

India has made it People's G20 Summit: PM Modi



Sentiment Analysis is the process of ‘computationally’ determining whether a piece of writing is positive, negative or neutral. It’s also known as opinion mining, deriving the opinion or attitude of a speaker.

Importing Libraries

```
In [1]: import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')

import plotly.express as px
import plotly.graph_objects as go

import re
import nltk

from nltk.corpus import stopwords
from nltk.tokenize import sent_tokenize, word_tokenize
from nltk.stem import WordNetLemmatizer
```

```
In [2]: !pip install vaderSentiment
```

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: vaderSentiment in c:\users\shubham\appdata\roami
ng\python\python39\site-packages (3.3.2)
Requirement already satisfied: requests in c:\programdata\anaconda3\lib\site-pa
ckages (from vaderSentiment) (2.28.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\programdata\anaconda
3\lib\site-packages (from requests->vaderSentiment) (1.26.11)
Requirement already satisfied: charset-normalizer<3,>=2 in c:\programdata\anaco
nda3\lib\site-packages (from requests->vaderSentiment) (2.0.4)
Requirement already satisfied: certifi>=2017.4.17 in c:\programdata\anaconda3\l
ib\site-packages (from requests->vaderSentiment) (2022.9.14)
Requirement already satisfied: idna<4,>=2.5 in c:\programdata\anaconda3\lib\sit
e-packages (from requests->vaderSentiment) (3.3)
```

```
In [4]: file_path="G20 Speech.txt"
with open(file_path,"r",encoding="utf-8") as file:
    G20_speech=file.read()
```

In [5]: G20_speech

```
Out[5]: '"" Leaders of the world\'s 20 big economies ended a summit in the Indian capital on \nSunday overcoming deep divisions over the war in Ukraine to produce a consensus document \nand move forward on issues such overhauling institutions like the World Bank.\n\nThey also formally admitted the African Union to the bloc to make the grouping more \nrepresentative.\n\nSOFTER LANGUAGE ON UKRAINE WAR\n\nG20 nations agreed that states cannot grab territory by force and highlighted the \nsuffering of the people of Ukraine, but avoided direct criticism of Russia for the war. \nThe declaration was seen as an apparent softening from the position that the G20 took \nlast year when it condemned Russia for the war and demanded that it withdraw from Ukraine. \n\nDiplomats said Russia would never have accepted an outright condemnation and that it was \nstill a successful outcome because everyone including Russia committed themselves to not \nseizing territory by force.\n\nHost India along with Brazil, Indonesia and South Africa, played a key role in avoiding a \nfracturing of the G20 over the Ukraine conflict, officials said, reflecting the growing \npower of the Global South developing nations in the group.\n\nAFRICAN UNION INSIDE THE CLUB\n\nThe 55-member African Union was formally made permanent member of the G20, \non par with the European Union, in order to make the grouping more representative.\nUntil now only South Africa was a member of the G20. The entry of the AU would \nprovide greater voice to the Global South within the G20 where the G7 countries \nhave long played a dominant role.\n\nThe move also came after the BRICs, another group dominated by China and Russia, \nwas expanded to include Saudi Arabia and Iran among other nations which was seen as \nan attempt by Beijing to make it a possible alternative to the G20.\n\nU.S., SAUDI, INDIA JOIN HANDS FOR TRANSPORT CORRIDOR\n\nLeaders of the United States, India and Saudi Arabia among others announced plans to \nset up rail and ports links between the Middle East and South Asia and eventually to \nEurope which U.S. President Joe Biden said was a "real big deal." \n\nThe Biden administration is seeking to counter China\'s Belt and Road push on global \ninfrastructure by pitching Washington as an alternative partner and investor for \ndeveloping countries at the G20 grouping.\n\nBut there were no details about financing or a time frame for the project that \ninvolved laying down railway lines in the Middle East and then connecting them to India by port.\n\nINCREMENTAL PROGRESS ON CLIMATE CHANGE\n\nThe G20 leaders agreed to pursue tripling renewable energy capacity globally by 2030 \nand accepted the need to phase-down unabated coal power, but stopped short of setting \nmajor climate goals.\n\nThe group did not provide any plan to amend existing policies and targets in order to \nachieve the target of ramping up renewables. It also said $4 trillion a year would be \nneeded to pay for a green energy transition but did not lay out any pathway to it.\n\nThe deliberations of the G20 were being closely watched ahead of the COP28 U.N climate \nsummit in the United Arab Emirates later this year.\n\nMODI BOOSTS STANDING AS INDIA\'S BIG MOMENT ARRIVES\n\nFor Indian Prime Minister Narendra Modi, the leadership of the G20 has been a year-long \nopportunity to showcase India as an influential diplomatic and economic power, and drive \ninvestment and trade flows into the world\'s most populous country.\n\nIt has also provided him a platform to boost his standing at home as he seeks a third term \nin office in elections in the next several months. Modi\'s image has been on G20 billboards \nacross the capital and in the vast and swanky new conference venue. To his supporters the \nsuccessful outcome of the summit showed India\'s big moment had arrived.\n\n'''
```

Preprocessing on text

Removing the Punctuations

