In [ ]:
```
pip install python_dotenv
```

In [ ]:
```
pip install requests
```

In [ ]:
```
pip install numpy
```

In [ ]:
```
pip install nltk
```

In [ ]:
```
pip install pandas
```

In [ ]:
```
pip install scikit-learn
```

In [ ]:
```
pip install transformers torch
```

In [ ]:
```python
from dotenv import load_dotenv
import os
import requests
import pandas as pd
from pandas import json_normalize
import json
import numpy as np
import nltk
nltk.download('all')
from nltk.sentiment import SentimentIntensityAnalyzer
from tqdm.notebook import tqdm
import re
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.stem import WordNetLemmatizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.model_selection import train_test_split
from transformers import BertTokenizer, BertModel
import torch
from sklearn.cluster import KMeans
from sklearn.decomposition import PCA
```

In [400…
```python
#Load API key and host
load_dotenv(dotenv_path="api.env")

api_key = os.getenv("API_KEY")
api_host = os.getenv("API_HOST")
```

In [32]:
```python
#Get continuation_token based on iteration of the for cycle
def get_continuation_token(i:int, data: dict, continuation_data = None) -> str:
    if i >= 1:
        continuation_token = continuation_data["continuation_token"]
    else:
        continuation_token = data["continuation_token"]

    return continuation_token
```

In [4]:
```python
#Unwrap lists step by step
def flatten_data(data:dict)-> dict:
    while isinstance(data, list) and len(data) > 0:
        data = data[0]
```

```
        return data
```

```python
#Get user tweets
url = "https://twitter154.p.rapidapi.com/user/tweets"
querystring = {"username":"elonmusk",
               "limit":"40",
               "user_id":"44196397",
               "include_replies":"false",
               "include_pinned":"false"}
headers = {"x-rapidapi-key": api_key,
           "x-rapidapi-host": api_host}

response = requests.get(url, headers=headers, params=querystring)

if response.status_code == 200:  # Check if request was successful
    data = response.json()  # Convert response to Python dictionary+
    with open("tweets.json", "w") as json_file:
        # Write the data to the JSON file
        json.dump(data, json_file, indent=4)  # indent=4 for pretty printing

else:
    print(f"Error: {response.status_code}")
```

```python
#Get tweets by twitter ID
num_of_tweets = 2300
tweet_dict_list = []
continuation_token = None

for i in range(num_of_tweets):

    continuation_token = get_continuation_token(i, data, continuation_data)

    url = "https://twitter-v24.p.rapidapi.com/user/tweets"

    querystring = {"user_id":"44196397","limit":"40"}

    headers = {
        "x-rapidapi-key": api_key,
        "x-rapidapi-host": api_host
    }


    if response.status_code == 200:  # Check if request was successful
        continuation_data = response.json()  # Convert response to Python dictio
        tweet_dict_list.append(continuation_data)

        with open("tweets_continue.json", "w") as json_file:
            # Write the data to the JSON file
            json.dump(continuation_data, json_file, indent=4)  # indent=4 for pr
            print("Data has been saved to 'api_response.json'.")
    else:
        print(f"Error: {response.status_code}")
```

```python
#Get user details
url = "https://twitter154.p.rapidapi.com/user/details"
querystring = {"username":"elonmusk", "user_id":"44196397"}
headers = {"x-rapidapi-key": api_key,
           "x-rapidapi-host": api_host}
```

```python
response = requests.get(url, headers = headers, params = querystring)

if response.status_code == 200:  # Check if request was successful
    userData = response.json()  # Convert response to Python dictionary
else:
    print(f"Error: {response.status_code}")
```

In [ ]:
```python
#Get user continuation tweets with continuation token and merge into a single li

num_of_tweets = 300
tweet_dict_list = []
continuation_token = None

for i in range(num_of_tweets):

    continuation_token = get_continuation_token(i, data, continuation_data)

    url = "https://twitter154.p.rapidapi.com/user/tweets/continuation"

    querystring = {"username":"elonmusk",
                   "limit":"20",
                   "continuation_token":continuation_token,
                   "user_id":"44196397",
                   "include_replies":"false"}
    headers = {
            "x-rapidapi-key": api_key,
            "x-rapidapi-host": api_host
        }

    response = requests.get(url, headers=headers, params=querystring)

    if response.status_code == 200:  #Check if request was successful
        continuation_data = response.json()  #Convert response to Python diction
        tweet_dict_list.append(continuation_data)

        with open("tweets_continuation.json", "w") as json_file:
            # Write the data to the JSON file
            json.dump(continuation_data, json_file, indent=4)
            print("Data has been saved to 'tweets_continuation.json'.")
    else:
        print(f"Error: {response.status_code}")
```

In [5]:
```python
tweets_df = pd.DataFrame(data)

print(tweets_df.info())
print(tweets_df.head())
print(tweets_df.dtypes)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 20 entries, 0 to 19
Data columns (total 2 columns):
 #   Column              Non-Null Count  Dtype
---  ------              --------------  -----
 0   results             20 non-null     object
 1   continuation_token  20 non-null     object
dtypes: object(2)
memory usage: 452.0+ bytes
None
                                                results  \
0  {'tweet_id': '1899340251857866790', 'creation_...
1  {'tweet_id': '1899340160350765477', 'creation_...
2  {'tweet_id': '1899339287499272238', 'creation_...
3  {'tweet_id': '1899337145392795803', 'creation_...
4  {'tweet_id': '1899334891008835806', 'creation_...

                         continuation_token
0  DAABCgABGlv34Cp__-gKAAIaW7zte9aQoQgAAwAAAAIAAA
1  DAABCgABGlv34Cp__-gKAAIaW7zte9aQoQgAAwAAAAIAAA
2  DAABCgABGlv34Cp__-gKAAIaW7zte9aQoQgAAwAAAAIAAA
3  DAABCgABGlv34Cp__-gKAAIaW7zte9aQoQgAAwAAAAIAAA
4  DAABCgABGlv34Cp__-gKAAIaW7zte9aQoQgAAwAAAAIAAA
results             object
continuation_token  object
dtype: object
```

As we can see from the results of the cell above the dataframe has two columns which points that the json file was highly nested that also is supported by dtypes which shows type objects. If dtype is objects while dhaving distionaries the json is therefore nested. We just need to flatten out the results column.

In [ ]:
```
#Pretty print
print(json.dumps(data, indent = 4))
```

In [38]:
```
tweets_df = pd.json_normalize(data, record_path = "results")

print(tweets_df)
```

```
           tweet_id                    creation_date  \
0    1899400056412705214  Tue Mar 11 10:00:37 +0000 2025
1    1899395698375713064  Tue Mar 11 09:43:18 +0000 2025
2    1899395211937140828  Tue Mar 11 09:41:22 +0000 2025
3    1899395112603451622  Tue Mar 11 09:40:58 +0000 2025
4    1899394826405031986  Tue Mar 11 09:39:50 +0000 2025
5    1899392754783850951  Tue Mar 11 09:31:36 +0000 2025
6    1899389785514344531  Tue Mar 11 09:19:48 +0000 2025
7    1899389361977770075  Tue Mar 11 09:18:07 +0000 2025
8    1899340251857866790  Tue Mar 11 06:02:58 +0000 2025
9    1899340160350765477  Tue Mar 11 06:02:36 +0000 2025
10   1899339287499272238  Tue Mar 11 05:59:08 +0000 2025
11   1899337145392795803  Tue Mar 11 05:50:38 +0000 2025
12   1899334891008835806  Tue Mar 11 05:41:40 +0000 2025
13   1899334767394341183  Tue Mar 11 05:41:11 +0000 2025
14   1899334595276931118  Tue Mar 11 05:40:30 +0000 2025
15   1899334109119304162  Tue Mar 11 05:38:34 +0000 2025
16   1899332004233031742  Tue Mar 11 05:30:12 +0000 2025
17   1899323460909707637  Tue Mar 11 04:56:15 +0000 2025
18   1899323043400294577  Tue Mar 11 04:54:35 +0000 2025
19   1899322833810891127  Tue Mar 11 04:53:45 +0000 2025

                                                  text  \
0    RT @DirtyTesLa: 1 year ago today @WifeDirtyTes...
1    RT @EndWokeness: National debt, 1960: $286 bil...
2                                                 Yeah
3    RT @MarioNawfal: ELON: DOGE IS 100% TRANSPAREN...
4    What fixing government computer systems feels ...
5                                               Bravo!
6    RT @MikeBenzCyber: So many ironies here showin...
7                                                 True
8    RT @cybertruck: The only pickup truck with FSD...
9              Extremely fundamental to your freedom
10   RT @matt_vanswol: I'm angry this morning.\n\nI...
11   RT @Sadie_NC: I think it speaks volumes that y...
12                                                🔥🔥
13   RT @Scobleizer: Tesla is in a free fall. \n\nI...
14   Much appreciated @SeanHannity!\n https://t.co/...
15   RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...
16                                                  😳
17   RT @RapidResponse47: .@VP: The U.S. unfortunat...
18   RT @GigaBasedDad: Are you paying attention yet...
19   RT @WallStreetApes: Elon Musk explains the NGO...

                                             media_url  \
0                                                 None
1                                                 None
2                                                 None
3                                                 None
4    [https://pbs.twimg.com/media/GlwBh2TXQAETrYr.jpg]
5                                                 None
6                                                 None
7                                                 None
8                                                 None
9                                                 None
10                                                None
11                                                None
12                                                None
13                                                None
14                                                None
```

```
15                                                 None
16                                                 None
17                                                 None
18   [https://pbs.twimg.com/media/GlFcQmLW8AATrWk.jpg]
19                                                 None

                                         video_url language  \
0                                             None       en
1                                             None       en
2                                             None       en
3                                             None       en
4                                             None       en
5                                             None       pt
6                                             None       en
7                                             None       en
8                                             None       en
9                                             None       en
10                                            None       en
11                                            None       en
12                                            None      art
13                                            None       en
14   [{'url': 'https://video.twimg.com/ext_tw_video...      en
15                                            None       en
16                                            None      art
17                                            None       en
18                                            None       en
19                                            None       en

     favorite_count  retweet_count  reply_count  quote_count  ...  \
0                 0            312            0            0   ...
1                 0           1990            0            0   ...
2              4756            551          817           22   ...
3                 0            728            0            0   ...
4             36142           3510         3051          334   ...
5              6483            728          651           14   ...
6                 0            770            0            0   ...
7              6815            769          846           36   ...
8                 0            726            0            0   ...
9             16273           3952         2581          108   ...
10                0           2772            0            0   ...
11                0           1278            0            0   ...
12            22400           2536         1279           44   ...
13                0            586            0            0   ...
14            32902           4084         1839          161   ...
15                0           1602            0            0   ...
16            14238           3537         1726           83   ...
17                0           1851            0            0   ...
18                0           1096            0            0   ...
19                0           1977            0            0   ...

     retweet_status.quoted_status.retweet_tweet_id  \
0                                              NaN
1                                              NaN
2                                              NaN
3                                              NaN
4                                              NaN
5                                              NaN
6                                              NaN
7                                              NaN
8                                              NaN
```

```
9                                    NaN
10                                   NaN
11                                   NaN
12                                   NaN
13                                   NaN
14                                   NaN
15                                   NaN
16                                   NaN
17                                   NaN
18                                   NaN
19                                   NaN
```

```
    retweet_status.quoted_status.extended_entities.media  \
0                                               NaN
1                                               NaN
2                                               NaN
3                                               NaN
4                                               NaN
5                                               NaN
6   [{'additional_media_info': {'monetizable': Fal...
7                                               NaN
8   [{'display_url': 'pic.x.com/XOlSOelDG8', 'expa...
9                                               NaN
10                                              NaN
11                                              NaN
12                                              NaN
13                                              NaN
14                                              NaN
15                                              NaN
16                                              NaN
17                                              NaN
18                                              NaN
19                                              NaN
```

```
    retweet_status.quoted_status.conversation_id  \
0                                    NaN
1                                    NaN
2                                    NaN
3                                    NaN
4                                    NaN
5                                    NaN
6                    1899044395090837844
7                                    NaN
8                    1898965812679155891
9                                    NaN
10                                   NaN
11                                   NaN
12                                   NaN
13                                   NaN
14                                   NaN
15                   1899319396037726369
16                                   NaN
17                                   NaN
18                                   NaN
19                                   NaN
```

```
   retweet_status.quoted_status.retweet_status  \
0                                    NaN
1                                    NaN
2                                    NaN
```

Second

3	NaN
4	NaN
5	NaN
6	NaN
7	NaN
8	NaN
9	NaN
10	NaN
11	NaN
12	NaN
13	NaN
14	NaN
15	NaN
16	NaN
17	NaN
18	NaN
19	NaN

	retweet_status.quoted_status.quoted_status \
0	NaN
1	NaN
2	NaN
3	NaN
4	NaN
5	NaN
6	NaN
7	NaN
8	NaN
9	NaN
10	NaN
11	NaN
12	NaN
13	NaN
14	NaN
15	NaN
16	NaN
17	NaN
18	NaN
19	NaN

	retweet_status.quoted_status.bookmark_count \
0	NaN
1	NaN
2	NaN
3	NaN
4	NaN
5	NaN
6	3754.0
7	NaN
8	19.0
9	NaN
10	NaN
11	NaN
12	NaN
13	NaN
14	NaN
15	286.0
16	NaN
17	NaN
18	NaN

```
19                                                 NaN

    retweet_status.quoted_status.source  \
0                                      NaN
1                                      NaN
2                                      NaN
3                                      NaN
4                                      NaN
5                                      NaN
6                                      NaN
7                                      NaN
8                                      NaN
9                                      NaN
10                                     NaN
11                                     NaN
12                                     NaN
13                                     NaN
14                                     NaN
15                                     NaN
16                                     NaN
17                                     NaN
18                                     NaN
19                                     NaN

    retweet_status.quoted_status.community_note  \
0                                             NaN
1                                             NaN
2                                             NaN
3                                             NaN
4                                             NaN
5                                             NaN
6                                             NaN
7                                             NaN
8                                             NaN
9                                             NaN
10                                            NaN
11                                            NaN
12                                            NaN
13                                            NaN
14                                            NaN
15                                            NaN
16                                            NaN
17                                            NaN
18                                            NaN
19                                            NaN

              quoted_status.extended_entities.media  \
0                                               NaN
1                                               NaN
2                                               NaN
3                                               NaN
4                                               NaN
5                                               NaN
6                                               NaN
7                                               NaN
8                                               NaN
9   [{'additional_media_info': {'monetizable': Fal...
10                                              NaN
11                                              NaN
12                                              NaN
```

```
13                                                 NaN
14                                                 NaN
15                                                 NaN
16  [{'display_url': 'pic.x.com/IrQhCjVzOw', 'expa...
17                                                 NaN
18                                                 NaN
19                                                 NaN


    retweet_status.quoted_status.extended_entities
0                                               NaN
1                                               NaN
2                                               NaN
3                                               NaN
4                                               NaN
5                                               NaN
6                                               NaN
7                                               NaN
8                                               NaN
9                                               NaN
10                                              NaN
11                                              NaN
12                                              NaN
13                                              NaN
14                                              NaN
15                                              NaN
16                                              NaN
17                                              NaN
18                                              NaN
19                                              NaN

[20 rows x 204 columns]
```

Just some basic manipulation with df and dict to describe the data I got from API. Basic info, shape and so on.

```
In [39]:  print(tweets_df.info())
          print(tweets_df.dtypes)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 20 entries, 0 to 19
Columns: 204 entries, tweet_id to retweet_status.quoted_status.extended_entities
dtypes: bool(8), float64(75), int64(12), object(109)
memory usage: 30.9+ KB
None
tweet_id                                           object
creation_date                                      object
text                                               object
media_url                                          object
video_url                                          object
                                                   ...
retweet_status.quoted_status.bookmark_count        float64
retweet_status.quoted_status.source                float64
retweet_status.quoted_status.community_note        float64
quoted_status.extended_entities.media               object
retweet_status.quoted_status.extended_entities     float64
Length: 204, dtype: object
```

```
In [40]:  #Creating new df with only the text
          tweets_text_df = tweets_df["text"]
```

```
tweets_text_df
```

Out[40]:
```
0      RT @DirtyTesLa: 1 year ago today @WifeDirtyTes...
1      RT @EndWokeness: National debt, 1960: $286 bil...
2                                                   Yeah
3      RT @MarioNawfal: ELON: DOGE IS 100% TRANSPAREN...
4      What fixing government computer systems feels ...
5                                                 Bravo!
6      RT @MikeBenzCyber: So many ironies here showin...
7                                                   True
8      RT @cybertruck: The only pickup truck with FSD...
9                  Extremely fundamental to your freedom
10     RT @matt_vanswol: I'm angry this morning.\n\nI...
11     RT @Sadie_NC: I think it speaks volumes that y...
12                                                  🔥 🔥
13     RT @Scobleizer: Tesla is in a free fall. \n\nI...
14     Much appreciated @SeanHannity!\n https://t.co/...
15     RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...
16                                                    😳
17     RT @RapidResponse47: .@VP: The U.S. unfortunat...
18     RT @GigaBasedDad: Are you paying attention yet...
19     RT @WallStreetApes: Elon Musk explains the NGO...
Name: text, dtype: object
```

In [41]:
```
tweets_df["text"][5]
```

Out[41]:
```
'Bravo!'
```

In [42]:
```
tweets_df.shape
```

Out[42]:
```
(20, 204)
```

In [43]:
```
tweets_df.isnull().sum()
```

Out[43]:
```
tweet_id                                             0
creation_date                                        0
text                                                 0
media_url                                           18
video_url                                           19
                                                    ..
retweet_status.quoted_status.bookmark_count         17
retweet_status.quoted_status.source                 20
retweet_status.quoted_status.community_note         20
quoted_status.extended_entities.media               18
retweet_status.quoted_status.extended_entities      20
Length: 204, dtype: int64
```

