KANYE WEST TWEETS

Analyzation of kanye west tweets. Example of text mining. Used technics are: tokenization, stopwords and lemmatization.

In [ ]:

```
import nltk
import pandas as pd
from nltk import tokenize
from nltk.tokenize import RegexpTokenizer
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
from nltk.sentiment import SentimentIntensityAnalyzer
from nltk.probability import FreqDist
import seaborn as sns
import matplotlib.pyplot as plt
import numpy as np
import text2emotion as te

nltk.download("stopwords")
nltk.download("wordnet")
nltk.download("omw-1.4")
nltk.download('vader_lexicon')
nltk.download("punkt")
```

```
[nltk_data] Downloading package stopwords to
[nltk_data]     C:\Users\olewn\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
[nltk_data] Downloading package wordnet to
[nltk_data]     C:\Users\olewn\AppData\Roaming\nltk_data...
[nltk_data]   Package wordnet is already up-to-date!
[nltk_data] Downloading package omw-1.4 to
[nltk_data]     C:\Users\olewn\AppData\Roaming\nltk_data...
[nltk_data]   Package omw-1.4 is already up-to-date!
[nltk_data] Downloading package vader_lexicon to
[nltk_data]     C:\Users\olewn\AppData\Roaming\nltk_data...
[nltk_data]   Package vader_lexicon is already up-to-date!
[nltk_data] Downloading package punkt to
[nltk_data]     C:\Users\olewn\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
```

```
Out[ ]: True
```

Firstly, we will preprocess data. Delete spam, duplicates and posts from other social media than Twitter. Then we change our data to only contain date in YYYY:MM:DD format.

In [ ]:

```
df = pd.read_csv('tweets.csv')
df["text"] = df["text"].astype(str).str.lower()
df = df.drop_duplicates(subset=['text'])
df = df[~df['text'].str.contains('@@@@@@@@')]
df = df[~df['text'].str.contains('http://')]
df = df[~df['text'].str.contains('https://')]
filter = df['source'].str.contains("Twitter.*")
df = df[filter]
print(df.shape)

df["date"] = df["date"].apply(lambda x: x[:10])
print(df["date"].head(1))
print(df["text"].head(5))
```

```
(9600, 12)
1    2022-12-19
Name: date, dtype: object
1    can we all agree that ye has a point\n\n#kanye...
3                           #kanyewest  suck my dick
5    ye is the most recognised and original jew, th...
6       kanye did nothing wrong #hitler #ye #kanyewest
9    #kanyewest is one of top 3 favorite rappers ju...
Name: text, dtype: object
```

Now we will preprocess the text. First part is tokenization. We will split the text into words. If this text was build of 'normal' sentences we also would need to split text into sentences, and then into words.

In [ ]:

```
regexp = RegexpTokenizer("\w+")
df["text_token"] = df["text"].apply(regexp.tokenize)
print(df["text_token"].head(5))
```

```
1    [can, we, all, agree, that, ye, has, a, point,...
3                          [kanyewest, suck, my, di, ck]
5    [ye, is, the, most, recognised, and, original,...
6    [kanye, did, nothing, wrong, hitler, ye, kanye...
9    [kanyewest, is, one, of, top, 3, favorite, rap...
Name: text_token, dtype: object
```

Now we download stopwords - the words which basically are not so important in sentences. Also we add some special stopwords for this exercise - the nickname of Kanye West. Then we delete them from our tweets. Second thing what we delete are words that are no longer than 2 letters.