```
In [6]: G20_speech_cleaned=re.sub(r'^\w\s',' ',G20_speech)
```

converting the text in lower case

```
In [7]: G20_speech_cleaned=G20_speech_cleaned.lower()
```

removing stopwords

```
In [8]: words=word_tokenize(G20_speech_cleaned)
stop_words=set(stopwords.words("english"))
```

Tokanization

```
In [9]: speech_filtered=[word for word in words if word not in stop_words]
speech_filtered
```

```
Out[9]: ['leaders',
'world',
'20',
'big',
'economies',
'ended',
'summit',
'indian',
'capital',
'sunday',
'overcoming',
'deep',
'divisions',
'war',
'ukraine',
'produce',
'consensus',
'document',
'move',
'forward']
```

lemmatization

```
In [10]: lemmatizer=WordNetLemmatizer()
speech_lemmatized=[lemmatizer.lemmatize(word) for word in speech_filtered]
```

```
In [11]: speech_lemmatized
```

```
Out[11]: ['leader',
          'world',
          '20',
          'big',
          'economy',
          'ended',
          'summit',
          'indian',
          'capital',
          'sunday',
          'overcoming',
          'deep',
          'division',
          'war',
          'ukraine',
          'produce',
          'consensus',
          'document',
          'move',
          '...']
```

from vader library import the required funtion

```
In [12]: from nltk.sentiment.vader import SentimentIntensityAnalyzer
```

```
In [13]: senti=SentimentIntensityAnalyzer()
senti
```

```
Out[13]: <nltk.sentiment.vader.SentimentIntensityAnalyzer at 0x19e96168730>
```

calculating the degree of sentiment

```
In [14]: sentiment_scores=[senti.polarity_scores(word)["compound"]for word in speech_lemma
print(sentiment_scores)
```

```
[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, -0.5994, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.3612, 0.0, 0.0, 0.0, 0.0, 0.1027, 0.
0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, -0.5994, 0.0, 0.0, 0.2732, 0.0, 0.0,
0.0, 0.0, 0.0, -0.4767, 0.0, 0.0, -0.34, 0.0, -0.4404, 0.0, -0.5994, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, -0.4404, 0.0, -0.5994, -0.2263, 0.0, 0.0, 0.
0, 0.0, 0.0, 0.0, 0.0, 0.2732, 0.0, -0.5859, 0.0, 0.5859, 0.0, 0.0, 0.0, 0.0,
0.2732, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.34, 0.0, 0.0, -0.3
4, 0.0, 0.0, 0.0, 0.0, -0.3182, 0.0, 0.0, 0.0, 0.1779, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.3612, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.34, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.296, 0.4939, 0.0, 0.0, 0.0, 0.4215, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.4215, 0.0, 0.0, 0.0, 0.0, 0.2732, 0.
0, 0.0, 0.0, 0.2732, 0.0, 0.0, 0.0, 0.2732, 0.0, 0.0, 0.0, 0.0, 0.0, -0.2263,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, -0.1027, 0.0, 0.2732, 0.0, 0.0, 0.0, 0.
0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.4215, 0.0, 0.0, 0.0, 0.0, 0.
0, 0.4019, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.4215, 0.0, 0.0, 0.4404, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.4019, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.2732, 0.5859, 0.0, 0.0, 0.
0, 0.0, 0.0, 0.0, 0.0]
```

giving the bench mark for positive , negative ,neutral words bench mark value