The same will be done for continuation of tweets of the user

In [ ]:
```
tweet_dict_list
```

In [45]:
```
tweets_continuation = pd.json_normalize(tweet_dict_list, record_path="results")
tweets_continuation = pd.DataFrame(tweets_continuation)
tweets_continuation["text"]
```

```
Out[45]:    0                                                Yes
            1       RT @Starlink: Starlink Mini enables high-speed...
            2                              https://t.co/wvHJxQDeCp
            3       RT @teslaownersSV: SpaceX is making fully rapi...
            4       RT @iam_smx: Elon Musk and his, Son Lil X are ...
                                            ...
            826     A more accurate measure of GDP would exclude g...
            827                            https://t.co/3GFeERSg4P
            828     RT @WR4NYGov: When my cousin called Elon an "e...
            829     RT @MatchasmMatt: Probably nothing... https://...
            830                                              True
            Name: text, Length: 831, dtype: object
```

In [46]:
```python
tweets_continuation.shape
```

Out[46]:   (831, 234)

In [47]:
```python
tweets_continuation["text"]
```

Out[47]:   0   Yes
            1   RT @Starlink: Starlink Mini enables high-speed...
            2   https://t.co/wvHJxQDeCp
            3   RT @teslaownersSV: SpaceX is making fully rapi...
            4   RT @iam_smx: Elon Musk and his, Son Lil X are ...
                                            ...
            826   A more accurate measure of GDP would exclude g...
            827   https://t.co/3GFeERSg4P
            828   RT @WR4NYGov: When my cousin called Elon an "e...
            829   RT @MatchasmMatt: Probably nothing... https://...
            830   True
            Name: text, Length: 831, dtype: object

In [48]:
```python
tweets_continuation["text"][22]
```

Out[48]:   'True'

In [49]:
```python
#Creating new df with only the text
tweets_continuation_text = tweets_continuation["text"]
tweets_continuation_text
```

Out[49]:   0   Yes
            1   RT @Starlink: Starlink Mini enables high-speed...
            2   https://t.co/wvHJxQDeCp
            3   RT @teslaownersSV: SpaceX is making fully rapi...
            4   RT @iam_smx: Elon Musk and his, Son Lil X are ...
                                            ...
            826   A more accurate measure of GDP would exclude g...
            827   https://t.co/3GFeERSg4P
            828   RT @WR4NYGov: When my cousin called Elon an "e...
            829   RT @MatchasmMatt: Probably nothing... https://...
            830   True
            Name: text, Length: 831, dtype: object

In [51]:
```python
dataframes = [tweets_continuation_text, tweets_text_df]
tweets_text_merged = pd.concat(dataframes)
tweets_text_merged.shape
```

Out[51]:   (851,)

```
In [52]:  with open('data.json', 'w', encoding='utf-8') as f:
              json.dump(data, f, ensure_ascii=False, indent=4)
```

Now that the tweets are in datagrame and there is enough data we can go ahead with sentiment analysis. First thing first is the data loading which is done and now the next step is data preprocessing for the analysis. Two models will be done acompared which is NLTK and Transformer based such as BERT.

```
In [176…  sentiment_analysis_tweets = tweets_text_merged
          sentiment_analysis_tweets.describe()
```

```
Out[176…  count     851
          unique    757
          top       Yes
          freq       15
          Name: text, dtype: object
```

```
In [54]:  isinstance(sentiment_analysis_tweets, pd.DataFrame)
```

```
Out[54]:  False
```

```
In [55]:  print(type(sentiment_analysis_tweets))
```

```
<class 'pandas.core.series.Series'>
```

```
In [56]:  #change from series to dataframe
          sentiment_analysis_tweets_df = sentiment_analysis_tweets.to_frame()
          print(type(sentiment_analysis_tweets_df))
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
In [57]:  sentiment_analysis_tweets_df
```

Out[57]:

	text
0	Yes
1	RT @Starlink: Starlink Mini enables high-speed…
2	https://t.co/wvHJxQDeCp
3	RT @teslaownersSV: SpaceX is making fully rapi…
4	RT @iam_smx: Elon Musk and his, Son Lil X are …
…	…
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE…
16	🙄
17	RT @RapidResponse47: .@VP: The U.S. unfortunat…
18	RT @GigaBasedDad: Are you paying attention yet…
19	RT @WallStreetApes: Elon Musk explains the NGO…

851 rows × 1 columns

Preprocessing the text by changing it to lower case then getting rid of any characters on empty spaces also htttp. This will get rid of any noise in the data so that it will not affect modeling.

In [66]:
```python
#Preprocessing the dataframe
def text_preprocessing(df:pd.DataFrame) -> pd.DataFrame:
    #Turn it all to lowercase
    df["text_cleaned"] = df["text"].str.lower()

    #Removing hashtags, URLs and mentions win anononymous function of lambda x a
    df["text_cleaned"] = df["text_cleaned"].apply(lambda x: re.sub(r"@\w+|#\w+|h

    #Remove special characters punctuation, numbers and special characters
    df["text_cleaned"] = df["text_cleaned"].apply(lambda x: re.sub(r"[^a-zA-Z\s]

    #Removing 'rt ' from the beginning of the tweet
    df["text_cleaned"] = df["text_cleaned"].apply(lambda x: x[3:] if x.startswit

    return df
```

In [180...
```python
sentiment_analysis_df = text_preprocessing(sentiment_analysis_tweets_df)
```

In [182...
```python
sentiment_analysis_df
```

Out[182...

	text	text_cleaned
0	Yes	yes
1	RT @Starlink: Starlink Mini enables high-speed…	starlink mini enables high speed internet o…
2	https://t.co/wvHJxQDeCp	
3	RT @teslaownersSV: SpaceX is making fully rapi…	spacex is making fully rapidly reusable roc…
4	RT @iam_smx: Elon Musk and his, Son Lil X are …	elon musk and his son lil x are inseparabl…
…	…	…
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE…	cnn anchor left speechless as majority…
16	😳	
17	RT @RapidResponse47: .@VP: The U.S. unfortunat…	the u s unfortunately made it way too …
18	RT @GigaBasedDad: Are you paying attention yet…	are you paying attention yet
19	RT @WallStreetApes: Elon Musk explains the NGO…	elon musk explains the ngo scam\n\n the gov…

851 rows × 2 columns

According to Smith et al. (2020), sentiment analysis is highly dependent on the preprocessing techniques used to prepare the text. But there is an issue with Tweets from

X. With how short they are and how mich or little info can be passed with a text of 280 characters. Based on paper by Saif et al.(2014) found that classical stop word corpuses haas negative impact on classification performance therefore I have decided to use self generated list of stopwords and one with TF-IDF method which has rpoved to work the best in a given paper.

```python
In [178...
#Removing self generated stop words
def remove_stop_words(df: pd.DataFrame, own_stop_words = None, self_managed=Fals

    if (self_managed==True):
        word_set = set(own_stop_words["word"])
        stop_words = word_set
    else:
        #stop_words = set(stopwords.words("english"))
        #Self generatzed stop word list
        stop_words = set(["a", "an", "the", "is", "are", "was", "were", "be", "b
                          "I", "you", "he", "she", "it", "we", "they", "and", "but
                          "so", "to", "of", "in", "on", "for", "with", "at", "by",
                          "this", "that", "these", "those", "which", "who", "whose
                          "when", "why", "too", "also", "just", "really", "quite"]

    # Process each row in the dataframe
    def process_row(text: str) -> str:
        if isinstance(text, str):
            words = word_tokenize(text)

            filtered_words = [w for w in words if w.lower() not in stop_words]

            # Return joined words back as a string
            return ' '.join(filtered_words)
        return ""  # Return an empty string if the text is not valid


    df['text_cleaned'] = df['text_cleaned'].apply(process_row)

    return df
```

```python
In [183...
sentiment_analysis_df = remove_stop_words(sentiment_analysis_df)
sentiment_analysis_df
```

Out[183…

	text	text_cleaned
0	Yes	yes
1	RT @Starlink: Starlink Mini enables high-speed…	starlink mini enables high speed internet go
2	https://t.co/wvHJxQDeCp	
3	RT @teslaownersSV: SpaceX is making fully rapi…	spacex making fully rapidly reusable rockets h…
4	RT @iam_smx: Elon Musk and his, Son Lil X are …	elon musk his son lil x inseparable hi
…	…	…
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE…	cnn anchor left speechless majority americans …
16	🤓	
17	RT @RapidResponse47: .@VP: The U.S. unfortunat…	u s unfortunately made way easy people compete…
18	RT @GigaBasedDad: Are you paying attention yet…	paying attention yet
19	RT @WallStreetApes: Elon Musk explains the NGO…	elon musk explains ngo scam government funded …

851 rows × 2 columns

Here we can see that after preprocessing the text there is 130 rows which are empty and we can get rid of them.

In [184…

```python
sentiment_analysis_df = sentiment_analysis_df.dropna(subset=["text_cleaned"])
sentiment_analysis_df[sentiment_analysis_df["text_cleaned"] == ""]
```

Out[184…

	text	text_cleaned
2	https://t.co/wvHJxQDeCp	
5	😎	
6	🎯	
12	https://t.co/5p19OMVNZR	
14	https://t.co/lKsEQWk4Ed	
...	...	...
822	💯	
823	https://t.co/cehFZIXtvI	
827	https://t.co/3GFeERSg4P	
12	🔥 🔥	
16	😳	

130 rows × 2 columns

In [185…

```
sentiment_analysis_df = sentiment_analysis_df[sentiment_analysis_df["text_cleane
sentiment_analysis_df
```

Out[185...

	text	text_cleaned
0	Yes	yes
1	RT @Starlink: Starlink Mini enables high-speed...	starlink mini enables high speed internet go
3	RT @teslaownersSV: SpaceX is making fully rapi...	spacex making fully rapidly reusable rockets h...
4	RT @iam_smx: Elon Musk and his, Son Lil X are ...	elon musk his son lil x inseparable hi
7	Actual public support for @DOGE is super high!	actual public support super high
...	...	...
14	Much appreciated @SeanHannity!\n https://t.co/...	much appreciated
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...	cnn anchor left speechless majority americans ...
17	RT @RapidResponse47: .@VP: The U.S. unfortunat...	u s unfortunately made way easy people compete...
18	RT @GigaBasedDad: Are you paying attention yet...	paying attention yet
19	RT @WallStreetApes: Elon Musk explains the NGO...	elon musk explains ngo scam government funded ...

721 rows × 2 columns

TF-IDF also known as Term Frequency-Inverse Document Frequency is a measure in statistitcs that is used in natural language programming to show/evaluate importance of a word in the document relative to a collection of documents.

TF - Measures how often a word appears in a document. If a word appears frequently in a document, it is likely relevant to the document's content

IDF - Reduces the weight of common words across multiple documents while increasing the weight of rare words. If a term appears in fewer documents, it is more likely to be meaningful and specific.

In [186...

```python
#Changing dataframe to a list
text = sentiment_analysis_df["text"].tolist()
text
```

```
Out[186…    ['Yes',
             'RT @Starlink: Starlink Mini enables high-speed internet on the go 🛰️ 🚙 ',
             'RT @teslaownersSV: SpaceX is making fully rapidly reusable rockets \n\nThe ho
            ly grail of rocketry. \n https://t.co/VgdOiRKqmT',
             'RT @iam_smx: Elon Musk and his, Son Lil X are inseparable. ❤️\n\n"Hi" http
            s://t.co/J1bnTNyJ5V',
             'Actual public support for @DOGE is super high!',
             'RT @cb_doge: 🚨 KUDLOW: "Everyone is trying to drive a wedge between Elon and
            President Trump. I do not think they are going to succeed in d…',
             'RT @MarioNawfal: ᴜs VETERANS AFFAIRS CHIEF: WE FOUND $980M WASTED IN 2% OF OU
            R CONTRACTS\n\nSecretary of Veterans Affairs, Doug Collins:\n\n"Al…',
             'Thank you, President @realDonaldTrump! https://t.co/3kqZObTixi',
             'Wow 🤯 ',
             'Even after canceling 200k, there are still twice as many government credit ca
            rds as there are government employees!',
             'Sean Hannity: Democrats have become so unhinged https://t.co/neoaJtvMOH #FoxN
            ews',
             'RT @MattWalshBlog: According to the Left, our country's identity has nothing
            to do with religion, ethnicity, tradition, borders, or laws. S…',
             'RT @WesternDecline_: @america The definition of insanity: https://t.co/al7xe0
            zJu6',
             'RT @GuntherEagleman: $900,000,000.00 and just getting started! https://t.co/V
            t1dA1PcCU',
             'RT @charliekirk11: Elon Musk just asking common sense questions any American
            would want to know and receiving death threats, boycotts, and…',
             'The antibody reaction is strong',
             'True',
             'RT @DataRepublican: In the private sector, people do not attempt to destroy s
            omeone's livelihood for holding different political views. Onl…',
             'RT @LauraLoomer: 🚨EXCLUSIVE 🚨\n\nActually, @reidhoffman, you are lying. \nI
            did some investigating myself and have the receipts to prove you ar…',
             'RT @WallStreetApes: 🚨 Artificial intelligence payment tracking reveals Democ
            rats have been laundering our money to NGOs from USAID to fund…',
             'Democrats are pushing hard to *maximize* payments to illegals, eg free luxury
            hotels in New York and free medical care for illegals in California, as that is
            their current and future voter base. https://t.co/LkaQsfcaHJ',
             'RT @nicksortor: 🚨 JUST IN: Elon Musk says DOGE will achieve $1 TRILLION in s
            avings "unless we're stopped."\n\n"Savings at this point exceed $…',
             'So traumatic to answer an email 👩‍\u200d♂️ 😂 ',
             'RT @cb_doge: 🚨 ELON MUSK: "DOGE is trying to act broadly across all the depa
            rtments, it\'s not just one department at a time. We are trying…',
             'RT @LeaveDelaware: 🚨ᴜs Dropbox has officially left Delaware to reincorporate
            in Nevada\n\n"The affairs of the company ceased to be governed b…',
             'RT @nicksortor: 🚨 JUST IN: Elon Musk just exposed EVEN MORE fraud in the fed
            eral government\n\n➡️ 20 MILLION de*d people are listed as alive…',
             "RT @cb_doge: 🚨 ELON MUSK: DOGE is Transparent.\n\nWe post the receipts. It's
            transparent line by line. Everything is posted on our website do…",
             'It will be fine long-term',
             'RT @BasedMikeLee: He's right',
             'RT @CathieDWood: In our view, the market is discounting the last leg of a rol
            ling recession, which will give the Trump Administration and t…',
             'RT @MarioNawfal: ᴜs SEN. KENNEDY: ELON DESERVES A MEDAL\n\n"I think Elon Musk
            deserves a medal. \n\nHis work has just been breathtakingly benef…',
             'Absolutely https://t.co/BQ69XZ3WPI',
             'Describe your favorite island vacation',
             'Absolutely https://t.co/BQ69XZ3WPI',
             'There was (still is) a massive cyberattack against 𝕏. \n\nWe get attacked eve
            ry day, but this was done with a lot of resources. Either a large, coordinated
            group and/or a country is involved. \n\nTracing …',
             'Prophetic',
```

'All that should matter is skill',
 'RT @mboyle1: BREAKING: @OpenAI Sam Altman is ditching @realDonaldTrump to ins
tead host San Francisco fundraiser for Democrat Sen. Mark Warn…',
 'RT @MarioNawfal: 🚨 US NO, ELON DOESN'T WANT YOUR SOCIAL SECURITY NUMBER\n\nEl
on's DOGE team is auditing $1.6T in Social Security payments to f…',
 'You can tell who the bad guys are by who is demanding censorship',
 'This is crazy',
 'This platform is the top source for news on Earth',
 'RT @PressSec: 🚨 Trump Admin repurposes controversial CBP One app to encourage
self-deportations https://t.co/frjm06qwYu',
 'RT @robbystarbuck: If you're on the fence about getting a Tesla, GET ONE. I d
on't say this because I like Elon, I say it because our Tesla…',
 'RT @cb_doge: When Donald Trump requested Elon Musk to join his family photo.
https://t.co/l6jGsjD9nJ',
 'RT @MarioNawfal: ELON: CITIZEN JOURNALISTS OFTEN KNOW MORE THAN LEGACY JOURNA
LISTS\n\n"I think the media is a driver of misinformation much m…',
 'App jiu jitsu',
 'RT @cb_doge: 🚨 NANCY MACE: "I am so grateful every day for what DOGE is doin
g, what Elon Musk is doing in service to his nation.\n\nWhat he\'s…',
 'RT @iamyesyouareno: White babies on pitchforks and signs reading 'Kill White
s' seen at a protest in South Africa. This is being encouraged…',
 'Visual representation of the Social Security database https://t.co/ACP7wcdGi
r',
 'RT @cb_doge: "There\'s a good chance they might try to kill me. \n\nI\'ve had
quite a few friends call me and say, you should definitely improv…',
 'RT @teslaownersSV: If US sinks, we all sink\n\nElon Musk\n https://t.co/aJCld
DXvH0',
 'The fraudsters weren't even trying hard!',
 'RT @GuntherEagleman: Thank you DOGE! https://t.co/GcShAMJsIi',
 'RT @teslaownersSV: Don't google it. \n\nGrok it.\n https://t.co/RL6cc7rekQ',
 "RT @farzyness: I'm having a really hard time deciding what to support:\n\nOne
of America's crown jewels of manufacturing & AI advancing susta…",
 'RT @ElonClipsX: Elon Musk: For the first time, a revolution against bureaucra
cy to restore power to the people could actually succeed. http…',
 'RT @Mick_O_Keeffe: Irish leader Micheál Martin travels to America today, wher
e he is due to meet President Trump on Wednesday. \n\nMartin has…',
 'How can a judge end democracy in Romania?',
 'RT @libsoftiktok: Secretary of State Marco Rubio announces 83% of USAID progr
ams were canceled.\n\nThis is exactly what I voted for! https://…',
 'RT @MarioNawfal: 🚨 RoROMANIAN MP SIMION: HELP US SAVE DEMOCRACY\n\n"What is h
appening these days in Romania is simply unbelievable; we are in…',
 'Wow',
 'Voter ID is fundamental to the integrity of democracy',
 "RT @WholeMarsBlog: Elon: We need to transition to a sustainable energy econom
y\n\nDemocrats: Look at this guy — one of America's most visiona…",
 'True',
 'RT @RobertBentley76: All the protests and stories of vandalism to @Tesla serv
ice centers and harassment of Tesla owners is insane! Let's al…',
 'RT @amuse: OPERATION GREENLAND: Trump is offering the people of Greenland a w
ay out of their European rule. Danish colonizers have ruled Gr…',
 'ActBLUE has committed massive fraud',
 'There's a chance to restore democracy from the bureaucracy, but just a chanc
e. \n\nLong way to go.',
 'RT @PeterSweden7: GB: In Britain, people are thrown in prison for posting mem
es on the internet.\n\nDE: In Germany, a pensioner had his house…',
 "RT @MarioNawfal: SHELLENBERGER: USAID WAS SHUT DOWN FOR REJECTING THE PRESIDE
NT'S AUTHORITY\n\n"The whole reason there's a debate about USAID…",
 'RT @RapidResponse47: GREAT WORK, @SecRubio: Rubio Cuts $60+ Billion In Waste
From State Department,\xa0USAID https://t.co/qC5FnuNW3l',
 'RT @DOGE: More info on IAF: \nIn 2024, ~45% of spend went to administrative o