In [ ]:

```
stopwords = nltk.corpus.stopwords.words("english")
my_stopwords = ["kanyewest"]
stopwords.extend(my_stopwords)
print(df["text_token"].head(5))

df["text_token"] = df["text_token"].apply(lambda x: [item for item in x if item not in stopwords])
df["text_string"] = df["text_token"].apply(lambda x: " ".join([item for item in x if len(item)>2]))
print(df[['text', 'text_token', 'text_string']].head(5))
```

```
1    [can, we, all, agree, that, ye, has, a, point,...
3                          [kanyewest, suck, my, di, ck]
5    [ye, is, the, most, recognised, and, original,...
6    [kanye, did, nothing, wrong, hitler, ye, kanye...
9    [kanyewest, is, one, of, top, 3, favorite, rap...
Name: text_token, dtype: object
                                                text  \
1  can we all agree that ye has a point\n\n#kanye...
3                           #kanyewest  suck my dick
5  ye is the most recognised and original jew, th...
6     kanye did nothing wrong #hitler #ye #kanyewest
9  #kanyewest is one of top 3 favorite rappers ju...

                                          text_token  \
1                [agree, ye, point, ye2024, joebiden]
3                                      [suck, di, ck]
5  [ye, recognised, original, jew, hate, self, el...
6                 [kanye, nothing, wrong, hitler, ye]
9  [one, top, 3, favorite, rappers, listen, verse...

                                         text_string
1                         agree point ye2024 joebiden
3                                                suck
5  recognised original jew hate self elected made...
6                           kanye nothing wrong hitler
9  one top favorite rappers listen verse runthistown
```

Here we can see the frequency of words used in all of tweets.

In [ ]:

```
all_words = ' '.join([word for word in df['text_string']])
tokenized_words = tokenize.word_tokenize(all_words, language="english")
fdist = FreqDist(tokenized_words)
fdist
```

```
Out[ ]: FreqDist({'kanye': 4626, 'adidas': 1658, 'people': 1444, 'like': 943, 'black': 817, 'amp': 767, 'west': 646, 'get': 611, 'said': 609, 'hitler': 577, ...})
```

There we will delete word which are infrequent.

In [ ]:

```
df["text_string_fdist"] = df["text_token"].apply(lambda x: " ".join([item for item in x if fdist[item] >= 4]))
print(df[['text', 'text_token', 'text_string']].head(5))
```

```
                                                text  \
1  can we all agree that ye has a point\n\n#kanye...
3                           #kanyewest  suck my dick
5  ye is the most recognised and original jew, th...
6     kanye did nothing wrong #hitler #ye #kanyewest
9  #kanyewest is one of top 3 favorite rappers ju...

                                          text_token  \
1                [agree, ye, point, ye2024, joebiden]
3                                      [suck, di, ck]
5  [ye, recognised, original, jew, hate, self, el...
6                 [kanye, nothing, wrong, hitler, ye]
9  [one, top, 3, favorite, rappers, listen, verse...

                                         text_string
1                         agree point ye2024 joebiden
3                                                suck
5  recognised original jew hate self elected made...
6                           kanye nothing wrong hitler
9  one top favorite rappers listen verse runthistown
```

Lemmatization. It is a process in which we delete different forms of one word and leave the "basic" word. It will help our algorithm.

In [ ]:

```
wordnet_lem = WordNetLemmatizer()
df["text_string_lem"] = df["text_string_fdist"].apply(wordnet_lem.lemmatize)

df['is_equal']= (df['text_string_fdist']==df['text_string_lem'])
df.is_equal.value_counts()
```

```
Out[ ]: True     9594
        False       6
        Name: is_equal, dtype: int64
```

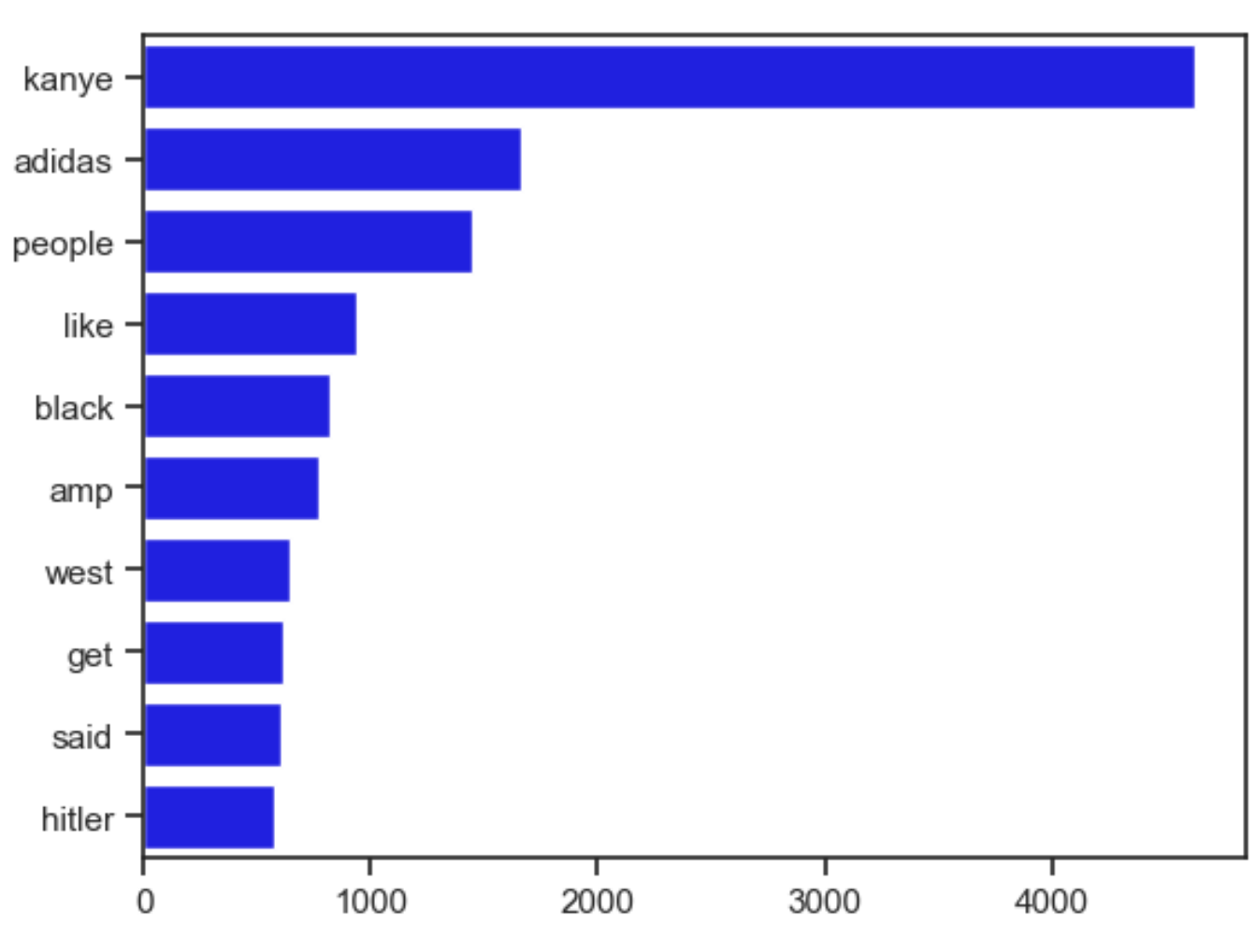
How many of the 10 most frequent words after lemmatization were used in all tweets.

In [ ]:

```
all_words_lem = ' '.join([word for word in df['text_string_lem']])
words = tokenize.word_tokenize(all_words_lem)
fd = FreqDist(words)
print(fd.tabulate(10))

top_10 = fd.most_common(10)
fdist = pd.Series(dict(top_10))
sns.set_theme(style="ticks")
sns.barplot(y=fdist.index, x=fdist.values, color='blue')
```

```
 kanye adidas people   like  black    amp   west    get   said hitler
  4626   1658   1444    943    817    767    646    611    609    577
None
```

```
Out[ ]: <AxesSubplot:>
```



