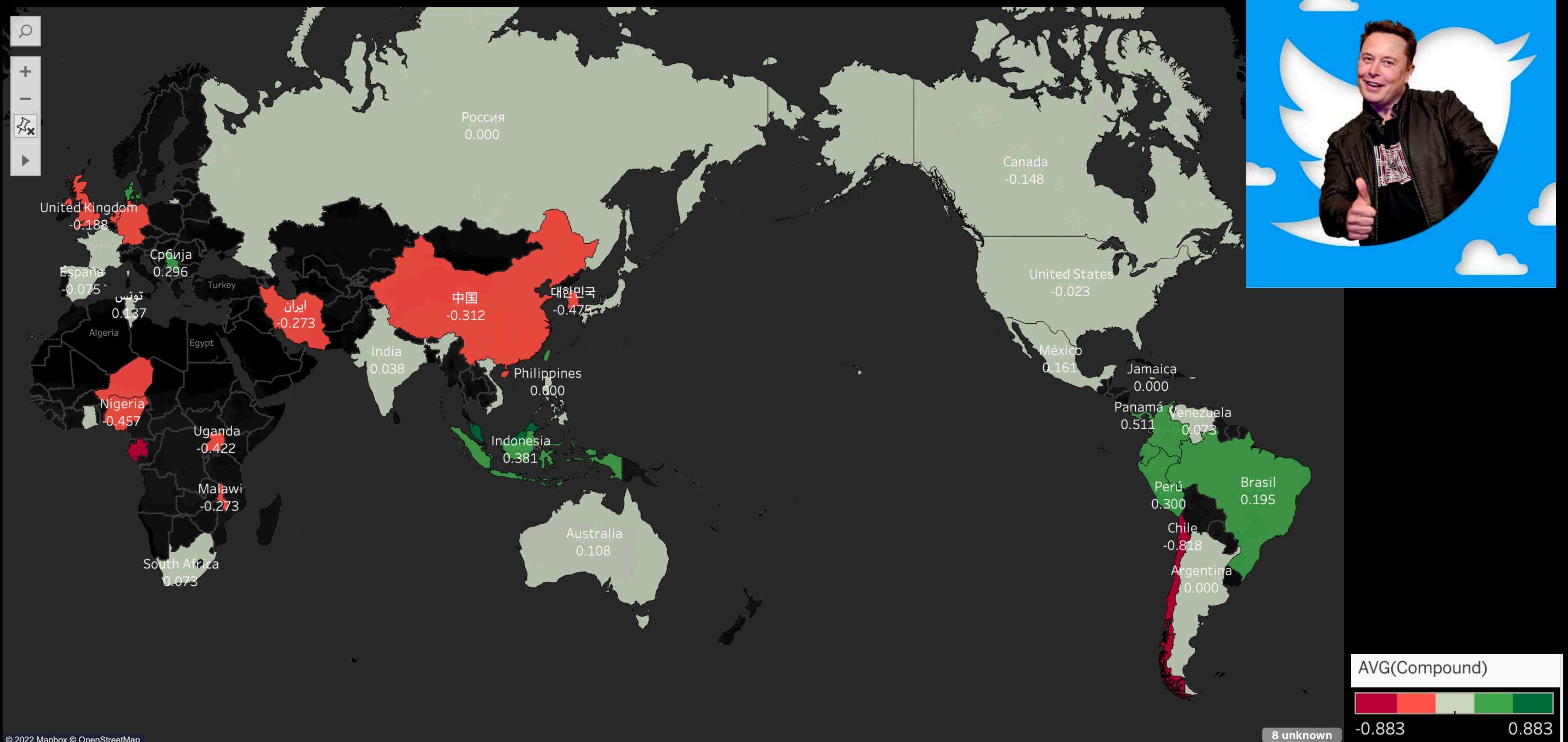
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Multi-Country TESLA opinion on Twitter (last 7 days)



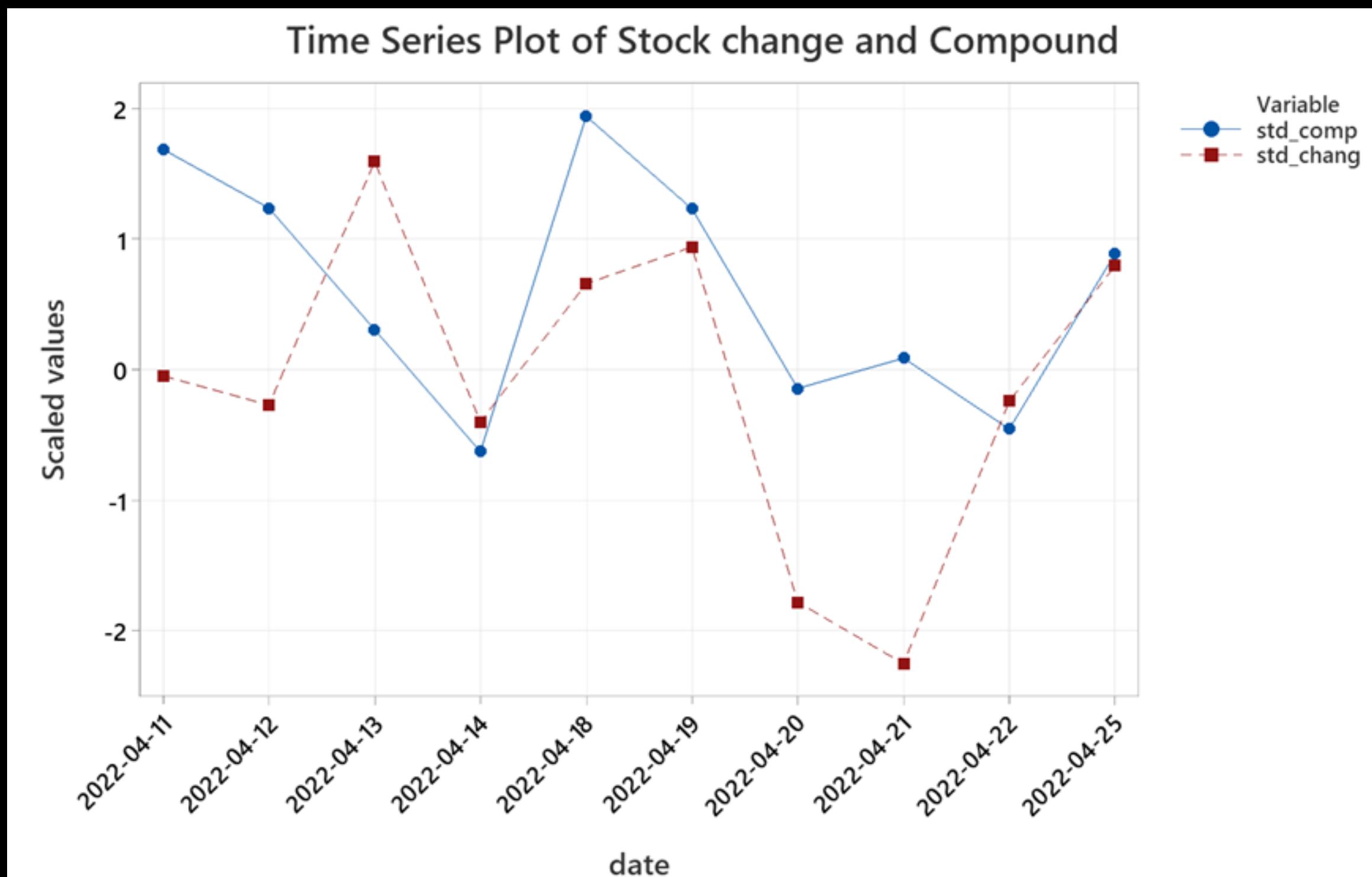
Multi-Country Musk opinion on Twitter (last 7 days)



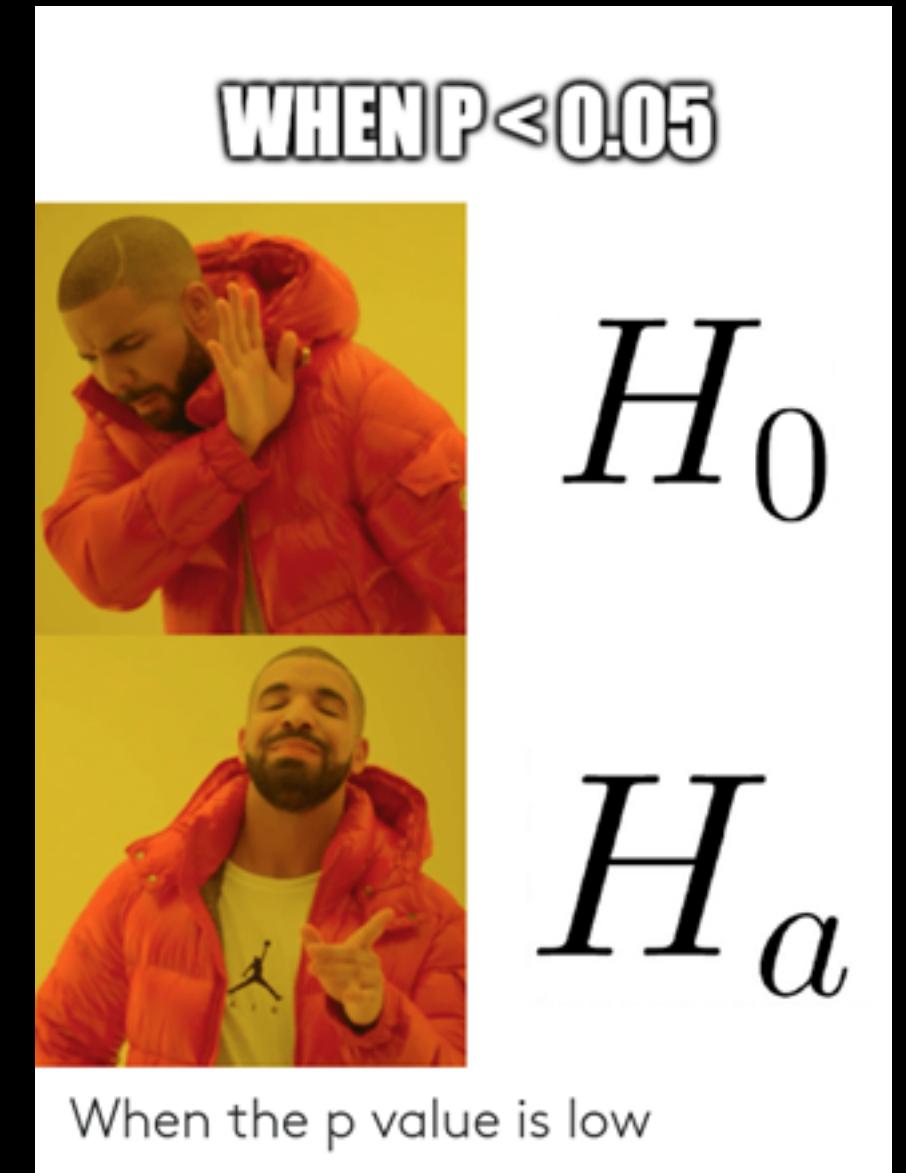
Methodology

Grander Causality Analysis

- Correlate Tesla Stock change to Twitter Tesla mood



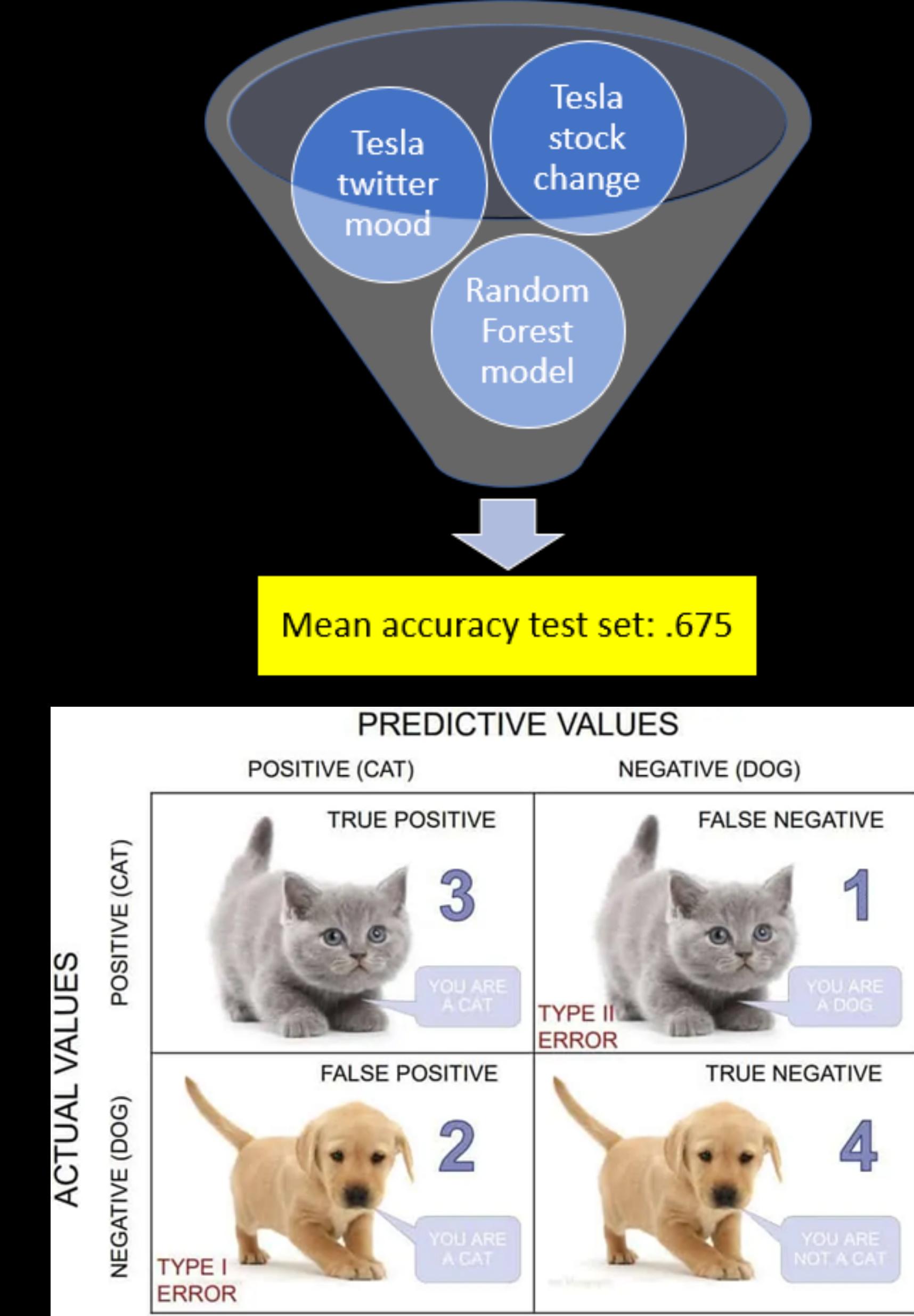
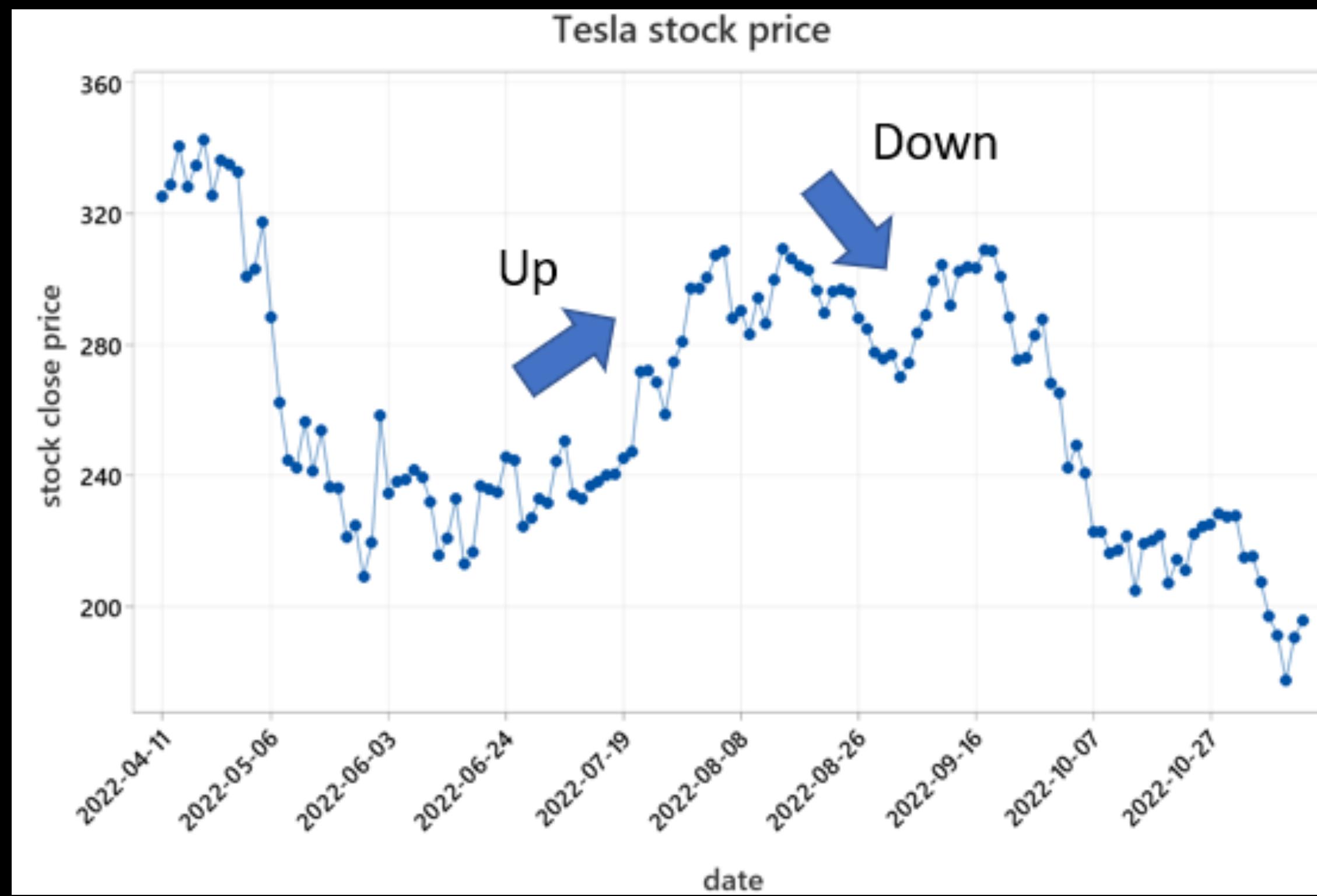
STATISTICAL SIGNIFICANCE (P-VALUES) OF BIVARIATE GRANGER-CAUSALITY CORRELATION BETWEEN MOODS AND TESLA STOCK IN PERIOD APRIL 2022 TO NOVEMBER 2022.



Lag	Compound
1 day	0.5212
2 days	0.806
3 days	0.9414
4 days	0.0312
5 days	0.0413

Classification Model

Random Forest Classifier



According to our model, the Tesla stock price will INCREASE from day 4 of this study

	date	Compound	open	close	change	direction	pred	new
0	2022-12-07	0.128022	175.03	174.04	-0.99	down	NaN	up
1	2022-12-08	0.155608	172.20	173.44	1.24	up	NaN	up
2	2022-12-09	0.029505	173.84	179.05	5.21	up	NaN	down
3	2022-12-10	0.069755	173.84	179.05	5.21	up	NaN	down
4	2022-12-11	0.010891	173.84	179.05	5.21	up	up	down
5	2022-12-12	0.005500	176.10	167.82	-8.28	down	up	down
6	2022-12-13	0.069047	174.87	160.95	-13.92	down	down	down
7	2022-12-14	0.143605	159.25	156.80	-2.45	down	down	up



Your opinion matters