verhead. Only ~55% went to the grants, which then have multiple…',
 'RT @Rothmus: "5,600 SBA loans to borrowers whose only listed owner was 11-yea
rs-old or younger."\n\nLots of lemonade stands, obviously. https…',
 'RT @teslaownersSV: Can't believe we're living in a time where this is becomin
g normal https://t.co/MD14WW2dgn',
 'So true',
 "RT @ablenessy: We're looking to add hardcore engineers to our team. \nFocusi
ng on accelerating delivery on features like voice mode. https:…",
 'RT @Starlink: Starlink Mini is portable, fits IN a backpack, and connects in
minutes 🛰️ 🔒',
 "RT @SpaceX: View under the launch mount as Super Heavy's 33 Raptor engines ig
nite on Starship's eighth flight test https://t.co/WRCazkhyXs",
 'RT @EricRWeinstein: Driver in front of us (center) at the moment of being for
ced by unexpected oncoming driver over the line (at left), to…',
 'RT @DOGE: All payments (and soon the justifications) will be posted publicly
at https://t.co/CLY5mmtclZ. The first 37,207 grant payments (…',
 'Yeah, why are liberals so violent?\n\nLegacy media propaganda is a major part
of the problem.',
 'RT @MarcusHouse: How crazy is it that this is almost "normal". When SpaceX fi
rst mentioned they would try to catch vehicles out of the sky…',
 'Seriously! The legacy media is whipping people into a frenzy. \n\nAs reported
by the media, a suicide assassin guy was just shot trying to break into the Whi
te House this weekend.',
 'RT @SpaceX: Crew-10, SpaceX, and @NASA completed a full rehearsal of launch d
ay activities https://t.co/jaHNri4LDE',
 'Biden's own @USGAO estimated fraud at up to half a trillion dollars!',
 'RT @MikeBenzCyber: Europe has cancelled more elections than Russia',
 'RT @LauraLoomer: I don't have a Tesla. I just found out while talking to my f
riend who has multiple Teslas that Teslas have something calle…',
 'Costa is committing crimes',
 'RT @RadioEuropes: RO 🚨 BREAKING NEWS\n\nThe candidacy of Calin Georgescu for t
he presidential elections has been rejected by the Electoral Comm…',
 'Soros again …',
 'RT @YunTaTsai1: Levels of spouse tests:\n\n✅ Level 1: take my wife on FSD, wh
ile I am on the driver seat\n ✅ Level 2: let my wife use FSD, while…',
 'This is crazy!',
 'True',
 'RT @chamath: Our current education system is too broken to do the same. We ne
ed school choice asap. https://t.co/dsUGpPg5ea',
 'Absolutely.',
 "RT @SpaceX: Falcon 9 and Dragon roll out to the launch pad at 39A in Florida
for @NASA's Crew-10 mission to the @Space_Station https://t.co…",
 'Heartfelt thanks to everyone supporting @Tesla, despite many attacks against
our stores and offices ❤️ ❤️ ❤️',
 'RT @WallStreetMav: Elon and DOGE have done us well.',
 "RT @iam_smx: A 17 year old boy, Elon Musk arrived in Canada with a bag full o
f books and clothes, he worked on his Mom's cousin's in Saskat…",
 'Cool',
 'RT @cb_doge: 🚨 ELON MUSK: Starlink will never turn off its terminals in Ukra
ine.\n\n"To be extremely clear, no matter how much I disagree wit…',
 'RT @iam_smx: A 17-year-old Elon Musk, wearing a hat on a hat after a long day
working on his second cousin's wheat farm in Saskatchewan, Ca…',
 'RT @iam_smx: Free the Giant!\n\n"We just want sensible regulations. If Presid
ent Trump is elected, we can actually take those actions, and we…',
 'Farmers deserve our respect & admiration!',
 'Yes',
 'RT @RepTonyGonzales: Hard working Americans are tired of giving away $$ to Za
munda for research on squirrels! DOGE is working! It's time fo…',
 'RT @cb_doge: "The diplomats want war and the soldiers want peace."\n\n— Elon
Musk https://t.co/c1cEMUo0fU',

'RT @LibertyCappy: Democrats right now https://t.co/UzGIXsXJPC',
'RT @Riley_Gaines_: 73% of Americans approve of what DOGE is doing in the exec
utive branch\n\nYES on the CR and YES on the soon-to-come DOGE A…',
'RT @GuntherEagleman: Thank you Elon! https://t.co/yOhCdOgw8x',
'RT @teslaownersSV: Legacy auto has insane amount of Nazi history. Here are th
e facts. https://t.co/4YbT3udhX1',
'Men die in trenches every day, while politicians & warmongers eat gourmet
meals',
'RT @RepThomasMassie: Don't forget to set your debt clocks ahead $200 million.
That's how much we go into debt each hour. 😱 https://t.co/N1H…',
'RT @NikoWrex: The Government: Let's tax the BILLIONAIRES so we can spend 2 bi
llion dollars on 100 washing machines!',
'RT @RapidResponse47: .@POTUS: "We want to bring the schools back to the state
s because we have the worst education department and education…',
'What Secretary Rubio says is absolutely correct',
'True, they can now hate us for free 😂',
'RT @RapidResponse47: .@POTUS: "I'm not going to touch Social Security, Medica
re, Medicaid. Now, we're going to get fraud out of there… and…',
'RT @Sec_Noem: For the past four years, our brave men and women of ICE were ba
rred from doing their jobs—ICE needs a culture of accountabili…',
'RT @lavern_spicer: OK let me see if I got this fucking shit right:\n\nAOC had
a muthafucking Colombian ILLEGAL for a campaign aide.\n\nShe used…',
'RT @iamyesyouareno: University student in South Africa wears a 'Kill All Whit
es' shirt. This is socially accepted there. https://t.co/xOibK…',
'RT @GuntherEagleman: "Elon Musk found hundreds of billions of dollars worth o
f fake contracts" - President Trump \n\nThank you Elon and DOGE!…',
'Grok bot responses are getting real 😂',
'RT @MarioNawfal: 🚨 US SEN WHITEHOUSE FUNNELED MILLIONS TO HIS WIFE'S NGO—NOW
FACES ETHICS COMPLAINT\n\nMust be nice: Sen. Sheldon Whitehouse v…',
'RT @RapidResponse47: .@POTUS: "I want a dynamic country where private enterpr
ise carries the day, not the government." https://t.co/jljL3im…',
'Correct',
'RT @MarioNawfal: US COURT UNLEASHES DOGE: ELON GETS ACCESS TO FEDERAL TREASURY
DATA \n\nElon just scored another massive win—a federal judge h…',
'RT @teslaownersSV: The future should look like the future. \n\nCybercab is in
sane 🤯🤯🤯\n https://t.co/uCe71HON92',
'RT @WallStreetApes: How has Stacy Abrams not been raided by The FBI\n\n"Did y
ou see where that $2 billion of that money for Stacey Abrams wen…',
'RT @libsoftiktok: Biden allocated $42.5 billion to connect people with high-s
peed internet.\n\nIt's now March 2025 and not a single person wa…',
'RT @MAGA__Patriot: Absolutely agree 100%! 🎯 \n#DOGE https://t.co/iJ8kJoOzH6',
'I thought she loved communists, since she is one herself 🧛\u200d♂ ',
'Wow',
'RT @cb_doge: 🚨 ELON MUSK: "Basically the government funded NGOs are a way to
do things that would be illegal if they were the government.…',
'First of the new Model Y design delivered from our US factories!',
"RT @ElonClipsX: Elon Musk:\xa0I completely lost respect for Obama when he rep
eated the fine people lie knowing it's false.\n\n"A ton of people t…",
'Delete the NGOs',
'RT @ElonClipsX: Elon Musk: I strongly recommend studying physics as a groundi
ng to understand reality.\n\n"I studied physics, and I certainly…',
'RT @MegynKellyShow: .@MegynKelly: "I lost a friend recently over politics. An
d it was an upsetting evening, where I was like \'whoa, what\'s…',
'RT @elonmusk: @AdamLowisz I literally challenged Putin to one on one physical
combat over Ukraine and my Starlink system is the backbone of…',
'Place sanctions on the top 10 Ukrainian oligarchs, especially the ones with m
ansions in Monaco, and this will stop immediately. \n\nThat is the key to the p
uzzle.',
'This guy probably does actually exist',
'Yes',

"RT @teslaownersSV: "I cannot be President, and I actually don't want to be President. So, to be clear, I want to build rockets and cars."…",
'Total completion cost of the Tesla Cortex 1 AI training cluster will be ~$5B',
'We really should. \n\nDoesn't make sense for America to pay for the defense of Europe.',
'I miss him',
'RT @EndWokeness: 5 years ago https://t.co/reS13sR8Oz',
'RT @MarioNawfal: JOE ROGAN: THINGS ARE BETTER THANKS TO ELON BUYING X\n\n"We\'re getting past the days where everything was tight and everybod…',
'Good idea',
'Cool',
'Great idea',
'RT @DOGE: In 2020-2021, SBA granted 5,593 loans for $312M to borrowers whose only listed owner was 11 years old or younger at the time of t…',
'RT @MattWalshBlog: Christians are the most persecuted group in the world. Their plight is almost entirely ignored by corporate media. The h…',
'How many people are being killed?',
'True',
'RT @IanJaeger29: BREAKING: Small Business Administrator, Kelly Loeffler announces that she is implementing citizenship verification for loa…',
'RT @MarioNawfal: 🚨 SUNDAY On 69 𝕏 MINUTES: GLOBAL CENSORSHIP, POLITICAL CRACKDOWNS & IS WOKENESS FINALLY DEAD?\n\nThis week, we dive into Sui…',
'RT @DOGE: Contract update! \n\nOn Friday, there were 162 cancellations of non-essential contracts with a ceiling value of ~$205M and savings…',
'Wow',
"RT @chaitualuru: We shipped 20 app updates in the last two weeks containing Grok 3, SuperGrok, Think & DeepSearch, and Voice Mode. We're lo…",
'Who are the individuals behind this?',
'RT @tesla_na: The future is golden and bright',
"RT @SpaceX: Liftoff of Starship's eighth flight test https://t.co/Vx8tSbgBD5",
'RT @MarioNawfal: 🚨usMAYE MUSK CALLS OUT TESLA VANDALS: "PAID CRIMINALS OR MEDIA-BRAINWASHED"\n\n"People who are damaging Tesla cars, stores a…',
'Yeah, it's outrageous!',
'Strong support',
'RT @SawyerMerritt: Tesla Cybercab autonomously cruising around Giga Texas today.\n\nCan't wait until these things are everywhere on public ro…',
'Cool',
'RT @WesternDecline_: @elonmusk Reminder that Elizabeth Warren was caught diverting funds intended for victims of the LA fires to ActBlue.…',
'RT @rookisaacman: Ever since the space race of the 1960s, people have asked why we invest in space when there are problems here at home. Th…',
'RT @MarioNawfal: 🚨usBREAKING: SOROS-FUNDED GROUPS BEHIND TESLA PROTESTS \n\nI am shocked...\n\nThe usual suspects strike again—ActBlue-funded g…',
'So many crosses',
'Yeah',
'Wow',
'That's me 💯',
'Massive',
'Where did your taxpayer money go?',
'Interesting',
'Absolutely',
'RT @YunTaTsai1: Years ago, I did not bother to pay $1200 for Google Glasses that my team was working on.\n\nThis year, I did not hesitate to…',
"RT @Grummz: The person who leaked all of @Doge emails is followed by gaming's worst:\n\nairbagged (Antifa member)\nalyssa mercante (Former Kot…",
'RT @MikeBenzCyber: Well that explains the Theranos fraud scandal. Elizabeth Holmes certainly learned "Lessons in Leadership" from USAID htt…',
'An investigation has found 5 ActBlue-funded groups responsible for Tesla "pro

tests": Troublemakers, Disruption Project, Rise & Resist, Indivisible Proje
ct and Democratic Socialists of America.\n\nActBlue funders include George Soro
s, Reid Hoffman, Herbert Sandler, Patricia Bauman,',
 'RT @WholeMarsBlog: The Tesla Takedown protests that aim to destroy Tesla in o
rder to attack Musk were organized by Alex Winter, also known…',
 'RT @joma_gc: So let me get this straight. Jasmine Crockett gets elected Novem
ber 2022, and according to her financial disclosure report had…',
 'RT @iamyesyouareno: Must be nice having a home country to go back to. A safe
haven full of your own people—what's that like? https://t.co/p…',
 'RT @LibertyCappy: Many such cases https://t.co/nllGJyUGQk',
 'Hmm',
 'RT @CollinRugg: JUST IN: Bill Nye apparently does a "Nazi salute" while rally
ing up an anti-Trump crowd.\n\nThe salute was almost identical t…',
 'Good for him',
 'Yes.',
 'RT @teslaownersSV: Can't believe this really happened. https://t.co/1yHPPri5j
9',
 'Interesting thread',
 'RT @MarioNawfal: 🚨usSOROS SPENT MILLIONS ON DAs—NOW CRIME IS SOARING\n\nCiti
es got the prosecutors he paid for, and now they're getting the c…',
 'It's a start',
 'RT @SecRollins: 🚨CANCELLED: $600,000 grant to study "menstrual cycles in tra
nsgender men"\n\nKeep sending us tips. THANK YOU, @approject! The…',
 '✨look up at the stars ✨',
 'RT @Tesla: Design & engineering walkthrough of New Model Y https://t.co/2
jvMQOXGkM',
 'RT @nicksortor: 🚨 NOW: President Trump, Elon Musk, and Howard Lutnick are bo
arding Marine One from the White House headed to Mar-a-Lago\n\nA…',
 'Exactly',
 'Wow',
 'RT @thatsKAIZEN: Trump threatening Russia with sanctions begs the question: W
hat will it take for the media to be positive about Trump? htt…',
 'RT @WallStreetMav: DOGE is going to make significant progress towards balanci
ng our federal budget. Our budget deficit is $2 trillion per y…',
 'RT @RapidResponse47: PRESIDENT TRUMP: For the first time in fifteen months, t
he job gains for native-born Americans exceeded the job gains…',
 'Great move to fight corruption',
 'One of the hardest technology problems ever, but it must be done',
 'RT @ns123abc: 🚨🚨🚨BREAKING: Microsoft has begun cutting ties with OpenAI a
nd is now testing models from xAI, Meta and DeepSeek for replaceme…',
 'This is very positive. \n\nOutput of products & services, and thereby ave
rage standard of living, improves when people move from low to negative product
ivity jobs to high productivity jobs.',
 'RT @amuse: GENOCIDE: Trump is inviting South African farmers with families th
at are being targeted based on the color of their skin to come…',
 'RT @Starlink: Connect to high-speed internet onboard @United flights from gat
e to gate 🛰️✈️',
 'Starlink starting on @United Airlines!',
 'Do you support @DOGE reducing government waste & fraud?',
 'True',
 'RT @cb_doge: Millions in South Africa could benefit from Starlink, but it's n
ot allowed just because Elon Musk isn't black. This is an inju…',
 'Wow',
 'You're welcome. \n\nThankfully, this administration cares about all people.',
 'True\n https://t.co/jJlVtZAohP',
 'RT @WallStreetApes: Rep Tim Burchett says he's willing to lose his job to tel
l us the REAL REASON government officials are opposing Elon Mu…',
 'RT @LibertyCappy: Why are Woke Leftists like this? https://t.co/CH0ENnOs8c',
 'RT @Inevitablewest: @jurgen_nauditt Probably because the Americans voted him
in and support him?\n\nAre you retarded?',

'RT @RapidResponse47: 🚨 NEW: President Donald J. Trump signs an executive ord
er suspending the security clearances for employees at Perkins…',
"RT @iam_smx: Elon Musk's Starlink is not allowed to operate in South Africa s
imply because Elon isn't black, absolutely shameful. https://t…",
"RT @konstructivizm: This is Daphnis, one of Saturn's moons.\n\nThis image sho
ws its unusual gravitational effect on Saturn's rings. https://t…",
'RT @PhysInHistory: Werner Von Braun standing next to the five F-1 engines of
a Saturn V on display at the U.S. Space & Rocket Center\n\nThe S…',
'Yes',
'Ironic',
'Starlink is not allowed to operate in South Africa, because I'm not black',
"RT @EricLDaugh: NEW: Senator Rand Paul (R-KY) calls on Congress to make all o
f DOGE's cuts permanent.\n\nDo it. https://t.co/53T6aoPCML",
'RT @RadioEuropes: The leader of the Rotherham grooming gang, Banaras Hussain,
has been released.\n\nHussain raped 15 11-year-old girls for 10…',
'RT @JDunlap1974: NEW: El Salvador President Nayib Bukele reacts to judges ove
rstepping their authority to hamstring Trump and DOGE\n\n"That's…',
'RT @RapidResponse47: .@SecScottBessent: "Let me be clear: the U.S. does NOT h
ave a revenue problem — we have a spending problem." https://t…',
'True',
'RT @BasedMikeLee: On NPR tonight, they talked about measles—and suggested @Ro
bertKennedyJr is somehow to blame for outbreaks\n\nThey didn't p…',
'Try it!',
'RT @JesseBWatters: EXCLUSIVE: @LeeMZeldin exposes the GREEN SLUSH FUND. $20 b
illion given to 8 NGOs towards the end of the @JoeBiden admini…',
'Ask @grok is now live. \n\nJust reply to a post with @grok!',
"RT @cb_doge: How it started   v/s   How it's going\n\n https://t.co/4H4TZ
pjztZ",
'RT @cb_doge: Just Grok It! https://t.co/n3ECS3FAAh',
'RT @davidsacks47: Historic moment! Thank you, President Trump! https://t.co/Q
l6lG63EEU',
'RT @teslaownersSV: SEN. KENNEDY: "I think Elon Musk is a rockstar. The tofu c
rowd is mad, but when you trim fat, pigs squeal."\n https://t.c…',
'RT @michelletandler: Ever since I registered as a Republican, I feel much hap
pier and lighter. \n\nPerhaps I am living my truth... 🐘',
"RT @cb_doge: Elon Musk during today's meeting with Secretaries and President
Trump. https://t.co/WHkIGOSyCK",
'RT @johnkrausphotos: That was a beautiful launch and landing. Progress is not
always linear and I know the SpaceX team will continue to ite…',
"RT @DillonLoomis22: This car is insanely awesome\n\nI'd venture to guess many
of the people crying about Tesla have never owned one or even b…",
'RT @MarioNawfal: usWHITE HOUSE CALLS OUT CNN OVER 'TRANSGENDER MICE' FACT-CHE
CK\n\nFirst, CNN said Trump "falsely claimed" federal money fund…',
'RT @johnkrausphotos: Closeup of Super Heavy Booster 15's landing burn during
today's catch and landing https://t.co/vS6jtqYTV4',
'RT @LeaveDelaware: 🚨Walmart to consider leaving Delaware\n\n- Semafor http
s://t.co/AMbPWj226r',
'RT @johnkrausphotos: Liftoff: Starship Flight 8 https://t.co/7hS39Ch4F6',
'RT @MarioNawfal: 🚨 BwBOTSWANA ENTERS THE SPACE AGE WITH SPACEX\n\nBotswana's
President toured SpaceX's Hawthorne facility ahead of a historic…',
'RT @SpaceX: Mechazilla has caught the Super Heavy booster! https://t.co/JFeJS
dnQ5x',
'RT @RepBrandonGill: Our work with DOGE is only beginning.\n\nWe're going to t
ake a flamethrower to the federal budget.\n\nGlad to join @Ingraha…',
'Hmm',
'RT @thatsKAIZEN: If you're worried about Trump ending the Department of Educa
tion, ask yourself - what has that department even been doing?…',
'RT @WhiteHouse: "We just had a meeting with most of the Secretaries, Elon, an
d others, and it was a very positive one. It's very important…',
'Starship launch attempt now!\n@SpaceX',

 'Wow',
 'Thanks usus\n https://t.co/Jj9eTukVnb',
 'Where did Senator Karen get $67 million?',
 "RT @SpaceX: Counting down to Starship's eighth flight test. Weather looks favorable at the pad and the 60-minute launch window opens at 5:3…",
 'RT @SpaceX: Dragon arrives at the hangar at pad 39A ahead of next week's launch of @NASA's Crew-10 mission to the @Space_Station https://t.…',
 'RT @WholeMarsBlog: Drove around with FSD in the rain for hours. \n\nEvery single drive was perfect and zero interventions. \n\nAt this point if…',
 'Correct',
 'Very productive meeting https://t.co/RrMYb3CGh5',
 'How many states who have been blue for so long are sick & tired of failed Democrat policies?\n\nUnsafe and dirty cities with oppressive state governments and yet super high taxes? You are getting ripped off!',
 'It's true. \n\nThere was an insane slaughter of 150 million egg-laying chickens ordered by the Biden administration.',
 'Bigtime. \n\nThe Democrat government-funded NGO scam might be the biggest theft of taxpayer money ever.',
 'Ukraine needs to hold an election. \n\nZelensky would lose by a landslide.',
 'Democrats are cruel https://t.co/UuLuey7Pgq',
 'RT @txsalth2o: America Still Needs a Covid Reckoning\n\nThe virus didn't cause lockdowns. Human beings decided to impose lockdowns, which fai…',
 'RT @GuntherEagleman: These indoctrination camps have to end. https://t.co/T7HLHzmUgj',
 'RT @MarioNawfal: 🚨POLISH PM TUSK: EUROPE WILL OUTPACE RUSSIA IN MILITARY BUILDUP\n\nPolish PM Donald Tusk declared that Europe will rearm "mo…',
 'Actually accurate',
 'RT @libsoftiktok: BREAKING: Rep. Anna Paulina Luna is referring ALL FOUR mayors at today's hearing for criminal prosecution!\n\nEric Adams, M…',
 'RT @libsoftiktok: "I voted for Democrats my whole life. They never did anything they promised.... "I vote for a Republican once in my life,…',
 'Accurate',
 'This is crazy',
 'RT @RapidResponse47: .@paytonmcnabb_: "Last night, I thought that the pink suits and everyone matching was cute when of course, the day bef…',
 'RT @libsoftiktok: TOM HOMAN IS ON FIRE 🔥 \n\n"For the congressmen who keep saying they [illegals] commit less crime than Americans— who cares?…',
 'RT @cb_doge: We are going straight to MARS! https://t.co/TlG791JgnO',
 'Yes',
 'RT @RepBrandonGill: Elon Musk and DOGE are uncovering governmental ineptitude and waste on a scale that is hard to fathom https://t.co/HnX3…',
 'RT @VP: Turns out all we needed to secure the border was a new president.\n\n@POTUS https://t.co/OZU1j53ppd',
 'True',
 'RT @MarioNawfal: 🚨 usX WINS FIRST AMENDMENT FIGHT AGAINST CALIFORNIA—PERMANENT INJUNCTION BLOCKS CENSORSHIP LAW\n\nX just secured a major vict…',
 'RT @MarioNawfal: SPEAKER\xa0MIKE\xa0JOHNSON: DOGE WILL IMPROVE GOVERNMENT ACCOUNTABILITY TO TAXPAYERS\n\n"Elon Musk explained his transformative wo…',
 "RT @MikeBenzCyber: Here's Jeffrey Sachs testifying that right after the 2014 overthrow of Ukraine's democratically elected government, he w…",
 'RT @WallStreetApes: The curtains are being pulled back\n\nJoe Rogan "Essentially DOGE has found the coffin where the vampire sleeps"\n\nElon Mu…',
 'What is this court and how can they annul elections?',
 'RT @DimaZeniuk: 🔥🔥 33 Raptor engines 🔥🔥 https://t.co/UhbaXvhw4u',
 'RT @dvorahfr: I strongly support Elon Musk\nI strongly support Free-speech\nI strongly support X https://t.co/rw3HxNqWhM',
 'Just in time',
 'Yes!',
 'The NSA needs an overhaul https://t.co/93TnOIUIOy',
 'Yes',

'RT @SpeakerJohnson: Thank you, Mr. President. We'll get it done! https://t.co/10dmT7ckch',
'RT @PeterSweden7: What if I told you about a country where they give people different sentences based on skin color and religion.\n\nWhat if…',
'Yes us',
'Wow',
'RT @StockMKTNewz: Tesla's Model Y was the best selling car model in the world in 2024 https://t.co/TRIxya90bz',
'RT @teslaownersSV: Hop in Let's go to Mars. https://t.co/YCpHlL5taH',
'RT @GuntherEagleman: Trump just ROASTED the Democrats. 🤣 https://t.co/LgUwySPL1D',
'RT @teslaownersSV: "I will fight to my last drop of blood to ensure that us remains the land of freedom and opportunity"\n\nElon Musk https:/…',
'That's the goal: get the government off your back!',
'Indeed',
'RT @teslaownersSV: "I want no pay, no awards, no recognition or fancy title. I just want us to reach greater heights."\n\nElon Musk https://t…',
'RT @MarioNawfal: 🚨 us SENATE GOP MEETS WITH ELON, PLANS TO CODIFY DOGE CUTS INTO LAW\n\nSenator Graham announced that Senate Republicans had…',
'Allowing government-funded non-governmental organizations, which is obviously a contradiction in terms, is a crazy flaw in the system enabling massive fraud that is extremely hard to trace!',
'RT @cb_doge: Department of Government Efficiency us https://t.co/h8pAvsHMGX',
'They want the forever war. \n\nHow many more parents with no sons?\n\nHow many more children with no fathers?\n\nBy their logic, it never ends.',
'RT @cb_doge: Elon Musk in his DOGE meeting with GOP senators today:\n\n"You don\'t need to be a detective, like Sherlock Holmes, in order to…',
'RT @cb_doge: "We are here to defeat Bureaucracy!" 🤯us https://t.co/XdoSlTf80A',
'There are vast numbers of unused software licenses in every part of the government. \n\nYour tax dollars are being wasted.',
'RT @DOGE: Weekly Credit Card Update!\n\nPilot program has been expanded to 16 agencies to audit unused/unneeded credit cards. After 2 weeks,…',
'RT @JamesLucasIT: Thread of beautiful Art Deco designs 📝   \n\n1. Cincinnati Union Terminal https://t.co/x0Hzse8W48',
'RT @L0m3z: Illustrative exchange of why the Springfield story was so effective. Open borders lunatics find themselves screeching over techn…',
'RT @CollinRugg: NEW: Astronaut says Elon Musk is "absolutely factual" after a WaPo reporter asked him about how Musk said his rescue effort…',
'RT @cb_doge: BREAKING: Elon Musk just revealed his phone number.\n\n"Something 8008" 😂🔥 \n\n https://t.co/C2vOufmL76',
'Sounds like a good idea',
'The astronauts were only supposed to be up there for 8 days and now have been there for 8 months. \n\nSpaceX could have sent up another Dragon and brought them home 6 months ago, but the Biden White House (not NASA) refused to allow it. \n\nPresident Trump asked to bring them back as',
'RT @JustinRGoodman: @dr_andrealove 😁 Here are direct quotes from NIH-funded grants and NIH-funded peer-reviewed papers reporting TRANSGENDE…',
'Major fraud',
'Major problem',
'Sex change surgery severely harms mental health',
'Yes',
'There are still almost twice as many credit/purchasing cards as people in the government, and the limits are $10,000! \n\nA lot of shady expenditures happening.',
'An excellent choice for @NIH director!',
'RT @CollinRugg: Last year, young DJ Daniel was harassed and made fun of by a group of people because of his police outfit.\n\nLast night, he…',
'RT @_johnnymaga: This has a quarter million likes on TikTok: https://t.co/f0WgqeUBJv',

'Good',
 'RT @stevenmarkryan: Trump Says US Will Plant Flag On Mars\n\n"The golden age of America has only just begun" https://t.co/9wC6t3upWi',
 'RT @charliekirk11: An illegal immigrant just stabbed and murdered a Washington State high school student. \n\nThis is exactly why we need mas…',
 'RT @GadSaad: You might recall in chapter 7 of The Parasitic Mind wherein I referenced a theory that posits that human reasoning did not evo…',
 'RT @america: President Donald Trump: The "common sense revolution" is sweeping the world.\n\n https://t.co/BieLYfZI5k',
 'Interesting',
 'Cool',
 'RT @CilComLFC: ɪᴛ Italian PM Giorgia Meloni:\n\n"The Left predicted that I would destroy Italy, but they were wrong. Employment is at a Recor…',
 'If daylight savings time change is canceled, do you prefer',
 'Cool',
 'The level of propaganda at elite universities would make North Korea jealous!',
 'RT @MarioNawfal: 🚨 ᴀʀ MILEI ENDS FORCED UNION FEES FOR WORKERS\n\nPresident Milei has signed Executive Order #149/25, ending a rule that force…',
 'RT @farzyness: Within all the political noise, Tesla has been making some pretty giant moves.\n\nTesla FSD appears to be almost/best performi…',
 'RT @charliekirk11: One of the amazing moments from last night. Truly touching and great to see, even if the Democrats couldn't muster the h…',
 'RT @SawyerMerritt: Elon Musk is a mission-driven individual—always has been. It would be stupid to assume he's motivated by personal financ…',
 'RT @RepHaridopolos: President Trump said it himself: \n\nWe're going to lead humanity into space and plant the American flag on MARS! https:/…',
 'RT @matt_vanswol: Dear democrats,\n\nI used to vote for you.\n\nI believed you when you said you stood for women's rights.\n\nI believed you when…',
 'RT @DOGE: Yesterday, @NIH cancelled seven grants for transgender experiments on animals including:\n- $532K to "use a mouse model to investi…',
 'RT @libsoftiktok: Elissa Slotkin (D): "Is there anyone in America who is comfortable with Elon and his gang of 20-year-olds using their com…',
 'RT @libsoftiktok: We're going to plant a flag on Mars!! 🚀 https://t.co/IaB37T8VQl',
 'RT @iam_smx: The Dogefather, Elon Musk. https://t.co/mErlG2vWGz',
 'Exactly',
 'After tonight, I am increasingly convinced that we can get to 60 Senators',
 'Try unhinged voice on @Grok app 🤣🤣',
 'RT @teslaownersSV: Caption This! https://t.co/DpCpTsFiMg',
 'ᴜꜱ We will do the right thing ᴜꜱ',
 'RT @MarioNawfal: 🚨 ᴜꜱ BUKELE VINDICATED: TRUMP CUTS 92% OF USAID AFTER PRESIDENT EXPOSED AGENCY IN 2021\n\nThe Trump administration is elimin…',
 'ᴜꜱᴜꜱ Epic speech by @POTUS! ᴜꜱᴜꜱ',
 'The only flag being waved and the ONLY cheer by Democrats was for another country. They hate America.',
 'RT @cb_doge: 🚨 BREAKING: President Trump thanked Elon Musk for his contributions to DOGE. The crowd erupted in cheers as the President intr…',
 'RT @naval: Anything the red Feds do, blue can undo, and vice versa.\n\nBut *transfer* power and money from the Feds to the states - both red…',
 'The oldest living American is Naomi Whitehead, who is 114 years old',
 'Should note that I grew up as English South African, not Afrikaans, and consider myself to be simply an American. \n\nNo hyphen. \n\nThat said, what's happening in South Africa is deeply wrong. Not what Mandela intended at all.',
 'Wow, some impressive use of @Grok here!',
 'So recent',
 'RT @SawyerMerritt: DOGE now estimates they have saved a total of $105 billion to date, which equates to approximately $652 per taxpayer. ht…',
 'Important to note that the date of publication of the half trillion dollar annual fraud estimate from @USGAO is last year during the BIDEN administration',