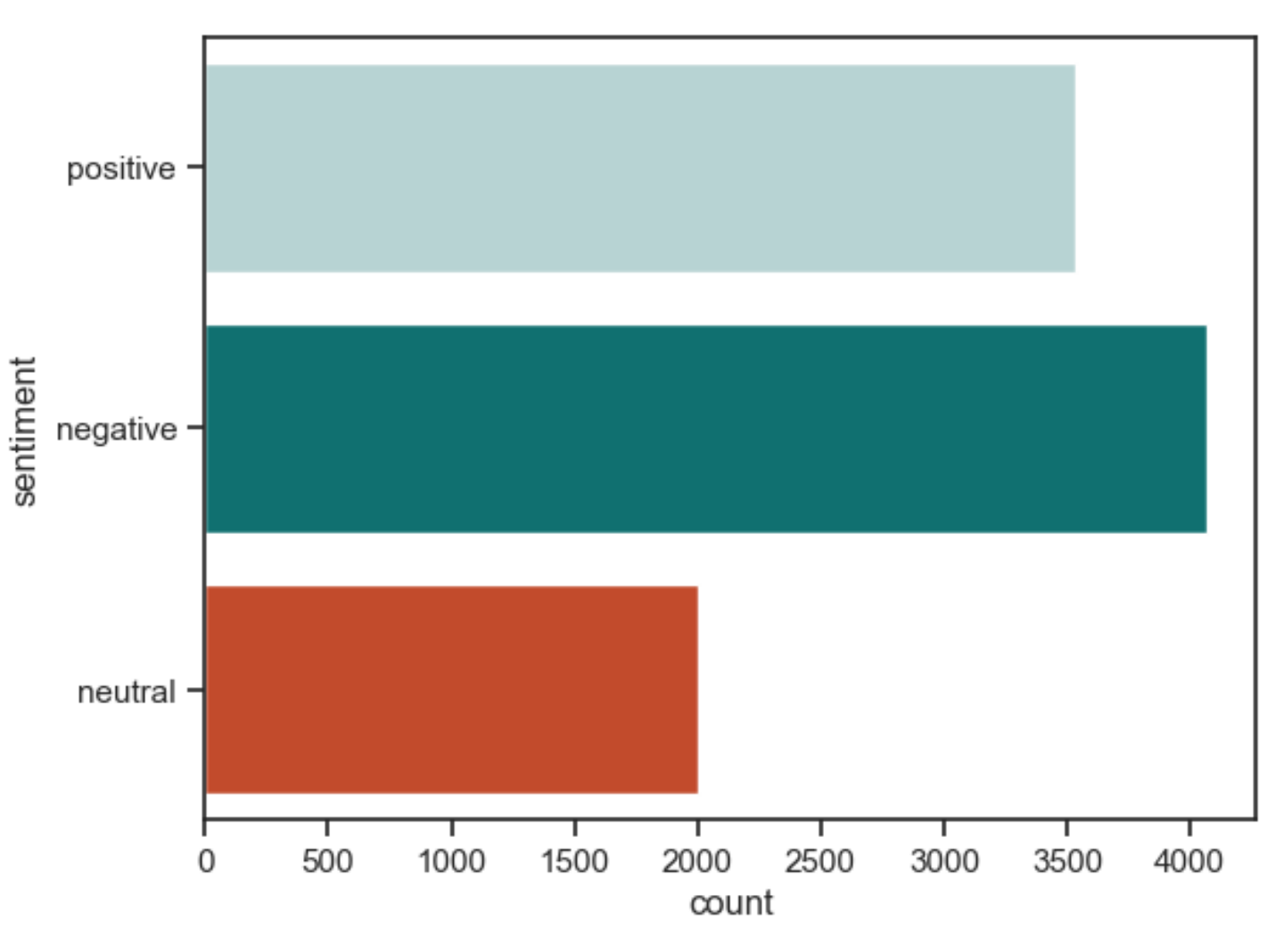
Now, with the library "vader" we analyze the polarity of tweets. We also delete unnecessary columns and leave only those which are important. As shown below we have negative, neutral and positive tweets.

In [ ]:

```
analyzer = SentimentIntensityAnalyzer()
df["polarity"] = df["text_string_lem"].apply(lambda x: analyzer.polarity_scores(x))

df = pd.concat(
    [df.drop(['user_description', 'user_created', 'user_followers','user_friends', 'user_favourites', 'user_verified', 'polarity'], axis=1),
     df['polarity'].apply(pd.Series)], axis=1)

df['sentiment'] = df['compound'].apply(lambda x: 'positive' if x >0 else 'neutral' if x==0 else 'negative')

sns.countplot(y='sentiment',
             data=df,
             palette=['#b2d8d8',"#008080", '#db3d13']
             )
```

```
            user_name         user_location        date  \
1         Jon carrick                   NaN  2022-12-19
3          god dammit                   NaN  2022-12-19
5     Oliver Brittain  Northampton, England  2022-12-19
6  Man with white van                   NaN  2022-12-19
9            jonathan         Charlotte, NC  2022-12-19

                                                text  \
1  can we all agree that ye has a point\n\n#kanye...
3                           #kanyewest  suck my dick
5  ye is the most recognised and original jew, th...
6     kanye did nothing wrong #hitler #ye #kanyewest
9  #kanyewest is one of top 3 favorite rappers ju...

                              hashtags               source  \
1  ['KanyeWest', 'ye2024', 'JoeBiden']      Twitter Web App
3                        ['KanyeWest']   Twitter for iPhone
5                                  NaN  Twitter for Android
6       ['hitler', 'ye', 'KanyeWest']   Twitter for iPhone
9        ['KanyeWest', 'RunThisTown']   Twitter for iPhone

                                          text_token  \
1                [agree, ye, point, ye2024, joebiden]
3                                      [suck, di, ck]
5  [ye, recognised, original, jew, hate, self, el...
6                 [kanye, nothing, wrong, hitler, ye]
9  [one, top, 3, favorite, rappers, listen, verse...

                                         text_string  \
1                         agree point ye2024 joebiden
3                                                suck
5  recognised original jew hate self elected made...
6                           kanye nothing wrong hitler
9  one top favorite rappers listen verse runthistown

                                   text_string_fdist  \
1                         agree point ye2024 joebiden
3                                                suck
5  original jew hate self elected made jews chose...
6                           kanye nothing wrong hitler
9                  one top favorite rappers listen verse

                                     text_string_lem  is_equal    neg    neu  \
1                         agree point ye2024 joebiden      True  0.000  0.545
3                                                suck      True  1.000  0.000
5  original jew hate self elected made jews chose...      True  0.264  0.571
6                           kanye nothing wrong hitler      True  0.000  0.540
9                  one top favorite rappers listen verse      True  0.000  0.455

     pos  compound sentiment
1  0.455    0.3612  positive
3  0.000   -0.4404  negative
5  0.164   -0.3400  negative
6  0.460    0.3724  positive
9  0.545    0.5859  positive
```

```
Out[ ]: <AxesSubplot:xlabel='count', ylabel='sentiment'>
```