```
In [15]: positive_words=[word for i,word in enumerate(speech_lemmatized) if sentiment_sco
negative_words=[word for i,word in enumerate(speech_lemmatized) if sentiment_scor
neutral_words=[word for i,word in enumerate(speech_lemmatized) if sentiment_score
sentiment_scores[i]<=0.1]
```

```
In [16]: print("positive words \n", positive_words)
print("negative words \n", negative_words)
print("neutral words \n", neutral_words)
```

positive words

```
['like', 'admitted', 'agreed', 'accepted', 'successful', 'committed', 'played', 'growing', 'greater', 'played', 'join', 'hand', 'united', 'progress', 'agreed', 'energy', 'accepted', 'energy', 'united', 'boost', 'opportunity', 'influential', 'boost', 'supporter', 'successful']
```

negative words

```
['war', 'war', 'suffering', 'avoided', 'criticism', 'war', 'condemned', 'war', 'demanded', 'condemnation', 'avoiding', 'conflict', 'stopped', 'pay']
```

neutral words

```
['leader', 'world', '20', 'big', 'economy', 'ended', 'summit', 'indian', 'capital', 'sunday', 'overcoming', 'deep', 'division', 'ukraine', 'produce', 'consensus', 'document', 'move', 'forward', 'issue', 'overhauling', 'institution', 'world', 'bank', 'also', 'formally', 'african', 'union', 'bloc', 'make', 'grouping', 'representative', 'softer', 'language', 'ukraine', 'g20', 'nation', 'state', 'grab', 'territory', 'force', 'highlighted', 'people', 'ukraine', 'direct', 'russia', 'declaration', 'seen', 'apparent', 'softening', 'position', 'g20', 'took', 'last', 'year', 'russia', 'withdraw', 'ukraine', 'diplomat', 'said', 'russia', 'would', 'never', 'outright', 'still', 'outcome', 'everyone', 'including', 'russia', 'seizing', 'territory', 'force', 'host', 'india', 'along', 'brazil', 'indonesia', 'south', 'africa', 'key', 'role', 'fracturing', 'g20', 'ukraine', 'official', 'said', 'reflecting', 'power', 'global', 'south', 'developing', 'nation', 'group', 'african', 'union', 'inside', 'club', '55', 'member', 'african', 'union', 'formally', 'made', 'permanent', 'member', 'g20', 'par', 'european', 'union', 'order', 'make', 'grouping', 'representative', 'south', 'africa', 'member', 'g20', 'entry', 'au', 'would', 'provide', 'voice', 'global', 'south', 'within', 'g20', 'g7', 'country', 'long', 'dominant', 'role', 'move', 'also', 'came', 'brics', 'another', 'group', 'dominated', 'china', 'russia', 'expanded', 'include', 'saudi', 'arabia', 'iran', 'among', 'nation', 'seen', 'attempt', 'beijing', 'make', 'possible', 'alternate', 'g20', 'u', 'saudi', 'india', 'transport', 'corridor', 'leader', 'state', 'india', 'saudi', 'arabia', 'among', 'others', 'announced', 'plan', 'set', 'rail', 'port', 'link', 'middle', 'east', 'south', 'asia', 'eventually', 'europe', 'u', 'president', 'joe', 'biden', 'said', 'real', 'big', 'deal', 'biden', 'administration', 'seeking', 'counter', 'china', 'belt', 'road', 'push', 'global', 'infrastructure', 'pitching', 'washington', 'alternative', 'partner', 'investor', 'developing', 'country', 'g20', 'grouping', 'detail', 'financing', 'time', 'frame', 'project', 'involved', 'laying', 'railway', 'line', 'middle', 'east', 'connecting', 'india', 'port', 'incremental', 'climate', 'change', 'g20', 'leader', 'pursue', 'tripling', 'renewable', 'capacity', 'globally', '2030', 'need', 'phase', 'unabated', 'coal', 'power', 'short', 'setting', 'major', 'climate', 'goal', 'group', 'provide', 'plan', 'amend', 'existing', 'policy', 'target', 'order', 'achieve', 'target', 'ramping', 'renewables', 'also', 'said', '4', 'trillion', 'year', 'would', 'needed', 'green', 'transition', 'lay', 'pathway', 'deliberation', 'g20', 'closely', 'watched', 'ahead', 'cop28', 'u', 'n', 'climate', 'summit', 'arab', 'emirate', 'later', 'year', 'modi', 'standing', 'india', 'big', 'moment', 'arrives', 'indian', 'prime', 'minister', 'narendra', 'modi', 'leadership', 'g20', 'year', 'long', 'showcase', 'india', 'diplomatic', 'economic', 'power', 'drive', 'investment', 'trade', 'flow', 'world', 'populous', 'country', 'also', 'provided', 'platform', 'standing', 'home', 'seek', 'third', 'term', 'office', 'election', 'next', 'several', 'month', 'modi', 'image', 'g20', 'billboard', 'across', 'capital', 'vast', 'swanky', 'new', 'conference', 'venue', 'outcome', 'summit', 'showed', 'india', 'big', 'moment', 'arrived']
```