'RT @cb_doge: Starship, Booster and Planet Earth 🪝 https://t.co/hY547yUvVl',
'It works',
'RT @Fidias0: How to Legally Force the EU to Listen to You https://t.co/JeOHNu9oaA',
'RT @DC_Draino: CitiBank has a lot of explaining to do\n\nThey're caught up in a huge money laundering scam where they hold $20 Billion in tax…',
'Be careful what you wish for',
'RT @JDVance: These people are such idiots. We had a great time during our weekend in Vermont. We barely noticed the protesters and almost e…',
'RT @MarioNawfal: ELON: IT SHOULDN'T BE EASIER TO GET INTO THIS COUNTRY AS A MURDERER THAN AS A NOBEL LAUREATE\n\n"We have this bizarre situat…',
'Cool',
'Sorry 🙆 🙇\u200d♂️ 😂',
'Unhinged @Grok voice is next-level 🤣🤣',
'I love that trick. Works every time 😂',
'Stole a million dollars of taxpayer money? 🫢',
'F\nA\nF\nO',
'Making govt waste an offer it can't refuse https://t.co/PGTdkXstvu',
'Yes',
'They need to return the money',
'RT @thatsKAIZEN: For God's sake - Trump is literally stopping WW3 with Russia, stopping fentanyl coming across our borders with tariffs, ex…',
'Strong men make good times',
'A lot of people need to move from low to negative productivity roles in government (and some in industry) to high productivity roles in the commercial sector. \n\nThat is temporarily disruptive, but ultimately for the best.',
'RT @TheRabbitHole84: 🚒 Honk 🚒 https://t.co/3rh0EeBNP6',
'Such lazy puppets smh',
'Unlike the 23 Dem senators too lazy even to pick up a thesaurus, President @realDonaldTrump is his own person',
'23 Dem senators too lazy even to reach for the thesaurus 🤣🤣 https://t.co/eAD1VYE9XT',
'How many of the puppets below also have a picture with Soros?\n\nHigh correlation, I bet.',
'RT @karmaycholera: To everyone hating on @elonmusk:\n\nHistory is the ultimate judge. People have always been condemned by some and defended…',
'The public now knows that they're all just puppets with no mind of their own 🤡🤡',
'Something to think about',
'RT @jasondebolt: I wish more people understood this.\n\nIf what David is saying here was more widely understood, there would be a lot less po…',
'Actions, not words, are what matter. \n\nLet's see what actions take place.',
'RT @nicksortor: 🚨 UPDATE: An ASTOUNDING **22** Democrat Senators have uploaded videos of themselves reading off an identical cringey script…',
'Now we're up to 22 Dem senators all doing the same cringe video simultaneously!\n\nI will buy a Cybertruck for anyone can provide proof of who wrote this particular piece of propaganda. \n\nFirst person to post proof in the replies to this post gets the truck!',
'Did Adam Schiff commit treason? Sounds like he did.',
'17 politicians all saying the exact same thing at the same time!!\n\nSuch lazy propagandists they are 🤨',
'And who told them ALL to hold the microphone like they're a teenager doing TikTok videos 🤣🤣',
'Worst puppet show ever 🤡🤣',
'RT @Grummz: Blackrock drops DEI under Trumps new guidelines!\n\nThis is monumental. Blackrock was the biggest pusher of DEI in 2020 and 2021,…',
'Confirm @ElbridgeColby!',
'Ok, so who is sending the social media interns of the politicians what to post?',
'RT @charliekirk11: Vice President @JDVance introduces Elbridge Colby to the S

enate Armed Services Committee to become the 3rd highest ranki…',
 'True',
 'RT @LisaSu: Huge step forward for advanced chip manufacturing in the U.S. We have seen great results as a lead customer @TSMC in Arizona a…',
 'It's a valid point. The rules are asymmetric.',
 'Exactly',
 'Can't someone be bothered to write three speeches? This is just lazy 😂',
 'RT @BasedMikeLee: It's almost like someone's telling Democrats what to say',
 'Who is writing the words that the puppets speak? That's the real question.',
 'USAID was interfering in governments throughout the world and pushing radical left politics',
 'They are all actors reading a script',
 'RT @MarioNawfal: 🚨 12 HOUR NEWS RECAP\n\n1. Trump paused all military aid to Ukraine, escalating tensions days after his heated Oval Office me…',
 'RT @MarioNawfal: 🚨 69 𝕏 MINUTES — RAW. UNCENSORED. UNSTOPPABLE.\n\nWelcome to Episode 2 of 69 𝕏 Minutes—where no one's pulling the strings, no…',
 'RT @KingBobIIV: Remember in Orwell's 1984 when, in the middle of Hate Week, Oceania suddenly switches its enemy? One minute, everyone is ra…',
 'RT @MarioNawfal: 🚨 ʀoEXCLUSIVE: ROMANIAN MEP - WE ARE NO LONGER A TRUE DEMOCRACY\n\nGeorgiana Teodorescu:\n\n"We had a huge protest in Romania t…',
 'RT @libsoftiktok: DOGE canceled a $215 million contract for a Texas nonprofit which operated a housing facility for migrants.\n\nThe housing…',
 'RT @sdamico: This is ~ahead of the modal Chinese consumer electronics factory. Crazy that in the US only SpaceX and Tesla can do it.',
 'RT @Regulawyer: A friend borrowed my Tesla with FSD for a week. Here's how it went: \n\n(Note: She has never been a Tesla enthusiast. She's a…',
 'Fixed now. Just basic block and tackle stuff.',
 'Yet another scam stealing your tax dollars has been stopped\n https://t.co/eyYfg7xemJ',
 'This was asked of children. \n\nStop this madness.',
 'My post below was almost 2 years ago. \n\nStop sending men to die for nothing. \n\nENOUGH!!',
 'RT @libsoftiktok: Giant male in a MA school injured 3 girls during a girls basketball match. They ended the game early before he can hurt m…',
 'Well, at least your federal tax dollars aren't paying for it, just New York tax dollars pay for it now',
 'RT @TheGigaCast: Every Tesla EV sold in America was made in America 🇺🇸 https://t.co/ahwhsyQtLi',
 'RT @MarioNawfal: 🚨 🇺🇸HUMAN SMUGGLING RING BUSTED IN LOS ANGELES\n\nThis wasn't just any smuggling ring—it was one of the biggest in U.S. histo…',
 'Yes\n\nhttps://t.co/LNbqvhF5EK',
 'RT @DOGE: Updated data on DEI related contract cancellations (separate from grants) by agency: https://t.co/mq7RkMCFEE',
 'RT @Truthful_ast: Oh man the two towers look sick https://t.co/KDez3z95cS',
 'RT @KristenWaggoner: The votes are in. Here's the difference between the American public & U.S. Senate on who supports protecting women's s…',
 'RT @cb_doge: You are the media now. https://t.co/nq4PHeM4vl',
 'Maybe they should meet for tea …',
 'RT @ablenessy: Give Grok Android Beta a try, let me know what you think.\nhttps://t.co/lMiIh1AR9F',
 'RT @MarioNawfal: 🚨 🇺🇸 SCOTT JENNINGS: TRUMP IS MORE POPULAR THAN ANY DEMOCRAT—AND REPUBLICANS LOVE WHAT HE'S DOING\n\n"You guys keep trying to…',
 'Unhinged @Grok is next-level 🤣🤣',
 '🤦\u200d♂️ \n\nTaxpayer-funded propaganda!',
 'So Senator Richard Blumenthal, aka "Dick", really wants to meet "Big Balls"!!\n\nThis is too good 🤣🤣',
 '"Big Balls" lmaooo',
 'RT @MarioNawfal: 🚨 🇺🇸 SHELLENBERGER: DEMOCRATS ARE NOW THE PARTY OF \'NO, YOU CAN\'T\'\n\n"I don't think people believe Elon is doing this for mo…',
 'RT @SpaceX: To meet the growing global demand for high-speed internet, @Starl

ink is expanding its factory in Bastrop, Texas https://t.co/dx…',
 'RT @DOGE: The Office of Personnel Management (~2500 employees) budgeted $370M for IT spending in FY2025. They believe this value can be re…',
 'RT @JDVance: Hope is not a strategy to bring peace to Ukraine.\n\nThe only person in town who seems to have a strategy is President Donald J.…',
 'RT @KanekoaTheGreat: NEW: David Sacks says Democrats now support endless war, Zelensky wants the war to never end, and Joe Biden could have…',
 'Wow',
 'RT @MarioNawfal: ᴜsᴜᴀDAVID SACKS: I DON\'T THINK ZELENSKY WANTS PEACE\n\n"He says that the war needs to keep going on.\n\nIf the war is over, he…',
 'RT @MarioNawfal: ᴜsᴜᴀDAVID SACKS: WE NEED TO AUDIT UKRAINE\n\n"There\'s definitely been Ukrainian officials who\'ve been caught leaving the cou…',
 'RT @MarioNawfal: 🚨STEPHEN MILLER: TRUMP\'S PRESIDENCY IS THE MOST SUCCESSFUL START IN HISTORY\n\n"President Trump is the greatest orator we\'ve…',
 'Congratulations! ᴜsᴜs',
 'RT @WhiteHouse: MEN DO NOT BELONG IN WOMEN'S SPORTS. https://t.co/iskbT6H3YU',
 'RT @RapidResponse47: The Protection of Women and Girls in Sports Act was just blocked in the Senate.\n\nWhy do they want boys to play in your…',
 'RT @nicksortor: 🚨 #BREAKING: Democrats just BLOCKED the bill meant to protect women and girls in sports\n\nWhen Democrats say they're fightin…',
 'Wow',
 '$80M in ridiculous spending eliminated!',
 'Too many question marks about this flight and then we were 20 bar low on ground spin start pressure. \n\nBest to destack, inspect both stages and try again in a day or two.',
 'RT @SpaceX: In addition to continued infrastructure development at Starbase, Texas, where SpaceX is headquartered, SpaceX is expanding its…',
 'RT @SpaceX: Starship's flight trajectory for today's test https://t.co/UeshY3RHQf',
 'Raptor 3 has almost twice the thrust and much higher reliability than Raptor 1, despite costing about four times less!',
 'This would be cool',
 'RT @techdevnotes: Grok 3 is back on TOP!',
 'About 42 minutes until Starship Test Flight 8!\n https://t.co/ehwWcap7Uh',
 'RT @MarioNawfal: 🚨GROK-3 CLAIMS TOP SPOT—xAI BEATS THE COMPETITION\n\nGrok-3 just tied for #1 on the Arena AI leaderboard, proving it's a pow…',
 'RT @WhiteHouse: President Trump's Address to Congress Theme Reveal!\n\nTHE RENEWAL OF THE AMERICAN DREAM ᴜs\n\nTomorrow night, 9 PM ET! https:/…',
 'RT @RapidResponse47: 🚨 President Donald J. Trump announces a new $100 billion investment by TSMC in U.S. chips manufacturing https://t.co/2…',
 'If you haven't tried unhinged voice mode on the @Grok app, you're missing out 🤣🤣',
 'RT @SpaceX: The Starship team is go for prop load. Targeting 5:45pm CT for liftoff of Starship's eighth flight test.\n\nThe launch webcast wi…',
 'Major conflict of interest!',
 'True. \n\nAs distasteful as it is, Zelensky should be offered some kind of amnesty in a neutral country in exchange for a peaceful transition back to democracy in Ukraine.',
 'The NGOs are trying to destroy democracy!',
 'We had an ace up our sleeve @xAI. Turns out to be just enough to hold first place!\n\nUpgrades are in work to address presentation quality/style vs competition. That will shift ELO meaningfully higher.',
 'RT @spacesudoer: Starship flight 8 mission profile. https://t.co/i1bkN8AFNx',
 'RT @cb_doge: BREAKING: President Trump is more popular than ever as per the new approval tracker by the Daily Mail and JL Partners. ᴜs http…',
 'Interesting',
 'Even JFK and Clinton!',
 'Interesting \n https://t.co/9hbztcM9wV',
 'True',

'RT @fentasyl: Over $450,000,000 of HHS FY24 grant-funded projects contain terms used by the far-left to express their hatred -- Health Scie…',
'RT @RapidResponse47: .@POTUS: "President Zelenskyy supposedly made a statement today -- He said he thinks the war is going to go on for a l…',
'RT @MarshaBlackburn: For far too long federal bureaucrats abused the taxpayer and spent money like a drunken sailor.\n\nThose days have come…',
'Download the @Grok app',
'RT @SERobinsonJr: Cybertruck via Cybertunnel https://t.co/rYI4GkgI1e',
'RT @teslaeurope: Model 3 comes with lots of the same improvements that you love about New Model Y\n\nAnd starts at ~40,000 EUR in many countr…',
'RT @RapidResponse47: US Manufacturing Expands For Second Month Under Trump, Driven by Stronger Demand and Policy Shifts https://t.co/R7YtjE…',
'Grok successfully predicted all Oscar winners!\n\nDownload the @Grok app and try voice mode!',
'Shady',
'RT @WallStreetMav: DOGE has become one of the most popular aspects of the Trump Presidency.\n\nIn order to make the changes long term, it nee…',
'RT @DC_Draino: DOGE may have uncovered over $1 Trillion in Social Security fraud?!\n\nOver 73% of Americans approve of what DOGE is doing b/c…',
'RT @libsoftiktok: AOC lies claiming that the American people "vehemently opposed" to Elon cutting waste, fraud, and abuse from the federal…',
'RT @BasedMikeLee: Judges aren't presidents \n\nIf they want to be they can run for that office\n\nIt's fine to be a judge \n\nOr a president \n\nBu…',
'RT @DefiyantlyFree: Nancy Mace slams the left for being upset that DOGE and Elon Musk are finding 4 billion dollars a day in waste, fraud,…',
'RT @charliekirk11: The Democrat exodus didn't stop in November. @MichaelPruser has been giving updates on voter registration at the state l…',
'Improved efficiency',
'RT @TheRabbitHole84: I'm hoping Trump mentions DOGE and cost cutting efforts for streamlining the government. Given that the United States…',
'The Tesla team did a great job clearing out the broken conveyor system within 48 hours!',
'Still very few people know about this',
'A senior exec at Tesla sent me some funny pics from days in the factory where I was trying to show the construction team day shift what equipment wasn't working and needed to be removed.\n\nSo, I spray-painted stick figures on them 😂 https://t.co/ZWoE2yvVs2',
'RT @DonaldJTrumpJr: Instant classic.',
'Imagine if that were to happen … oh it already has',
'RT @PressSec: Remember when Joe Biden and Democrats said they needed a border bill to secure the border?\n\nPresident Trump did this in four…',
'RT @cb_doge: BREAKING: In just 6 weeks, DOGE has saved American taxpayers ~$105 billion! https://t.co/9j7p4hqvZe',
'Zelensky wants a forever war, a never-ending graft meat grinder. This is evil.',
'A senior exec at Tesla sent me some funny pics from days in the factory where I was trying to show the construction team day shift what equipment wasn't working and needed to be removed.\n\nSo, I spray-painted stick figures on them 😂 https://t.co/ZWoE2yvVs2',
'Starship is the first rocket/spaceship capable of making life multiplanetary, which requires it to be both far more powerful and far more advanced than anything that came before.',
"RT @CodeByPoonam: Grok 3 Voice Mode just dropped and it's INSANE\n\nEveryone on X is going crazy over its capabilities.\n\nHere are 7 wild exam…",
"RT @davepl1968: #Grok3 just blew my mind. \n\nI'm attempting to set up (partition and format) an old SCSI drive on a 1980s PDP-11/73 connect…",
"RT @FoxNews: 'Reagan' screenwriter claims Oscars' DEI requirements excluded film from Best Picture consideration https://t.co/SICeIS2nw2",
'RT @cb_doge: "Each Raptor rocket engine produces twice as much thrust as all 4 engines on a 747. There are 33 Raptor engines powering the S…',

'RT @RapidResponse47: .@SecRubio: "The sooner everyone grows up around here and figures out that this is a bad war that\'s heading in a bad d…',
 'RT @Sadie_NC: The guy has time during a war to shoot a Vogue cover. This should tell you all you need to know about what is really going on…',
 'Yes',
 'RT @TheChiefNerd: I tested uploading multiple sets of bloodwork to @grok tonight and just WOW!! It not only explained the results but also…',
 'RT @thecoercednurse: 🤯 I wanted to see how @grok would analyze some of my medical imaging. I pulled a couple screen shots and asked, no med…',
 'RT @MarioNawfal: ELON: I'M JUST TRYING TO KEEP CIVILIZATION GOING\n\nJoe Rogan: \n\n"What kind of responsibility do you feel, knowing that if y…',
 'RT @MarioNawfal: US MEDIA TRUST HITS ALL-TIME LOW: ONLY 31% OF AMERICANS STILL BELIEVE\n\nTrust in mass media has cratered to its lowest poin…',
 'RT @TheChiefNerd: MEGYN KELLY: "Last month on [CNN's] YouTube feed, they had 155M views and we were 147M … Just me and my six producers ver…',
 'RT @GadSaad: 100-fold greater.',
 'Wow',
 'RT @cb_doge: All 7 Starship Launches\n\n https://t.co/psGsPgzwWG',
 'Deservedly so',
 'RT @SpaceX: Falcon 9 delivers 21 @Starlink satellites to the constellation from Florida https://t.co/6PMELtitXj',
 "RT @SecRubio: Being a peacemaker is not a bad thing. We should be applauding and supporting @POTUS's efforts to bring about peace. https://…",
 'RT @cb_doge: Just a reminder:\n\nGrok has its own dedicated app — Try it out!\n\n https://t.co/vV868HzwCC',
 'RT @MarioNawfal: GROK 3 BUILT ANOTHER MULTIPLAYER GAME—NO HUMAN NEEDED\n\nA full game, written in Python, developed almost entirely by Cursor…',
 'Yeah, it's awesome!\n\nFor a wild experience, try Grok unhinged mode 😂\n\nNote, you have to download the @Grok app for this.',
 'Wow, this is cool',
 'Yes',
 'The Fed is absurdly overstaffed',
 'RT @MarioNawfal: 🚨 US REPORT: 7,000 POLITICALLY-CONNECTED NGOS HOARD 90% OF NONPROFIT FEDERAL FUNDING\n\nInvestigation reveals $300 billion i…',
 'Yes',
 'He's not wrong',
 'RT @ai_for_success: Grok-3 DeepSearch + Gamma : productivity hack 🔥 \n\n- Grok-3: DeepSearch is really powerful use it to pull relevant data…',
 'True',
 'Well said',
 'RT @nicksortor: 🚨 NOW: President Trump, Elon Musk, Lil X, and Ms. @MayeMusk just arrived at the White House on Marine One\n\nBIG WEEK AHEAD!…',
 'RT @johnkrausphotos: Starship, the largest and most powerful rocket in history, stands at Starbase, Texas, ahead of Flight 8 tomorrow https…',
 'This is messed up. Should just be who is best, not best with an asterisk!',
 'True',
 'So many cases of software licenses and media subscriptions with zero usage!\n\nEvery part of the government has this issue. @DOGE has yet to find an exception.',
 'Cool ❤️',
 'The American people like what they see',
 'RT @Tesla: Also comes in handy when car camping in areas with no cell service, so you can adjust climate or other settings without having t…',
 'RT @cb_doge: Elon Musk, wearing two hats — one photo from when he was 17 and the other from today. https://t.co/eGvSXrI0Rx',
 'RT @teslaownersSV: If US sinks, we all sink\n\nElon Musk https://t.co/mAXHvxFTTN',
 'Lot to learn on this flight',
 'America should be a DEMOcracy, not a BUREAUcracy! USUS\n https://t.co/SHpuaPyjRi',

'RT @SecDef: The President's desire to end the bloodshed in Ukraine will not be deterred. https://t.co/0B1RJzZ5vV',
'So good to see the improved forward flaps',
'RT @PlanetOfMemes: @MarioNawfal Yep. https://t.co/KzFbGgxFmo',
'Exactly',
'Starship flight test 8 tomorrow evening',
'RT @edwards345: This is one of the coolest videos I've ever seen. Please enjoy it while it is still novel. Soon this will become as common…',
'RT @MargoMartin47: President @realDonaldTrump and @elonmusk stop by an event at Mar-a-Lago 🇺🇸 https://t.co/dj5UuyhJsW',
'Much appreciated @SecDef Hegseth! \n🫡 🇺🇸\n https://t.co/Ll3ctnoLlx',
'Power to the people!',
'RT @WallStreetApes: Joe Rogan made it clear during his interview with Elon Musk: If you oppose DOGE, you fell for the propaganda\n\n"That's t…',
'Exactly',
'RT @SpeakerJohnson: I've attended many bilateral meetings with heads of state and dignitaries, but I've never seen anything like President…',
'Listen to this \n https://t.co/9MEWR8kyEF',
'RT @RapidResponse47: .@SecScottBessent: What I find interesting is, for the past year and a half... most of the media said, "Oh, the econom…',
'Of course',
'This is a real video of a past @SpaceX Starship water landing. \n\nTrying again tomorrow. \n\nWe need to perfect ship reentry at extreme temperatures before attempting to catch the ship with the tower arms, like the booster. \n\n https://t.co/tss9Lb4fWr',
"RT @NielsMache: Just unpacked Starlink Mini in northern Italy. The amazingly compact antenna is pretty fast. Starlink's internet speed is e…",
'RT @Starlink: Starlink Mini is compact, portable and connects in minutes 🛰️ ',
"RT @johnkrausphotos: Ship 34 is rolling to the launch site at Starbase ahead of tomorrow's launch of Starship Flight 8 https://t.co/xKztfar…",
"RT @ggreenwald: It's so easy to sit in European capitals or nice US TV studios and cheer war in Ukraine all to derive a feeling of purpose…",
'RT @cb_doge: It's not about Ukraine.\n\nIt's not about Russia.\n\nIt's not about the United States.\n\nIt's about human lives. This war must end.',
'RT @Sadie_NC: Still think there is no media bias? https://t.co/XZpYyO0Ynw',
'RT @MarioNawfal: 🚨🇺🇸BRENDAN CARR: WE ARE COMING OUT OF A PERIOD OF WEAPONIZATION AT THE FCC\n\n"Your last name dictated the FCC's treatment.…',
'It's a deliberate strategy',
'RT @TheCaptainEli: I support Elon Musk !\n\nAsking people in Israel what they are thinking of Elon Musk\nVideo #1 https://t.co/ChqLIqiT9z',
'RT @TheCaptainEli: I support Elon Musk !\n\nAsking people in Israel what they are thinking of Elon Musk\nVideo #2 https://t.co/X1M1DRQbKQ',
'Big difference if it's not you or your child being conscripted to die in trenches',
'Masa is already overleveraged',
'The EU leaders and Zelensky having fancy dinners while men die in trenches. \n\nHow many parents will never see their son again? \n\nHow many children will never see their father?',
'RT @WallStreetMav: Hypocrisy lvl 1000 https://t.co/3uPXyJybKV',
'Leaders and diplomats enjoy Michelin-starred meals, while soldiers die in trenches',
'Send friends links to 𝕏 posts so they know what's really going on!',
'The authorities need to stop doing this',
'Cool idea. \n\nStarfleet Academy has a nicer ring to it though. \n\nCould still cover space/AI/robotics.',
'The reality of war https://t.co/APwT3ToL1k',
'Exactly',
'The reality of war https://t.co/APwT3ToL1k',
'RT @lexfridman: We need to invest in peace not war.\n\nWe need to invest in innovation, in our education system, and in building epic things…',

'RT @newstart_2024: Elon Musk: "At the heart of the sort of like, why is the Democrat propaganda machine so fired up to destroy me? That\'s t…',
'RT @RepThomasMassie: NATO is a Cold War relic that needs to be relegated to a talking kiosk at the Smithsonian.',
'Not much has changed',
'RT @EndWokeness: FBI Director Kash Patel wants to know what happened to all the $$ we gave Ukraine https://t.co/3t8TwkNH7s',
'Yeah',
'Thank you!',
'What I said over 2 years ago was that Ukraine should seek peace or suffer severe loss of life for no gains. \n\nThe latter was Zelensky's choice. \n\nNow, he wants to do that again. \n\nThis is cruel and inhumane.',
'RT @MarioNawfal: ELON: DOGE HAS PUSHED TO HIRE, NOT FIRE AIR TRAFFIC CONTROLLERS\n\n"There is a shortage of top notch air traffic controllers…',
'RT @cb_doge: BREAKING: ~73% of Americans approve of the Department of Government Efficiency. us https://t.co/XYJVPA4RKt',
'RT @teslaownersSV: "The vast majority of diseases or brain issues, I think are fixable with a Neuralink device."\n\nElon Musk\n https://t.co/F…',
'RT @liz_churchill10: This brings me so much joy 🔥 https://t.co/jodG2NMf8d',
'(True, although I would never wear Crocs) \n https://t.co/iRjqjZBbQn',
'RT @WallStreetMav: Approximately 73% of Americans approve of Doge!! \n\nThe Doge Act is not a bill yet, but it's coming soon. The goal of th…',
'Yeah',
'Grok can save you from scams!',
'RT @MarioNawfal: usua BIDEN TOLD ZELENSKY TO BE GRATEFUL FOR U.S. AID?!\n\nTurns out, Trump isn't the only U.S. president to lose his patienc…',
'RT @bennyjohnson: 🚨🔥Stephen Miller just hit the nail on the HEAD: \n\n"President Trump defended Americans after YEARS of being fleeced and a…',
'Same',
'RT @BalazsOrban_HU: Dear European "leaders", although Hungary has been the only country that has consistanly stood for peace in the EU, we…',
'Yes',
'Zelensky damaged himself severely in the eyes of the public. Just a fact.',
'RT @cb_doge: That little blue dot is us. https://t.co/G775HRHlbM',
'RT @TRHLofficial: I miss the anti-war left.',
'RT @DimaZeniuk: One day humanity will be on Mars https://t.co/YIUmFBmoJy',
'RT @MarioNawfal: ELON'S BEST MOMENTS ON JOE ROGAN - A THREAD\n\nElon was on Joe Rogan again, and the conversation was as entertaining as you'…',
'RT @teslaownersSV: The scale of the Starship is insane and 🤯🤯🤯 https://t.co/6k9Ky0ZPMZ',
'Yes',
'RT @johnkrausphotos: Good evening from Starbase, Texas, where Starlink satellite simulators are being loaded onto Ship 34 ahead of Starship…',
'RT @teslaownersSV: Grok 3 images are insanely real 🤯🤯 https://t.co/05XdCtpdk0',
'RT @TheRabbitHole84: AP used to be regarded as being more in the center but is now rated as having a Left-wing bias. https://t.co/ii15Ga8L1a',
'Yes',
'RT @WallStreetApes: Elon Musk talks about California's HORRIBLE leadership during his Joe Rogan interview\n\nElon Musk explains how Democrats…',
'RT @AMErikaNGIRLLL: "Europe is going to have to pay \nto defend itself!" 💥 https://t.co/wrNA0FsRYp',
'RT @stillgray: Ukraine. https://t.co/ZAZiATPhLo',
'I agree',
'RT @waitbutwhy: Facebook = Caramel popcorn\n\nInstagram = Twinkie\n\nX = peanut butter filled pretzel nuggets. Also mediocre-tasting and makes…',
'Currently reading https://t.co/iHYnrcQypO',
'RT @KanekoaTheGreat: Donald Trump and JD Vance are currently the most favorably viewed politicians in the United States, according to the m…',
"RT @MarioNawfal: 🚨12-HOUR NEWS RECAP\n\n1. usTrump to Zelensky: 'Come Back W

hen You're Ready for Peace' — Trump and Vance clashed with Zelens…",
 'When will social security run out of money, if nothing is fixed?\n https://t.
co/1dgiAlYYue',
 'RT @MarioNawfal: usELON: AP IS GUILTY OF MASSIVE MISINFORMATION\n\n"There's t
his massive standoff between AP and the White House press office…',
 "RT @niccruzpatane: If you are a $TSLA investor, or just a fan of Tesla and El
on, please listen to this.\n\nElon Musk: "I'm the same person I…",
 'RT @SecRubio: We should be very proud that we have a President whose prime ob
jective is not to get into wars but to prevent wars and to get…',
 'RT @niccruzpatane: The Tesla Model Y Is The Best-Selling Vehicle Worldwide In
2024 https://t.co/CG4TJgeAND',
 'RT @Rothmus: More. https://t.co/ojwgNuQcOD',
 'RT @DefiyantlyFree: Elon Musk is right NGOs are the biggest scam. They are ho
w the left transformed the world into the Truman show in just…',
 'It will require outstanding execution, but I think more like 1000% gain for T
esla in 5 years is possible',
 "RT @ai_for_success: Grok-3 image editing feature is really underrated. It's i
ncredibly good, you guys should try it out! It's free for ever…",
 'True',
 'Exactly',
 'RT @MarioNawfal: uaroBREAKING: USAID FUNDED NGO ACCUSED OF MEDDLING IN ROMANI
A'S ELECTIONS\n\nA Ukrainian state-funded group called TEXTY, wh…',
 'Prosperity is what happens when you cut government overspending and excess re
gulation!',
 'RT @USAEdMartin: Concerning. \nNo one is above the law.',
 'More of your tax dollars saved',
 'Crazy',
 'RT @cb_doge: "The Associated Press which I call Associated Propaganda, they r
an an international news story saying that the DOGE fired air…',
 'Teslas can even drive themselves on dirt roads with no markings',
 'RT @C__Herridge: EXCLUSIVE:\xa0Our full, unedited interview with Secretary of
State Marco Rubio(@SecRubio) on his first 30 days leading the De…',
 'RT @cb_doge: You can upload 4-hour videos on this platform!\n\nPerfect for lo
ng podcasts, movies, documentaries, short films— everything.\n\n h…',
 'The President has made it clear that this is mandatory for the executive bran
ch. \n\nAnyone working on classified or other sensitive matters is still requir
ed to respond if they receive the email, but can simply reply that their work i
s sensitive.',
 'Download the @Grok app!',
 'Yes',
 'Very important to understand the corruption machine \n https://t.co/EMrZCsBKi
I',
 "RT @MarioNawfal: ELON: I THINK WE'LL ACHIEVE FULL AND RAPID REUSABILITY OF ST
ARSHIP IN 2026\n\n"We're pretty close to being able to rapidly r…",
 'Reducing fraud & waste of your tax dollars by a trillion dollars in 2026
is possible',
 'RT @BGatesIsaPyscho: Just like Covid - The Globalist Deep State Puppet Leader
s all have the same pre-scripted message 👇 https://t.co/S8YcGd…',
 'RT @AutismCapital: 🚨JOE ROGAN: "What is it like to buy a company for $44B an
d then people call you a Nazi on the platform you just bought?"…',
 'RT @Inevitablewest: 🚨BREAKING: Donald Trump confronted Starmer for removing
security elements on Apple devices:\n\n"We told him you can't do…',
 'RT @DefiyantlyFree: Bill Clinton fired 377,000 federal employees. Did you hea
r a peep from the media no? Because this is your daily reminde…',
 'RT @levie: After well over a hundred years of incremental progress, all of a
sudden transportation is going to change very quickly https://…',
 'Interesting book',
 'The @Grok doc',
 'RT @MarioNawfal: 🚨usELON: LEGACY MEDIA CREATE AN ALTERNATE REALITY\n\n"The m
edia is incredibly partisan. \n\nAlmost all the media is left-shift…',

'RT @thatsKAIZEN: Think Trump was aggressive to Zelenskyy for no reason?\n\nWatch the whole talk.\n\nTimestamps below.\n\nZelenskyy was emotional.…',
'RT @fentasyl: I am quite happy I dedicated 15 months of my life to non-stop posting hard data & original analysis about illegal immigration.',
'RT @america: Elon Musk: "Our elected officials have very little power relative to the bureaucracy until DOGE… DOGE is the first threat to t…',
'That's how it works',
'There is a good chance of achieving full reusability of Starship this year.\n\nFull and immediate reflight of Starship, along with orbital refilling, probably happens next year. \n\nThis is the fundamental breakthrough needed to make life multiplanetary.',
'So natural and organic 🙄',
'Time to find out what really happened to the hundreds of billions of dollars sent to Ukraine …',
'RT @SpeakerJohnson: Thanks to President Trump - the days of America being taken advantage of and disrespected are OVER. \n\nThe death and des…',
'RT @AutismCapital: 🚨 ELON MUSK: "There are 10,000s of Federal Employees that already have access to the (IRS) systems. Anyone from DOGE has…',
'This is a very big deal',
'Send people links from 𝕏, so they know what's really going on!',
'Very expensive gym membership!',
'They are still trying to do this. The closer you look, the more horrified you will be.',
'Biggest scam ever',
'RT @KanekoaTheGreat: NEW: Elon Musk and Joe Rogan discuss George Soros and the multi-billion dollar fraud of government-funded non-governme…',
'That's the situation',
'Restore POWER to the PEOPLE!!\n https://t.co/WsVYYt1tv6',
'Starlink now connects over 5M people in 125 countries!',
'RT @nicksortor: 🚨 WOW! Zelensky behaved SO BADLY in the Oval Office that he even lost Lindsey Graham\n\n"Americans witnessing this would not…',
'RT @SecScottBessent: Thank you, President Trump, for standing up for the American people and our nation on the global stage.',
"RT @KanekoaTheGreat: Legacy media: RFK's measles outbreak!\n\nMeasles: https://t.co/ErZc8Svd98",
'Why do the governments not respond to their people?',
'RT @PressSec: President Trump and Vice President Vance are standing up for the American people.',
'Trending well',
'President @realDonaldTrump is the Commander-in-Chief\n https://t.co/O91xt4bm1t',
'Watch this carefully. Very important. \n https://t.co/wdM3XdbrH1',
'Accurate',
'RT @MarioNawfal: 🚨 usHEATED EXCHANGE BETWEEN TRUMP, VANCE, AND ZELENSKY\n\nTrump: "You\'re not winning this...you have to be thankful...we gave…',
'RT @MarioNawfal: 🚨 TRUMP TO ZELENSKY: YOU HAVE TO BE MORE THANKFUL\n\n"I gave you the Javelins to take out all those tanks. Obama gave you she…',
'RT @MarioNawfal: 🚨 VANCE TO ZELENSKY: YOU'RE DISRESPECTFUL FOR ATTACKING THIS ADMINISTRATION\n\nTrump to Zelensky: "Don't tell us what we're g…',
'Keynes was a great evil',
'Logical',
'RT @KanekoaTheGreat: President Trump: "I hope I will be remembered as a peacemaker... I\'m doing this to save lives more than anything else.…',
'Mars probably had liquid oceans a long time ago, before it cooled. Now, there are vast fields of ice covered by red dust. \n\nIf we warm up the planet, the oceans will return and the atmosphere will densify, making it possible to extend life to Mars.',
'RT @visegrad24: BREAKING:\n\nTrump says Ukraine has brave soldiers.\n\n"I give tremendous credit to your generals, your soldiers & yourself (…)…',
'Cool!\n\nOnly gets better from here.',

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 'Troll radical left Reddit by saying nice things about me for the most fun
😂',
 'Fun mission',
 '"All dressed up today" 😂',
 'RT @MarioNawfal: 🚨 FɾLEFT-WING PARIS THEATRE FACES BANKRUPTCY AS MIGRANTS REF
USE TO LEAVE, SEXUAL VIOLENCE SOARS\n\nThe left-wing managers of…',
 'A more accurate measure of GDP would exclude government spending.\n\nOtherwis
e, you can scale GDP artificially high by spending money on things that don't m
ake people's lives better. \n\nFor example, you could shift everyone who is bui
lding cars to working at the DMV. That would',
 'RT @WR4NYGov: When my cousin called Elon an "ersatz Nazi" I kinda lost it:\n
\nWhy would a Nazi:\nSupport israel\nHire ethnically diverse teams…',
 'RT @MatchasmMatt: Probably nothing... https://t.co/eF1IwK18vJ',
 'True',
 "RT @DirtyTesLa: 1 year ago today @WifeDirtyTesla and I picked up our Cybertru
ck! Insane it's already been a year. Best vehicle ever. https:…",
 'RT @EndWokeness: National debt, 1960: $286 billion\nNational debt, 2025: $36.
2 TRILLION\n\nAre our communities safer?\nIs it easier to raise a…',
 'Yeah',
 'RT @MarioNawfal: ELON: DOGE IS 100% TRANSPARENT\n\n"When people criticize wha
t DOGE is doing, we say which part, specifically?\xa0\n\nBecause we p…',
 'What fixing government computer systems feels like https://t.co/Up6lpAEJU5',
 'Bravo!',
 'RT @MikeBenzCyber: So many ironies here showing just how useless and out of d
ate Jon Stewart is. Not only is this exactly what USAID does,…',
 'True',
 'RT @cybertruck: The only pickup truck with FSD Supervised \n\nPick a destinat
ion &amp; your Cybertruck will drive you there',
 'Extremely fundamental to your freedom',
 'RT @matt_vanswol: I'm angry this morning.\n\nI feel like I've just woken up f
rom a dream where everything I thought I knew about good and evi…',
 "RT @Sadie_NC: I think it speaks volumes that you don't hear any Democrats com
ing out against the attacks on Tesla dealerships and Tesla own…",
 'RT @Scobleizer: Tesla is in a free fall. \n\nIts products are getting attacke
d.\n\nIts customers are getting mocked. Flipped off, and worse.\n\nT…',
 'Much appreciated @SeanHannity!\n https://t.co/8EETkPHky1',
 "RT @MarioNawfal: 🚨 US CNN ANCHOR LEFT SPEECHLESS AS MAJORITY OF AMERICANS BA
CK ELON'S GOVERNMENT CUTS\n\nCNN's Harry Enten couldn't hide his…",
 'RT @RapidResponse47: .@VP: The U.S. unfortunately made it way too easy for pe
ople to compete against Amercian citizens for the precious hom…',
 'RT @GigaBasedDad: Are you paying attention yet? https://t.co/QD5QgvIRev',
 'RT @WallStreetApes: Elon Musk explains the NGO Scam\n\n"The government-funded
NGOs are a way to do things that would be illegal if they were…']
```

In [187…
```python
#Creating the TF-IDF vectorizer to get sop_words
def create_stop_words_tfid(text:list)-> pd.DataFrame:
    tfidf_vectorizer = TfidfVectorizer()
    tfidf_vectorizer_vectors = tfidf_vectorizer.fit_transform(text)
    tfidf_df = pd.DataFrame(tfidf_vectorizer_vectors.toarray(), columns=tfidf_ve

    #Calculating the average score for each word(axis=0->per word )
    tfidf_scores = tfidf_df.mean(axis=0).reset_index()
    tfidf_scores.columns = ['word', 'tfidf_score']

    #Sort by TF-IDF score
    tfidf_scores = tfidf_scores.sort_values(by="tfidf_score", ascending=False)

    return tfidf_scores
```

In [188…
```python
stop_words_tfidf = create_stop_words_tfid(text)
print(stop_words_tfidf.head(10))
```

```
        word   tfidf_score
2563     the      0.047858
2214      rt      0.040086
2612      to      0.037016
1268   https      0.032376
527       co      0.031339
1375      is      0.029565
1803      of      0.028686
2923     yes      0.026158
1318      in      0.023849
212      and      0.023795
```

In [ ]:
```python
#Show the whole df with stop wrods
with pd.option_context("display.max_rows", None,):
    print(stop_words_tfidf)
```

In [190…
```python
#Removing rows based on condition for TF-IDF score
score = 0.01
stop_words_defined = stop_words_tfidf[stop_words_tfidf["tfidf_score"] >= score]
stop_words_defined
```

Out[190…

	word	tfidf_score
2563	the	0.047858
2214	rt	0.040086
2612	to	0.037016
1268	https	0.032376
527	co	0.031339
1375	is	0.029565
1803	of	0.028686
2923	yes	0.026158
1318	in	0.023849
212	and	0.023795
2663	true	0.022731
2588	this	0.019590
2899	wow	0.018493
1050	for	0.018191
1382	it	0.018033
853	elon	0.017128
2929	you	0.016682
245	are	0.016316
2561	that	0.015502
1820	on	0.015105
2819	we	0.014052
1727	musk	0.012618
2666	trump	0.012394
594	cool	0.012263
1426	just	0.012043
780	doge	0.011860
1156	grok	0.011592
1983	president	0.011249
2842	what	0.011193
316	be	0.011169
2582	they	0.010988
1911	people	0.010671
929	exactly	0.010603

	word	tfidf_score
1599	marionawfal	0.010469
1781	not	0.010370
1194	has	0.010085

In [192…

```python
#Creating a new dataframe with own stop words romoved
sentiment_analysis_df_copy = sentiment_analysis_df.copy()
sentiment_analysis_2_df = remove_stop_words(sentiment_analysis_df_copy, stop_wor
sentiment_analysis_2_df = sentiment_analysis_2_df[sentiment_analysis_2_df["text_
sentiment_analysis_2_df
```

Out[192…

	text	text_cleaned
1	RT @Starlink: Starlink Mini enables high-speed…	starlink mini enables high speed internet go
3	RT @teslaownersSV: SpaceX is making fully rapi…	spacex making fully rapidly reusable rockets h…
4	RT @iam_smx: Elon Musk and his, Son Lil X are …	his son lil x inseparable hi
7	Actual public support for @DOGE is super high!	actual public support super high
8	RT @cb_doge: 🚨 KUDLOW: "Everyone is trying to …	kudlow everyone trying drive wedge between i d…
…	…	…
14	Much appreciated @SeanHannity!\n https://t.co/…	much appreciated
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE…	cnn anchor left speechless majority americans …
17	RT @RapidResponse47: .@VP: The U.S. unfortunat…	u s unfortunately made way easy compete agains…
18	RT @GigaBasedDad: Are you paying attention yet…	paying attention yet
19	RT @WallStreetApes: Elon Musk explains the NGO…	explains ngo scam government funded ngos way d…

658 rows × 2 columns

The last process is lemmetization. It stems from the word lemmatize, which means reducing the different forms of a word to one single form. Lemmatization has a pre-defined dictionary that stores the context of words and checks the word in the dictionary while shrinking the word.

In [241…

```python
def lemmatize(df: pd.DataFrame) -> pd.DataFrame:
    lemmatizer = WordNetLemmatizer()

    def lemmatize_each_row(text: str) -> str:
```

```
        words = text.split()
        lemmatized_words = [lemmatizer.lemmatize(word) for word in words]

        return " ".join(lemmatized_words)

    df["text_cleaned"] = df["text_cleaned"].apply(lemmatize_each_row)

    return df
```

In [243...
```
sentiment_analysis_2_df = lemmatize(sentiment_analysis_2_df)
sentiment_analysis_df = lemmatize(sentiment_analysis_df)
```

Now moving onto the models itself. Using both of these datasets to determine which model is better given the circumstances, data and preprocessing.

The Vader sentiment analysis scores the text/tweet with three scores positve, negative, neutral. For each of these it returns a value. Then later with condition we will add sentiment label based on the score.

In [ ]:
```
#Creating the VADER sentiment anylzer (part of NLTK library)
analyzer = SentimentIntensityAnalyzer()

#Getting the sentiment values for each tweet
sentiment_analysis_2_df["vader_sentiment"] = sentiment_analysis_2_df["text_clean
sentiment_analysis_df["vader_sentiment"] = sentiment_analysis_df["text_cleaned"]

#Adding label of "POS, NEG or NEU" for polarity scores
```

Out[ ]:

	text	text_cleaned	vader_sentiment
1	RT @Starlink: Starlink Mini enables high-speed...	starlink mini enables high speed internet go	0.0000
3	RT @teslaownersSV: SpaceX is making fully rapi...	spacex making fully rapidly reusable rocket ho...	0.0000
4	RT @iam_smx: Elon Musk and his, Son Lil X are ...	his son lil x inseparable hi	0.0000
7	Actual public support for @DOGE is super high!	actual public support super high	0.7650
8	RT @cb_doge: 🚨 KUDLOW: "Everyone is trying to ...	kudlow everyone trying drive wedge between i d...	0.4939
...	...	...	...
14	Much appreciated @SeanHannity!\n https://t.co/...	much appreciated	0.5106
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...	cnn anchor left speechless majority american b...	-0.4215
17	RT @RapidResponse47: .@VP: The U.S. unfortunat...	u s unfortunately made way easy compete agains...	0.6369
18	RT @GigaBasedDad: Are you paying attention yet...	paying attention yet	0.0000
19	RT @WallStreetApes: Elon Musk explains the NGO...	explains ngo scam government funded ngo way do...	-0.8074

658 rows × 3 columns

In [251...

```python
def label_sentiment(score:int)-> str:
    if score >= 0.05:
        return 'POS'
    elif score <= -0.05:
        return 'NEG'
    else:
        return 'NEU'

sentiment_analysis_2_df["vader_label"] = sentiment_analysis_2_df["vader_sentimen
sentiment_analysis_df["vader_label"] = sentiment_analysis_df["vader_sentiment"].

sentiment_analysis_2_df
```

Out[251...

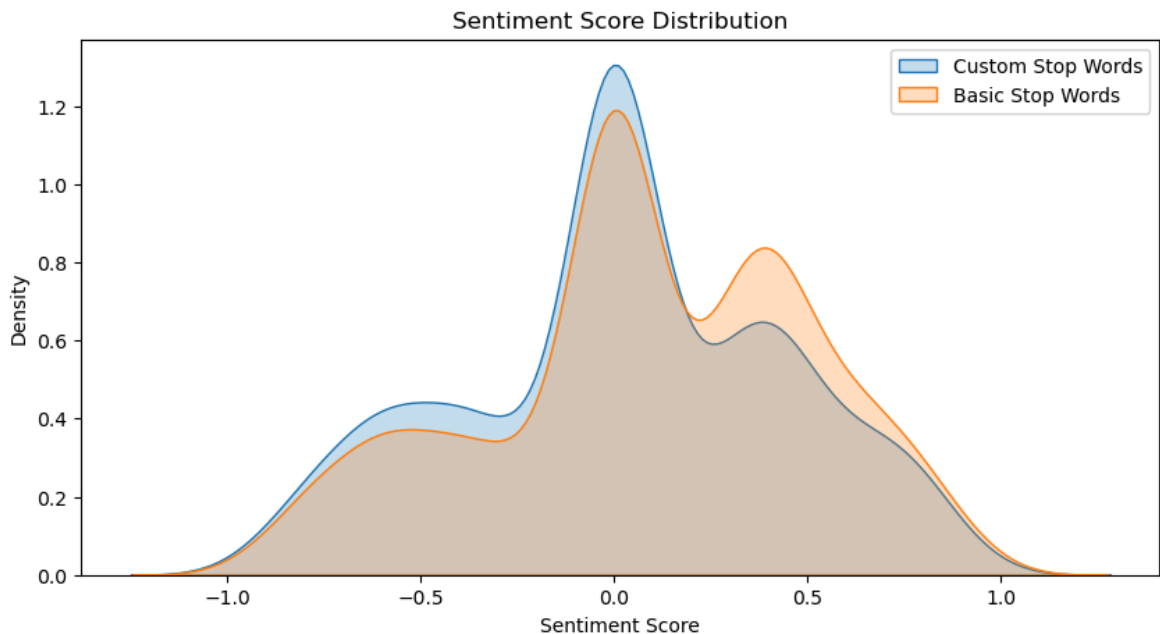|	text	text_cleaned	vader_sentiment	vader_label
1	RT @Starlink: Starlink Mini enables high-speed...	starlink mini enables high speed internet go	0.0000	NEU
3	RT @teslaownersSV: SpaceX is making fully rapi...	spacex making fully rapidly reusable rocket ho...	0.0000	NEU
4	RT @iam_smx: Elon Musk and his, Son Lil X are ...	his son lil x inseparable hi	0.0000	NEU
7	Actual public support for @DOGE is super high!	actual public support super high	0.7650	POS
8	RT @cb_doge: 🚨 KUDLOW: "Everyone is trying to ...	kudlow everyone trying drive wedge between i d...	0.4939	POS
...	...	...	...	...
14	Much appreciated @SeanHannity!\n https://t.co/...	much appreciated	0.5106	POS
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...	cnn anchor left speechless majority american b...	-0.4215	NEG
17	RT @RapidResponse47: .@VP: The U.S. unfortunat...	u s unfortunately made way easy compete agains...	0.6369	POS
18	RT @GigaBasedDad: Are you paying attention yet...	paying attention yet	0.0000	NEU
19	RT @WallStreetApes: Elon Musk explains the NGO...	explains ngo scam government funded ngo way do...	-0.8074	NEG

658 rows × 4 columns

Since for these data there are no ground truth labels for evalution matrix. There are only typical statiscal evaluations we can do on these model to see how have they behaved. What I will present with commentary is compare distribution of sentiment scores, compare mean and standard deviation of sentiment scores, statistical test - T-test paired. With these we can get clear idea how these two models behave.

In [255...

```python
#Comparing distribution of sentiment scores
import seaborn as sns
import matplotlib.pyplot as plt

plt.figure(figsize=(10,5))
sns.kdeplot(sentiment_analysis_2_df['vader_sentiment'], label='Custom Stop Words
sns.kdeplot(sentiment_analysis_df['vader_sentiment'], label='Basic Stop Words',
plt.legend()
plt.title('Sentiment Score Distribution')
plt.xlabel('Sentiment Score')
```

```
plt.ylabel('Density')
plt.show()
```

Sentiment Score Distribution

As we can see in the graph above both custom and basic stop words data show a peak around 0. Meaning that most of the tweets are labeled as neutral, but data with a custom stop word list (from TF-IDF) has a higher peak. This could be interpreted as the basic stop words list removing words that could influence the sensitivity analysis so that it would label it as neutral. The same for the left side of the graph. On the other hand, both models show a slight bias towards the positivity label as there is a slight peak but bigger for the basic stop word list. This shows that the opposite is happening here where the custom stop word list is removing stop words that could influence labeling tweet as positive.

```
In [ ]:   #Compare mean and standard deviation of sentiment scores
          print("Mean sentiment score for custom stop word list is:", sentiment_analysis_2
          print("Standard deviation for custom stop word list is:", sentiment_analysis_2_d

          print("Mean sentiment score for basic stop word list is:", sentiment_analysis_df
          print("Standard deviation for basic stop word list is:", sentiment_analysis_df['
```

```
Mean sentiment score for custom stop word list is: 0.027297568389057753
Standard deviation for custom stop word list is: 0.42037737977301454
Mean sentiment score for basic stop word list is: 0.08368085991678224
Standard deviation for basic stop word list is: 0.42259936644774665
```

With these scores and graph, we can say that the custom stop word model is indeed more neutral as the score 0.27 is closer to 0 and the basic stop word list is 0.084 closer to 1 showing the bias towards right so positive sentiment. So the basic leans more toward positive sentiment and the basic leans toward neutral. Also with standard deviation identical when rounded to 2 decimal places being 0.42. This shows that the spread of labels/sentiment is the same for 2 models. Neither model introduces a significant change to the results.

```
In [264…   #T-test paired
           import scipy.stats as stats
```

```
t_test, p_value=stats.ttest_ind(sentiment_analysis_df["vader_sentiment"],sentime
print("The result of paired t-test is:",t_test)
print("The p-value is:",p_value)
```

```
The result of paired t-test is: 2.4814987907141597
The p-value is: 0.013202581643022519
```

For the statistical paired t-test (Welch´s test) we work with two hypotheses. H0: μ_basic = μ_custom H1: μ_basic != μ_custom This means that the null hypothesis H0 is rejected and the results of sentiments are statistically different because p_value 0.013 is lower than 0.05 which is alfa or b so-called significance level. This also is supported by the difference means each model has resp. 0.084 and 0.027.

The results are clear. There is a significant difference between these two models and their scores. Each stop word set influences the score in a way thus it is one of the crucial parts in this analysis. But if I had to choose I would prefer the custom stop word list based on the TF-IDF method which is also supported in the journal article Saif et al.(2014) On Stopwords, Filtering and Data Sparsity for Sentiment Analysis of Twitter Hassan Saif, Miriam Fernandez, Yulan He, Harith Alani.

Now for the second model the BERT model which is machine learning model and should provide more insight than rule based model such as VADER. This class provides functionality to tokenize text data using a pre-trained BERT tokenizer bert-base-uncased.

In [ ]:
```python
#Creating BERT tokenizer
tokenizer = BertTokenizer.from_pretrained("bert-base-uncased")

def tokenize_text(df: pd.DataFrame)->pd.DataFrame:
    tokenized_text = df["text_cleaned"].apply(lambda x: tokenizer(x, padding=Tru

    #Extract each row so that it is not list of lists
    df[""] = tokenized_text.apply(lambda x: x[""].squeeze().tolist())
    df["attention_mask"] = tokenized_text.apply(lambda x: x["attention_mask"].sq
    df["token_type_ids"] = tokenized_text.apply(lambda x: x["token_type_ids"].sq

    return df
```

In [ ]:
```python
tweet = "I absolutely love this new phone! #excited"
tokenizer = BertTokenizer.from_pretrained("bert-base-uncased")
# Tokenize the tweet
encoded_input = tokenizer(tweet, return_tensors='pt', padding=True, truncation=T


# View the tokenized output
print(encoded_input)
```

```
{'input_ids': tensor([[ 101, 1045, 7078, 2293, 2023, 2047, 3042,  999, 1001, 756
8,  102]]), 'token_type_ids': tensor([[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]]), 'atten
tion_mask': tensor([[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]])}
```

In [292…
```python
tokenized_sentiment_analysis = tokenize_text(sentiment_analysis_df)
tokenized_sentiment_analysis_2 = tokenize_text(sentiment_analysis_2_df)
```

In [293…
```python
print(tokenized_sentiment_analysis.head())
```

```
                                                                text  \
0                                                                Yes
1  RT @Starlink: Starlink Mini enables high-speed...
3  RT @teslaownersSV: SpaceX is making fully rapi...
4  RT @iam_smx: Elon Musk and his, Son Lil X are ...
7      Actual public support for @DOGE is super high!


                                         text_cleaned  vader_sentiment  \
0                                                 yes           0.4019
1        starlink mini enables high speed internet go           0.0000
3  spacex making fully rapidly reusable rocket ho...           0.0000
4             elon musk his son lil x inseparable hi           0.0000
7                    actual public support super high           0.7650

  vader_label                                          input_ids  \
0         POS                                    [101, 2748, 102]
1         NEU  [101, 2732, 13767, 7163, 12939, 2152, 3177, 42...
3         NEU  [101, 2686, 2595, 2437, 3929, 5901, 2128, 1038...
4         NEU  [101, 3449, 2239, 14163, 6711, 2010, 2365, 134...
7         POS           [101, 5025, 2270, 2490, 3565, 2152, 102]

                               attention_mask  \
0                                    [1, 1, 1]
1                 [1, 1, 1, 1, 1, 1, 1, 1, 1, 1]
3  [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]
4      [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1]
7                          [1, 1, 1, 1, 1, 1, 1]

                               token_type_ids
0                                    [0, 0, 0]
1                 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
3  [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
4      [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
7                          [0, 0, 0, 0, 0, 0, 0]
```

Each dictionary contains tokenized information for one tweet, including:

input_ids - The list of token IDs corresponding to the tweet attention_mask - The mask indicates which tokens are actual words (1) and which are padding (0) padding is used so that each sequence that is processed has the same size. Also the .squeeze() method removes any dimensions of size 1 from the PyTorch tensor.

```
In [295…    tokenized_sentiment_analysis
```

Out[295…

	text	text_cleaned	vader_sentiment	vader_label	input_ids	attention_
0	Yes	yes	0.4019	POS	[101, 2748, 102]	[
1	RT @Starlink: Starlink Mini enables high-speed…	starlink mini enables high speed internet go	0.0000	NEU	[101, 2732, 13767, 7163, 12939, 2152, 3177, 42…	[1, 1, 1, 1,
3	RT @teslaownersSV: SpaceX is making fully rapi…	spacex making fully rapidly reusable rocket ho…	0.0000	NEU	[101, 2686, 2595, 2437, 3929, 5901, 2128, 1038…	[1, 1, 1, 1, 1, 1,
4	RT @iam_smx: Elon Musk and his, Son Lil X are …	elon musk his son lil x inseparable hi	0.0000	NEU	[101, 3449, 2239, 14163, 6711, 2010, 2365, 134…	[1, 1, 1, 1, 1, 1,
7	Actual public support for @DOGE is super high!	actual public support super high	0.7650	POS	[101, 5025, 2270, 2490, 3565, 2152, 102]	[1, 1, 1,
…	…	…	…	…	…	…
14	Much appreciated @SeanHannity!\n https://t.co/…	much appreciated	0.5106	POS	[101, 2172, 12315, 102]	[1,
15	RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE…	cnn anchor left speechless majority american b…	-0.4215	NEG	[101, 13229, 8133, 2187, 25146, 3484, 2137, 20…	[1, 1, 1, 1, 1, 1,

	text	text_cleaned	vader_sentiment	vader_label	input_ids	attention
17	RT @RapidResponse47: .@VP: The U.S. unfortunat...	u s unfortunately made way easy people compete...	0.6369	POS	[101, 1057, 1055, 6854, 2081, 2126, 3733, 2111...	[1, 1, 1, 1, 1, 1, 1,
18	RT @GigaBasedDad: Are you paying attention yet...	paying attention yet	0.0000	NEU	[101, 7079, 3086, 2664, 102]	[1, 1,
19	RT @WallStreetApes: Elon Musk explains the NGO...	elon musk explains ngo scam government funded ...	-0.8074	NEG	[101, 3449, 2239, 14163, 6711, 7607, 17895, 80...	[1, 1, 1, 1, 1, 1, 1,

721 rows × 7 columns

```
In [ ]: print(tokenized_sentiment_analysis.iloc[0])
```

```
text                            Yes
text_cleaned                    yes
vader_sentiment              0.4019
vader_label                     POS
input_ids            [101, 2748, 102]
attention_mask           [1, 1, 1]
token_type_ids           [0, 0, 0]
Name: 0, dtype: object
```

```
In [319…  #Extracting the tokenized information
          sentiment_analysis_df["input_ids"] = tokenized_sentiment_analysis.apply(lambda r
          sentiment_analysis_df["attention_mask"] = tokenized_sentiment_analysis.apply(lam
          sentiment_analysis_df["token_type_ids"] = tokenized_sentiment_analysis.apply(lam

          sentiment_analysis_2_df["input_ids"] = tokenized_sentiment_analysis_2.apply(lamb
          sentiment_analysis_2_df["attention_mask"] = tokenized_sentiment_analysis_2.apply
          sentiment_analysis_2_df["token_type_ids"] = tokenized_sentiment_analysis_2.apply
```

```
In [ ]: #Splitting the data fro training a testing
        X_train, X_test, y_train, y_test = train_test_split(sentiment_analysis_df[])
```

```
In [ ]: #Creating BERT model
        model = BertModel.from_pretrained("bert-base-uncased")
```

```
model.safetensors:    0%|            | 0.00/440M [00:00<?, ?B/s]
```

This function extracts the embeddings from a pre-trained BERT model for a given
tokenized input. Since the model is pre-trained there is no need to worry about the

model learning anything new from the first dataframe which is put through it. Extracting the embeddings of the [CLS] token, which is a special token added at the beginning of each input sequence in BERT for classification or other tasks and the [SEP] token marks the end of the input sequence.

```python
#Extracting embeddings
def get_embeddings(tokens):
    with torch.no_grad():
        outputs = model(input_ids=torch.tensor([tokens["input_ids"]]),
                        attention_mask=torch.tensor([tokens["attention_mask"]]),
                        token_type_ids=torch.tensor([tokens["token_type_ids"]])
        return outputs.last_hidden_state[:, 0, :].squeeze().numpy()

#Apply embeddings to each row (axis = 1)
sentiment_analysis_df["embeddings"] = sentiment_analysis_df.apply(lambda row: ge
    "input_ids": row["input_ids"],
    "attention_mask": row["attention_mask"],
    "token_type_ids": row["token_type_ids"]
}), axis=1)
```

```python
sentiment_analysis_2_df["embeddings"] = sentiment_analysis_2_df.apply(lambda row
    "input_ids": row["input_ids"],
    "attention_mask": row["attention_mask"],
    "token_type_ids": row["token_type_ids"]
}), axis=1)
```

```python
print(sentiment_analysis_df[["text", "embeddings"]])
```

```
                                                 text  \
0                                                 Yes
1    RT @Starlink: Starlink Mini enables high-speed...
3    RT @teslaownersSV: SpaceX is making fully rapi...
4    RT @iam_smx: Elon Musk and his, Son Lil X are ...
7        Actual public support for @DOGE is super high!
..                                                 ...
14   Much appreciated @SeanHannity!\n https://t.co/...
15   RT @MarioNawfal: 🚨 us CNN ANCHOR LEFT SPEECHLE...
17   RT @RapidResponse47: .@VP: The U.S. unfortunat...
18   RT @GigaBasedDad: Are you paying attention yet...
19   RT @WallStreetApes: Elon Musk explains the NGO...

                                           embeddings
0    [-0.30237678, 0.2931397, -0.055863995, -0.0921...
1    [-0.3588954, -0.23392645, 0.056638043, 0.07893...
3    [-0.5385479, -0.03152224, 0.13896738, -0.01198...
4    [-0.41037434, 0.12710425, -0.12426515, 0.32823...
7    [-0.13843504, 0.022904225, 0.020527555, 0.3367...
..                                                 ...
14   [-0.1239125, 0.17156506, -0.035864715, -0.0447...
15   [0.0036445698, -0.041512147, 0.08062579, 0.000...
17   [-0.5744013, -0.15945292, 0.10397415, 0.109556...
18   [-0.067059286, 0.4439409, -0.12397678, 0.09961...
19   [0.13153559, 0.081997186, 0.005705986, 0.03012...

[721 rows x 2 columns]
```

Now the K mean clustering method will be used to cluster similiar tweets under one categeory based on how close they are together in space. Base on number of

k(centroids) will it calculate to which cluster it belongs.

In [380...
```python
#Clusterins with K-Means
embeddings_1 = np.array(sentiment_analysis_df["embeddings"].tolist())
embeddings_2 = np.array(sentiment_analysis_2_df["embeddings"].tolist())

number_of_clusters = 3
K_means = KMeans(n_clusters=number_of_clusters, random_state=25)

K_means.fit(embeddings_1)
```

```
c:\Users\tomas\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:1429: UserW
arning: KMeans is known to have a memory leak on Windows with MKL, when there are
less chunks than available threads. You can avoid it by setting the environment v
ariable OMP_NUM_THREADS=3.
  warnings.warn(
```

Out[380...
```
▼                    KMeans                    ⓘ ?

KMeans(n_clusters=3, random_state=25)
```

In [381...
```python
sentiment_analysis_df["cluster"] = K_means.labels_
```

In [382...
```python
K_means.fit(embeddings_2)
```

```
c:\Users\tomas\anaconda3\Lib\site-packages\sklearn\cluster\_kmeans.py:1429: UserW
arning: KMeans is known to have a memory leak on Windows with MKL, when there are
less chunks than available threads. You can avoid it by setting the environment v
ariable OMP_NUM_THREADS=3.
  warnings.warn(
```

Out[382...
```
▼                    KMeans                    ⓘ ?

KMeans(n_clusters=3, random_state=25)
```

In [383...
```python
sentiment_analysis_2_df["cluster"] = K_means.labels_
```

In [384...
```python
print(sentiment_analysis_df[["text_cleaned", "cluster"]].head())
```

```
                                        text_cleaned  cluster
0                                                yes        1
1          starlink mini enables high speed internet go        0
3   spacex making fully rapidly reusable rocket ho...        0
4                 elon musk his son lil x inseparable hi        0
7                      actual public support super high        0
```

Now that we got embeddings calculated from input_ids, attention_mask, token_type_ids and have done clustering using K means we can visualize the results with 3 cluster which coudl be postive, negative and neutral. But first thing first is that the reduction of dimensions is needed because "bert-base-uncased" uses default size vector of 768 dimensionand we cannot visualize that. Therefore the PCA (Principal Component Analysis) is used because it reduces dimensionality while leaving as much information as possible.

In [385...
```python
#Use PCA to reduce the embeddings to 2D for visualization
pca = PCA(n_components=2)
```
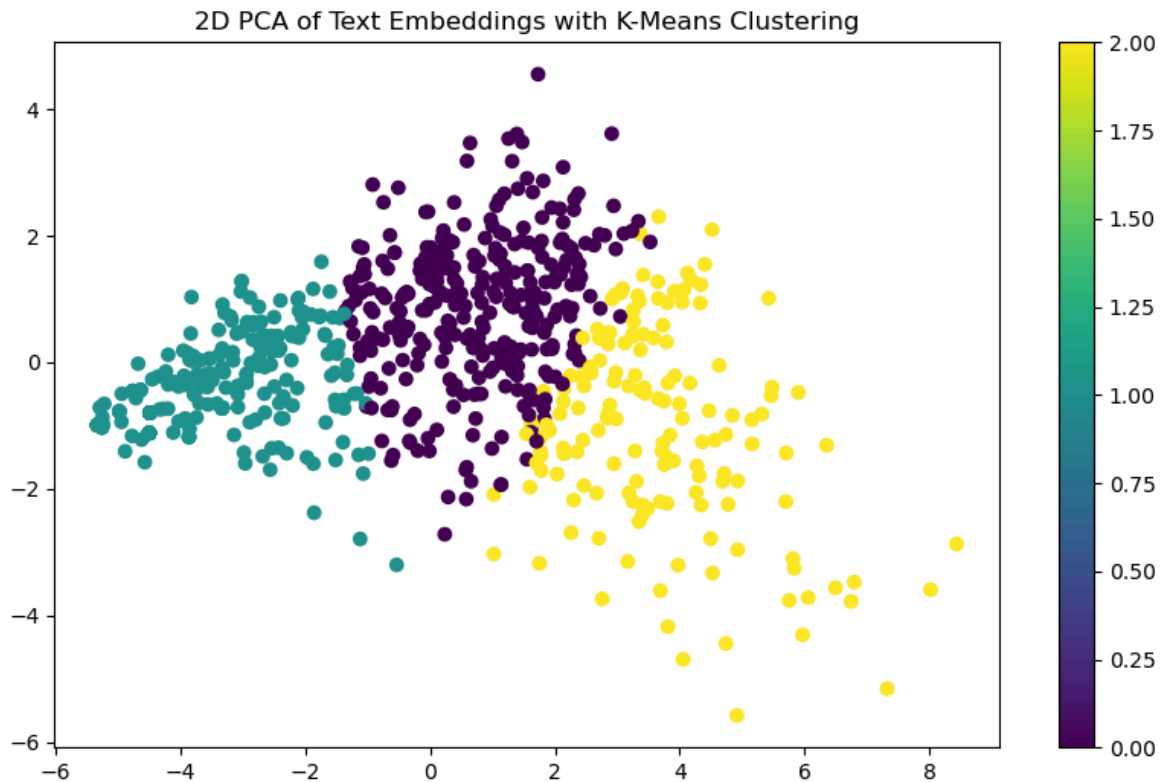
```python
reduced_embeddings = pca.fit_transform(embeddings_1)

sentiment_analysis_df["pca_1"] = reduced_embeddings[:, 0]
sentiment_analysis_df["pca_2"] = reduced_embeddings[:, 1]

#USing scatter plot
plt.figure(figsize=(10, 6))
plt.scatter(x = sentiment_analysis_df["pca_1"], y = sentiment_analysis_df["pca_2
plt.colorbar()
plt.title("2D PCA of Text Embeddings with K-Means Clustering")
plt.show()
```
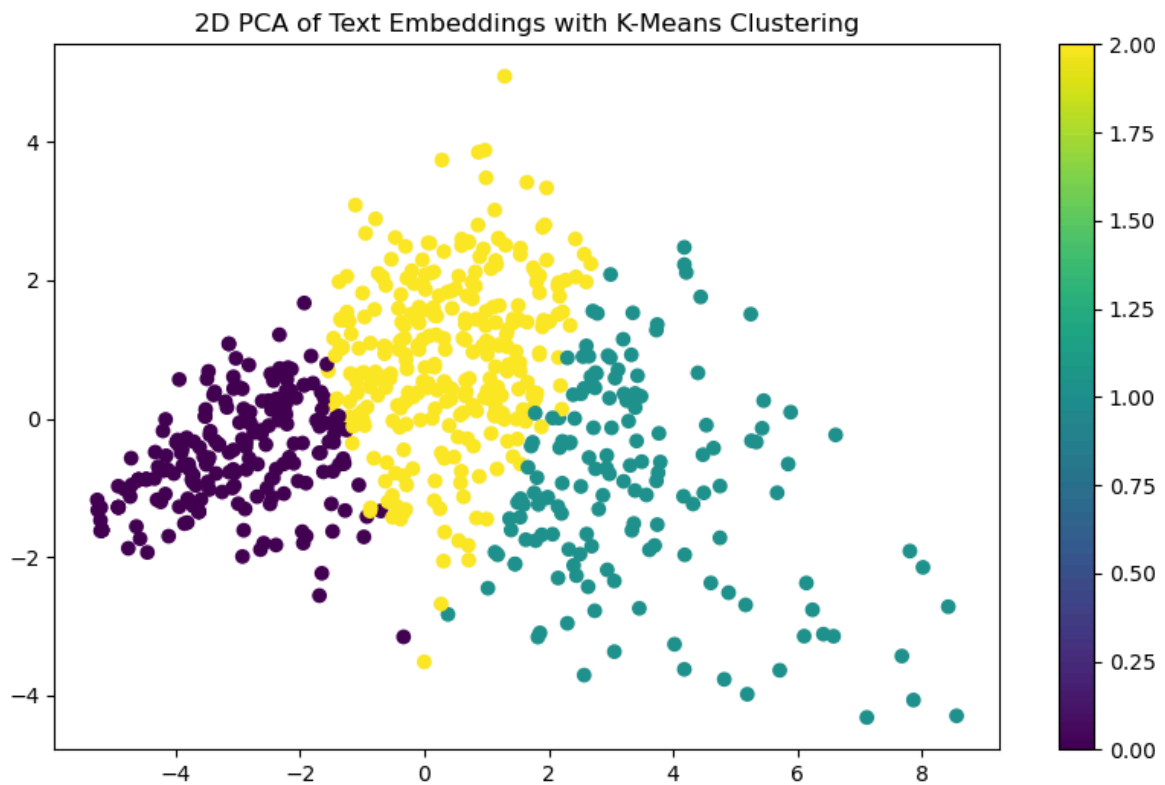

2D PCA of Text Embeddings with K-Means Clustering

```python
#Use PCA to reduce the embeddings to 2D for visualization
pca = PCA(n_components=2)
reduced_embeddings = pca.fit_transform(embeddings_2)

sentiment_analysis_2_df["pca_1"] = reduced_embeddings[:, 0]
sentiment_analysis_2_df["pca_2"] = reduced_embeddings[:, 1]

#USing scatter plot
plt.figure(figsize=(10, 6))
plt.scatter(x = sentiment_analysis_2_df["pca_1"], y = sentiment_analysis_2_df["p
plt.colorbar()
plt.title("2D PCA of Text Embeddings with K-Means Clustering")
plt.show()
```

2D PCA of Text Embeddings with K-Means Clustering


```
print(tokenized_sentiment_analysis[["cluster", "embeddings"]].head())
print(tokenized_sentiment_analysis_2[["cluster", "embeddings"]].head())
```

```
   cluster                                      embeddings
0        1  [-0.30237678, 0.2931397, -0.055863995, -0.0921...
1        0  [-0.3588954, -0.23392645, 0.056638043, 0.07893...
3        0  [-0.5385479, -0.03152224, 0.13896738, -0.01198...
4        0  [-0.41037434, 0.12710425, -0.12426515, 0.32823...
7        0  [-0.13843504, 0.022904225, 0.020527555, 0.3367...
   cluster                                      embeddings
1        2  [-0.3588954, -0.23392645, 0.056638043, 0.07893...
3        2  [-0.5385479, -0.03152224, 0.13896738, -0.01198...
4        2  [-0.5525136, 0.058236405, -0.025181722, 0.1508...
7        2  [-0.13843504, 0.022904225, 0.020527555, 0.3367...
8        0  [0.10943077, 0.13378796, 0.16734082, -0.145439...
```

Using the scatterplot and head() function we can see that there has been a difference in clustering. The only difference between these two models is the usage of stop words basic and custom set. Based on article Moradi et. al.(2021) "The evaluations on various NLP tasks imply that these models are sensitive to different character-level and word-level perturbations to the input, and the models' performance can decrease when the input contains slight noise." Which show that even on large scale or big data the BERT model is not very robust and can be affected with minor changes to the text. Which would explain the different results with basic and custom stop words sets. This could possibly be aliviated with pre-training the model on the data which we are going to be testing it on instead usin pre-trained model. Also with larger dataset.

So to summarize the results for rule based model VADER we got similiar results. The difference in sets for stop words did not affect it as much as BERT but we still could find that those two datasets were statistically different. This difference only rose in power when used with BERT a deep learning model. Where the changes in preprocessing

produced completely different results and even different classification according to K-Means. Further fine-tuning and larger dataset could offset this problem. Also with using specific set for stop words removal for socail media could aid in getting robust results.

In [394...
```python
#Saving the results to a JSON file
sentiment_analysis_df.to_json('sentiment_analysis_df.json', orient='records', li
sentiment_analysis_2_df.to_json('sentiment_analysis_2_df.json', orient='records'
```