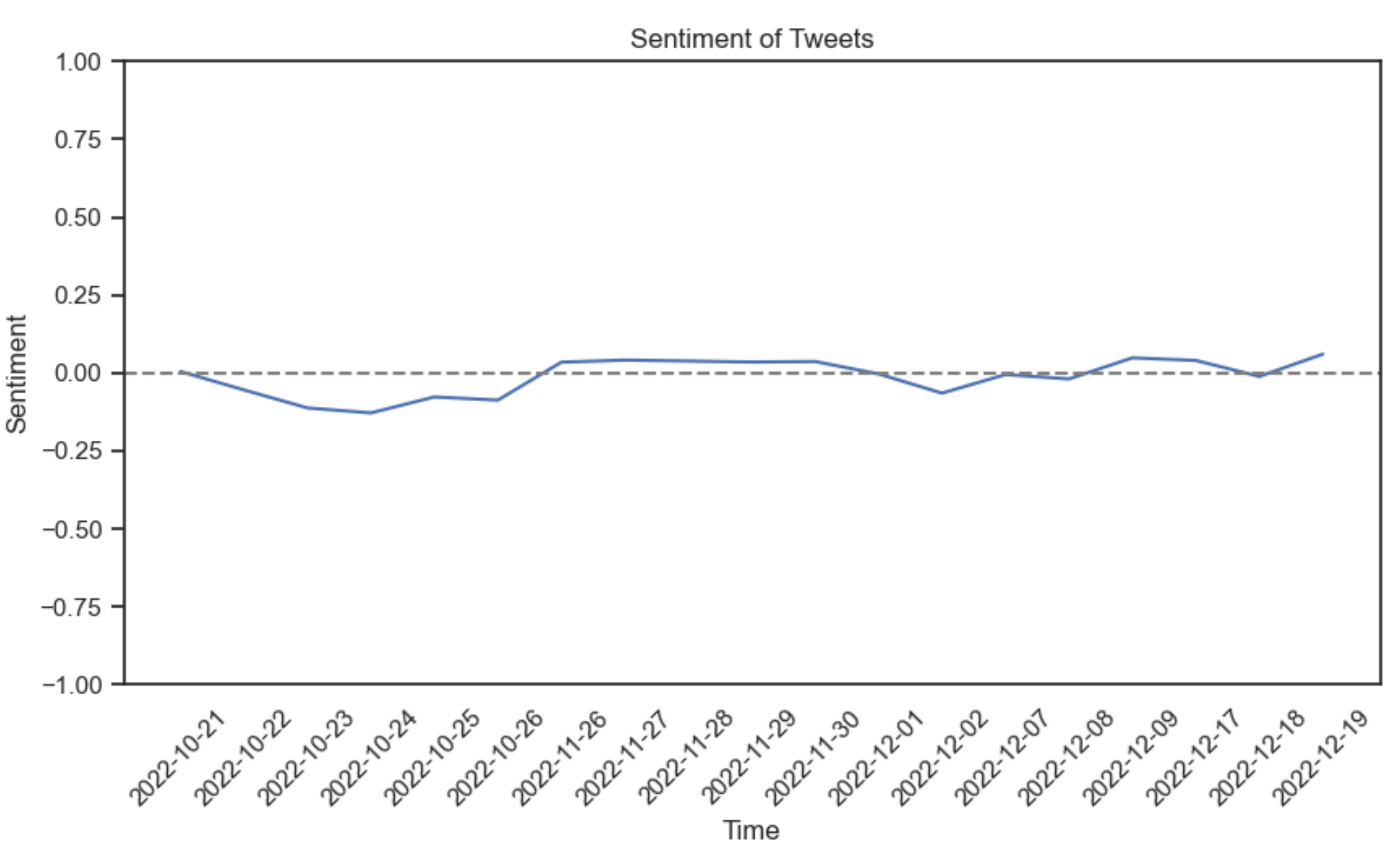
Here we group our tweets by date and take the average polarity. After sorting we display the result.

In [ ]:

```
daily_sentiment_df = df.groupby('date').mean()
daily_sentiment_df = daily_sentiment_df.sort_values(by=['date'])
# print(daily_sentiment_df)
# print(daily_sentiment_df.shape)

plt.figure(figsize=(10,5))
g = sns.lineplot(x='date', y='compound', data=daily_sentiment_df)

plt.xticks(rotation=45)
g.set(ylim=(-1, 1))
g.set(title='Sentiment of Tweets')
g.set(xlabel="Time")
g.set(ylabel="Sentiment")
g.tick_params(bottom=False)

g.axhline(0, ls='--', c = 'grey')
```

```
C:\Users\olewn\AppData\Local\Temp\ipykernel_860\1530840048.py:1: FutureWarning: The default value of numeric_only in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. E
ither specify numeric_only or select only columns which should be valid for the function.
  daily_sentiment_df = df.groupby('date').mean()
```

```
Out[ ]: <matplotlib.lines.Line2D at 0x24a97952740>
```



With the library "text2emotions" we can specify if tweets are happy, angry, surprise, sad or fear. We make the copy of DataFrame and use the library

In [ ]:

```
df_emotion = df.copy()
df_emotion['emotion'] = df_emotion["text_token"].apply(lambda x: te.get_emotion(' '.join(x)))
```

Then we split the "emotion" column into 5 separate columns.

In [ ]:

```
df_emotion['happy'] = df_emotion['emotion'].apply(lambda x: x['Happy'])
df_emotion['angry'] = df_emotion['emotion'].apply(lambda x: x['Angry'])
df_emotion['surprise'] = df_emotion['emotion'].apply(lambda x: x['Surprise'])
df_emotion['sad'] = df_emotion['emotion'].apply(lambda x: x['Sad'])
df_emotion['fear'] = df_emotion['emotion'].apply(lambda x: x['Fear'])
```