```
In [17]: positive_word_freq=nlk.FreqDist(positive_words)
negative_word_freq=nlk.FreqDist(negative_words)
neutral_word_freq=nlk.FreqDist(neutral_words)
```

```
In [18]: print(positive_word_freq)
```

<FreqDist with 18 samples and 25 outcomes>

```
In [19]: print(negative_word_freq)
```

<FreqDist with 11 samples and 14 outcomes>

```
In [20]: print(neutral_word_freq)
```

<FreqDist with 230 samples and 335 outcomes>

```
In [ ]:
```

EDA on the different type of words

```
In [21]: df_positive=pd.DataFrame(positive_word_freq.most_common(25),columns=["Word","Frequency"])
df_negative=pd.DataFrame(negative_word_freq.most_common(25),columns=["Word","Frequency"])
df_neutral=pd.DataFrame(neutral_word_freq.most_common(25),columns=["Word","Frequency"])
```


In [22]: df_positive

Out[22]:

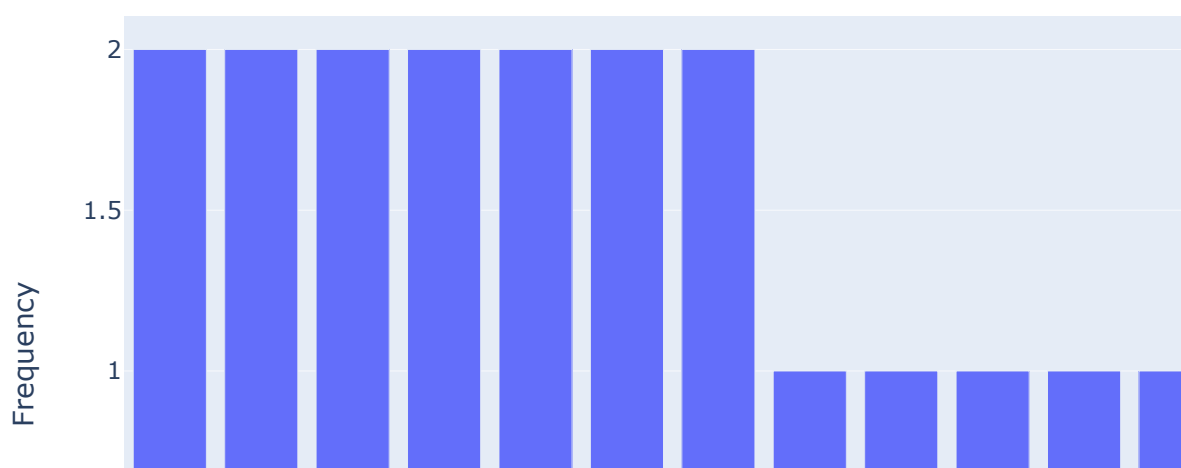
| | Word | Frequency |
|----|-------------|-----------|
| 0 | agreed | 2 |
| 1 | accepted | 2 |
| 2 | successful | 2 |
| 3 | played | 2 |
| 4 | united | 2 |
| 5 | energy | 2 |
| 6 | boost | 2 |
| 7 | like | 1 |
| 8 | admitted | 1 |
| 9 | committed | 1 |
| 10 | growing | 1 |
| 11 | greater | 1 |
| 12 | join | 1 |
| 13 | hand | 1 |
| 14 | progress | 1 |
| 15 | opportunity | 1 |
| 16 | influential | 1 |
| 17 | supporter | 1 |

plotting the graph

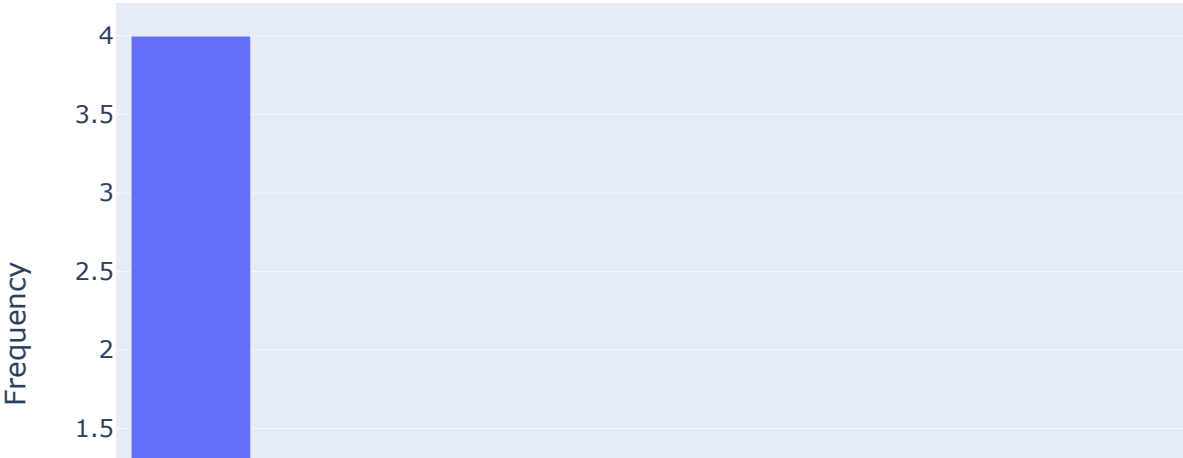
```
In [23]: positive_figure=px.bar(df_positive,x="Word",y="Frequency", title="top +ve words")
negative_figure=px.bar(df_negative,x="Word",y="Frequency", title="top -ve words")
neutral_figure=px.bar(df_neutral,x="Word",y="Frequency", title="top neutral words")