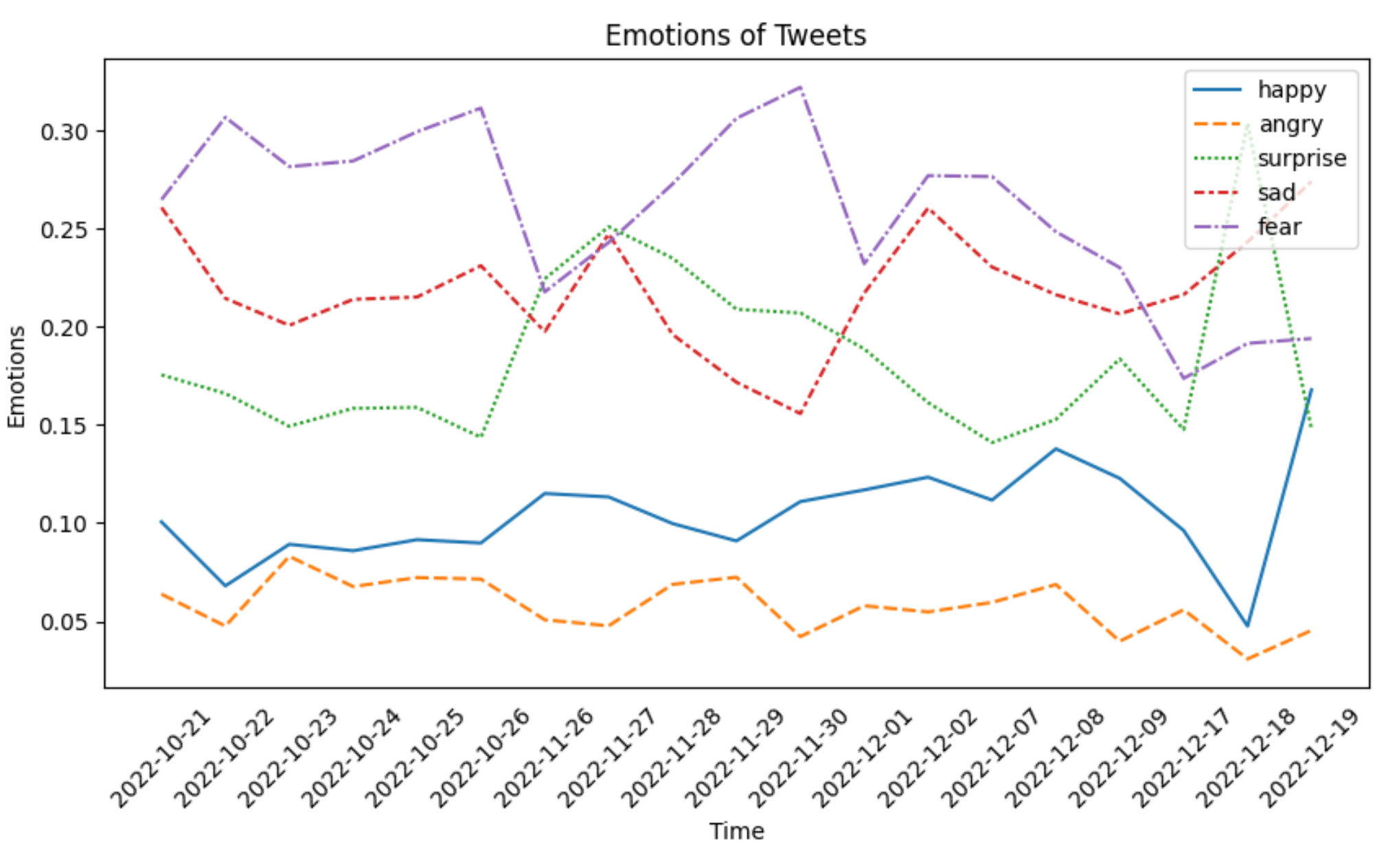
Once again we group this data by date and take average emotions. Then we sort and display it below.

In [ ]:

```
gruped_emotion_df = df_emotion.groupby('date').mean()
gruped_emotion_df = gruped_emotion_df.sort_values(by=['date'])
# print(gruped_emotion_df)

plt.figure(figsize=(10,5))
g = sns.lineplot(data=gruped_emotion_df[["happy","angry","surprise","sad","fear"]])

plt.xticks(rotation=45)
g.set(title='Emotions of Tweets')
g.set(xlabel="Time")
g.set(ylabel="Emotions")
g.tick_params(bottom=False)
```

```
C:\Users\olewn\AppData\Local\Temp\ipykernel_860\4005390345.py:2: FutureWarning: The default value of numeric_only in DataFrameGroupBy.mean is deprecated. In a future version, numeric_only will default to False. E
ither specify numeric_only or select only columns which should be valid for the function.
  gruped_emotion_df = df_emotion.groupby('date').mean()
```

```
                 neg       neu       pos  compound     happy     angry  \
date
2022-10-21  0.191919  0.637366  0.170683 -0.015248  0.100591  0.063817
2022-10-22  0.180990  0.655131  0.158788 -0.056718  0.068030  0.047576
2022-10-23  0.197686  0.670343  0.131971 -0.141484  0.089183  0.083039
2022-10-24  0.210913  0.638408  0.150678 -0.135624  0.085893  0.067664
2022-10-25  0.187048  0.660743  0.150698 -0.083580  0.091545  0.072249
2022-10-26  0.201693  0.643156  0.155162 -0.094831  0.089839  0.071473
2022-11-26  0.133624  0.694258  0.172043  0.035787  0.115054  0.050753
2022-11-27  0.150504  0.653920  0.186726  0.044466  0.113274  0.047699
2022-11-28  0.162177  0.654872  0.182965  0.035970  0.099716  0.068794
2022-11-29  0.137907  0.698814  0.163260  0.030068  0.090898  0.072425
2022-11-30  0.146325  0.679045  0.174649  0.035918  0.110909  0.042208
2022-12-01  0.177329  0.642579  0.179254 -0.012997  0.116861  0.057899
2022-12-02  0.180837  0.669774  0.149399 -0.073778  0.123355  0.054784
2022-12-07  0.160379  0.670994  0.163006 -0.018976  0.111695  0.059605
2022-12-08  0.169297  0.652142  0.178615 -0.021520  0.137770  0.068716
2022-12-09  0.132930  0.671433  0.189287  0.040592  0.122739  0.039873
2022-12-17  0.115690  0.708724  0.175586  0.027069  0.096207  0.055862
2022-12-18  0.157265  0.693735  0.128571 -0.047722  0.047551  0.030816
2022-12-19  0.146195  0.615854  0.213512  0.069454  0.167805  0.045366

            surprise       sad      fear
date
2022-10-21  0.175430  0.260591  0.264570
2022-10-22  0.165960  0.214343  0.306465
2022-10-23  0.149216  0.200621  0.281373
2022-10-24  0.158366  0.213832  0.284275
2022-10-25  0.158891  0.215000  0.299126
2022-10-26  0.143639  0.230965  0.311163
2022-11-26  0.224301  0.197419  0.217634
2022-11-27  0.250796  0.247168  0.242832
2022-11-28  0.234823  0.195957  0.272553
2022-11-29  0.208802  0.171647  0.305958
2022-11-30  0.206883  0.155714  0.321753
2022-12-01  0.188629  0.217007  0.231934
2022-12-02  0.161262  0.260299  0.276811
2022-12-07  0.140960  0.230282  0.276328
2022-12-08  0.152770  0.216216  0.248243
2022-12-09  0.183503  0.206497  0.230000
2022-12-17  0.147586  0.216207  0.173621
2022-12-18  0.303265  0.243061  0.191429
2022-12-19  0.148049  0.273902  0.193902
```



Suprisingly, in this dataset, tweets are mostly frightening. From polarity analyze we got that the average emotion is neutral. But it rather has high negative tweets.

Bibliography

Kanye West tweets dataset - https://www.kaggle.com/datasets/konradb/kanye-west-tweets

Pandas documentation - https://pandas.pydata.org/docs/reference/frame.html

NLTK documentation - https://www.nltk.org

Text mining - https://www.kirenz.com/post/2021-12-11-text-mining-and-sentiment-analysis-with-nltk-and-pandas-in-python/text-mining-and-sentiment-analysis-with-nltk-and-pandas-in-python/