positive_figure.show()
negative_figure.show()
neutral_figure.show()
```

top +ve words



top -ve words



top neutral words



average Sentiment

```
In [24]: average_sentiment=sum(sentiment_scores)/len(sentiment_scores)
print('average_sentiment_score', average_sentiment)
print('average sentiment score is netural')
```

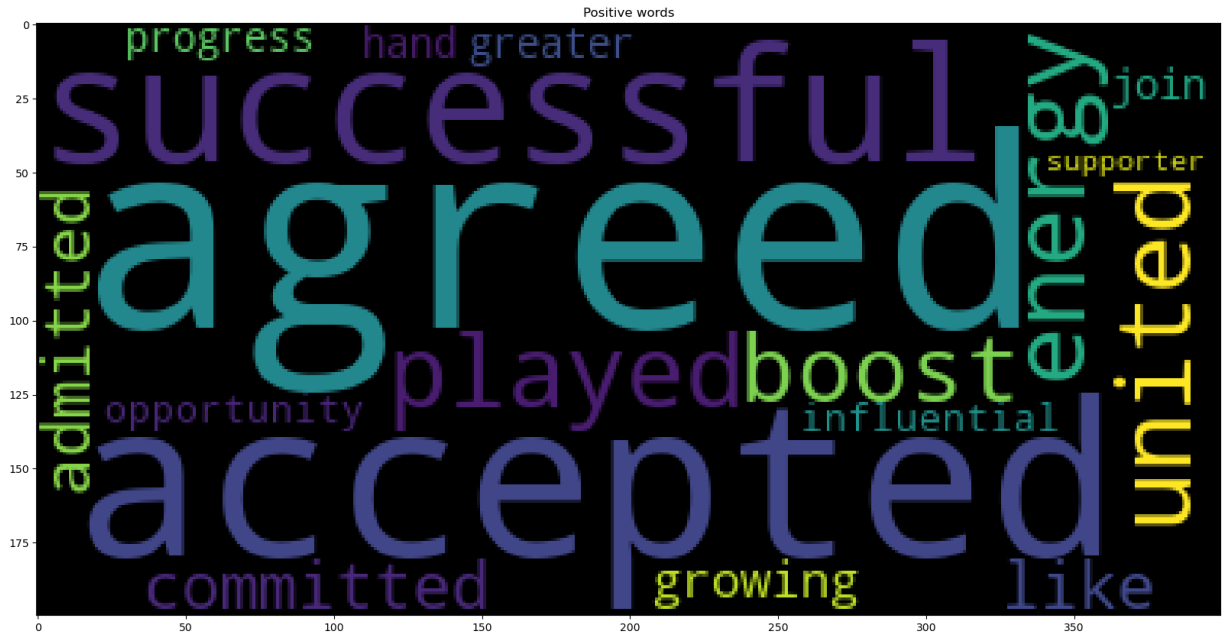
```
average_sentiment_score 0.007663101604278074
average sentiment score is netural
```

wordcloud

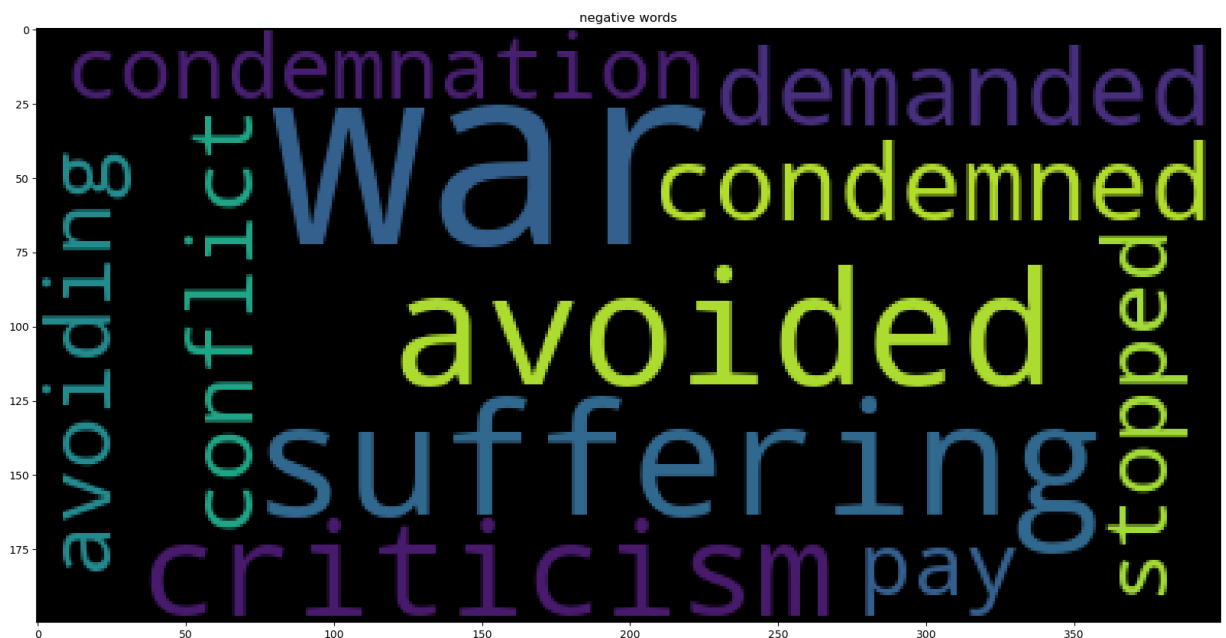
```
In [25]: from wordcloud import WordCloud
```

```
In [26]: wordcloud_positive=WordCloud().generate_from_frequencies(positive_word_freq)
wordcloud_negative=WordCloud().generate_from_frequencies(negative_word_freq)
wordcloud_neutral=WordCloud().generate_from_frequencies(neutral_word_freq)
```

```
In [27]: plt.figure(figsize=(20,15))  
plt.imshow(wordcloud_positive)  
plt.title("Positive words")  
plt.show()
```



```
In [28]: plt.figure(figsize=(20,15))  
plt.imshow(wordcloud_negative)  
plt.title("negative words")  
plt.show()
```



```
In [29]: plt.figure(figsize=(20,15))
plt.imshow(wordcloud_neutral)
plt.title("neutral words")
plt.show()
```



Conclusion

The objective of this project was to do Sentiment Analysis and to categorize text under Positive, Negative & Neutral.

The average sentiment score is 0.00766 which makes the average sentiment Nutral.

In []:

In []: