

PRODUCT FEEDBACK ANALYSIS

Social Media is playing an important role in marketing of a product. This social media can also be used to know the customer's opinions on improvising the product's features, it's quality and many other things.

Sentimental Analysis can roughly give us an idea about the future demand of the product which can help us in increasing the revenue and cutting down on manufacturing costs.

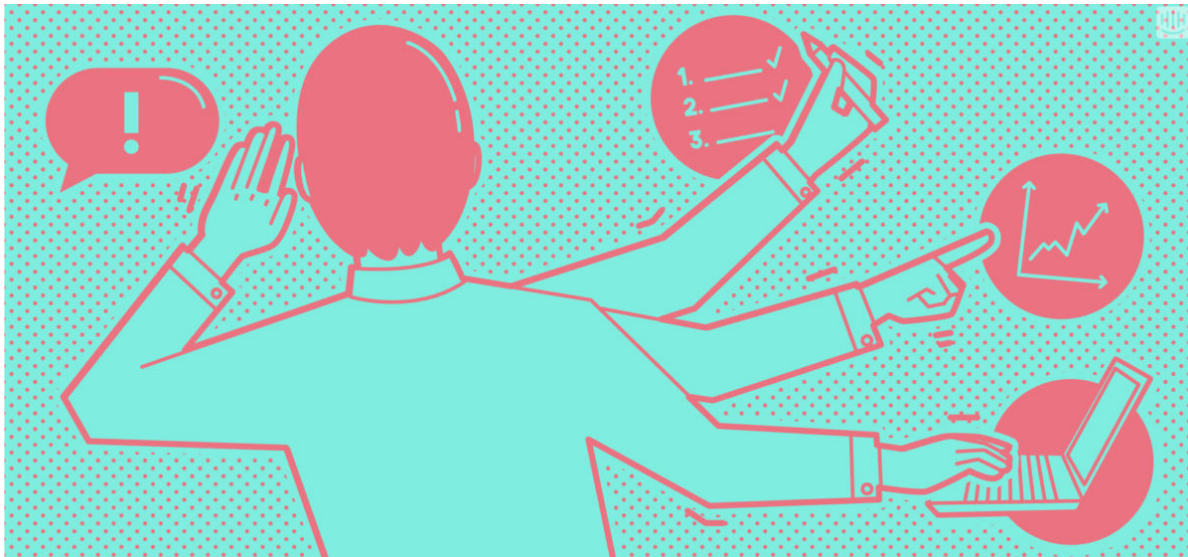
In the Jupyter Notebook, we will do the sentimental analysis on a car model and for analysis purpose we will take the comments as the data from it's Facebook post.

We will use Python libraries along with Facebook Graph API to achieve our goal.

In [10]:

```
from IPython.display import Image  
Image("/Users/saurabhkarambalkar/Desktop/Picture.jpg", width=1000)
```

Out[10]:



Business Aspects

- Reduce the Manufacturing units and cost of the product
- Improve the quality of product by taking the feedback from the customers

Assumptions

- The assumptions for the following analysis is that all the reviews provided by the customers are authentic and unbiased

Limitations

- The API provides limited access to the data due to which the models don't have much data to be trained upon
- If all the reviews given by the customers turn out to be facts, sentiment analysis could not be carried out on the data

Facebook

```
In [5]: import pandas as pd
import numpy as np
import facebook
```

```
In [71]: graph = facebook.GraphAPI(access_token="EAACcYJ4a3rQBAJhxgkoqEy6aNGmj5QdTMLsOxqXp
```

```
In [105]: ##### Get comments from post
post = graph.get_object(id='10155966298429003', fields='comments')
print(post)
```

climate control and more colour range along with features in the Lagoon model), but if they don't it may see me head elsewhere.', 'id': '10155966298429003_10156016415394003'}, {'created_time': '2018-03-13T06:10:17+0000', 'message': 'Im really interested in the 190kw Amorok thats pending, what the decide

r will be is the the addons that VW charge for or cant provide which are offered on other makes.', 'id': '10155966298429003_10156015940514003'}, {'created_time': '2018-03-14T03:42:18+0000', 'message': 'Need a manual in the Polo GTI, can't believe they aren't bringing it in, some\nOf us actually\nLike to drive still!!!!!!', 'id': '10155966298429003_10156018690074003'}, {'created_time': '2018-03-14T02:05:34+0000', 'message': "Does it come with digital radio? And where is the cool colour coded dashboard that the overseas models get?? Looks like the Australian model has half the features of the 'overseas model shown' once again.", 'id': '10155966298429003_10156018458049003'}, {'created_time': '2018-03-15T14:28:46+0000', 'message': "Nice cars pitty but the real good cars are over priced to me... the company itself can't be trusted to tell the truth either... more issues with the emissions recently.. being to high still after VW lied initially to cheat on the emissions compliance criteria...and many friends with DSG gearbox issues... my Commodores, my latest being 5 months old, have been more reliable.", 'id': '10155966298429003_10156022445220003'}, {'created_time': '2018-03-13T22:15:26+0000', 'message':

```
In [107]: data = post['comments']['data']
len(data)
```

Out[107]: 25

```
In [119]: messages=[]
for i in data:
    messages.append(i['message'])
    #messages.append(i['id'])
messages
```

```
Out[119]: ['Except climate control. Apparently it's too high tech for 2018. The 77TSI came with climate control NINE years ago! Talk about a massive leap backwards.',
'Never never ever would I buy another Volkswagen. My polo is a lemon. Onto my second timing chain at only 60,000 kms and just been told I need another gearbo x replacement. No thanks.',
'So much tech except for the rear brakes, which are drum brakes, in 2018...
☹️',
'Will the GTI be available in Manual?',
'So now they're copying Kia.',
'Will it have digital radio?? We are in 2018 now...',
'I reckon the exterior styling is looking better than the Golf these days 😊',
'So is the Polo GTI coming in manual?',
'It's a gorgeous looking car both inside and out but is lacking in a few features; including dual zone climate control (as available in other markets) and a larger range in colours (sorry VW, I don't want orange but a blue would be nice). I am also wondering if when the launch goes, what will be the top non GTI model with features, as the launch offers many added features not on the comfort line? I am not ready to buy now, but I will in about a year if all the stars align (digital display, climate control and more colour range along with features in the Launch model), but if they don't it may see me head elsewhere.',
'Im really interested in the 190kw Amorok thats pending, what the decider will be is the the addons that VW charge for or cant provide which are offered on other makes.',
'Need a manual in the Polo GTI, can't believe they aren't bringing it in, some of us actually\nLike to drive still!!!!',
'Does it come with digital radio? And where is the cool colour coded dashboard that the overseas models get?? Looks like the Australian model has half the features of the 'overseas model shown' once again.',
'Nice cars pitty but the real good cars are over priced to me... the company itself can't be trusted to tell the truth either... more issues with the emissions recently.. being to high still after VW lied initially to cheat on the emissions compliance criteria...and many friends with DSG gearbox issues... my Commodores, my latest being 5 months old, have been more reliable.',
'I'd be happy with an up! GTI thanks Volkswagen AU',
'Harrison I don't see the point of buying a small car and getting extras/options. May as well get a better car with no options.',
'Need a manual in the GTI!!!!',
'Interior typically VW the best!',
'That looks like an archaic 2000s interior with an iPad tacked on...',
'I'd just like to know how to get the heater matrix out of the MK5",
'Tech shouldn't be a feature but a standard offering any car manufacturer.",
'Braden Schoell It looks like the Shot you got of Cody's car',
'maybe we should start carpooling Joanne 😊',
'Eugene Tang when a polo has a more interesting interior than the arteon lol',
'Love a company that tests on monkeys\nRevolting- pond scum putrid',
'Do they still use BSG ( think thats the name) auto boxes, garbage, and upwards of $5000 to repair!!']
```

```
In [240]: Facebook_Messages=pd.DataFrame()
Facebook_Messages['Messages']=messages
Facebook_Messages
```

Out[240]:

	Messages
0	Except climate control. Apparently it's too hi...
1	Never never ever would I buy another Volkswage...
2	So much tech except for the rear brakes, which...
3	Will the GTI be available in Manual?
4	So now they're copying Kia.
5	Will it have digital radio?? We are in 2018 no...
6	I reckon the exterior styling is looking bette...
7	So is the Polo GTI coming in manual?
8	It's a gorgeous looking car both inside and ou...
9	Im really interested in the 190kw Amorok thats...
10	Need a manual in the Polo GTI, can't believe t...
11	Does it come with digital radio? And where is ...
12	Nice cars pitty but the real good cars are ove...
13	I'd be happy with an up! GTI thanks Volkswagen AU
14	Harrison I don't see the point of buying a sma...
15	Need a manual in the GTI!!!!
16	Interior typically V W the best!
17	That looks like an archaic 2000s interior with...
18	I'd just like to know how to get the heater ma...
19	Tech shouldn't be a feature but a standard off...
20	Braden Schoell It looks like the Shot you got ...
21	maybe we should start carpooling Joanne 🤔
22	Eugene Tang when a polo has a more interesting...
23	Love a company that tests on monkeys\nRevoltin...
24	Do they still use BSG (think thats the name) ...

```
In [218]: import json
from pandas.io.json import json_normalize
```

```
In [219]: df1=pd.DataFrame(messages)
df1
```

Out[219]:

0

```
0      Except climate control. Apparently it's too hi...
1      Never never ever would I buy another Volkswage...
2      So much tech except for the rear brakes, which...
3      Will the GTI be available in Manual?
4      So now they're copying Kia.
5      Will it have digital radio?? We are in 2018 no...
6      I reckon the exterior styling is looking bette...
7      So is the Polo GTI coming in manual?
8      It's a gorgeous looking car both inside and ou...
9      Im really interested in the 190kw Amorok thats...
10     Need a manual in the Polo GTI, can't believe t...
11     Does it come with digital radio? And where is ...
12     Nice cars pitty but the real good cars are ove...
13     I'd be happy with an up! GTI thanks Volkswagen AU
14     Harrison I don't see the point of buying a sma...
15     Need a manual in the GTI!!!!
16     Interior typically V W the best!
17     That looks like an archaic 2000s interior with...
18     I'd just like to know how to get the heater ma...
19     Tech shouldn't be a feature but a standard off...
20     Braden Schoell It looks like the Shot you got ...
21     maybe we should start carpooling Joanne 🤪
22     Eugene Tang when a polo has a more interesting...
23     Love a company that tests on monkeys\nRevoltin...
24     Do they still use BSG ( think thats the name) ...
```

```
In [220]: import textblob as tb
from textblob import TextBlob
```

```
In [221]: comments=df1[0]
comments
```

```
Out[221]: 0    Except climate control. Apparently it's too hi...
1    Never never ever would I buy another Volkswage...
2    So much tech except for the rear brakes, which...
3           Will the GTI be available in Manual?
4           So now they're copying Kia.
5    Will it have digital radio?? We are in 2018 no...
6    I reckon the exterior styling is looking bette...
7           So is the Polo GTI coming in manual?
8    It's a gorgeous looking car both inside and ou...
9    Im really interested in the 190kw Amorok thats...
10   Need a manual in the Polo GTI, can't believe t...
11   Does it come with digital radio? And where is ...
12   Nice cars pitty but the real good cars are ove...
13   I'd be happy with an up! GTI thanks Volkswagen AU
14   Harrison I don't see the point of buying a sma...
15           Need a manual in the GTI!!!!
16           Interior typically V W the best!
17   That looks like an archaic 2000s interior with...
18   I'd just like to know how to get the heater ma...
19   Tech shouldn't be a feature but a standard off...
20   Braden Schoell It looks like the Shot you got ...
21           maybe we should start carpooling Joanne 🤪
22   Eugene Tang when a polo has a more interesting...
23   Love a company that tests on monkeys\nRevoltin...
24   Do they still use BSG ( think thats the name) ...
Name: 0, dtype: object
```

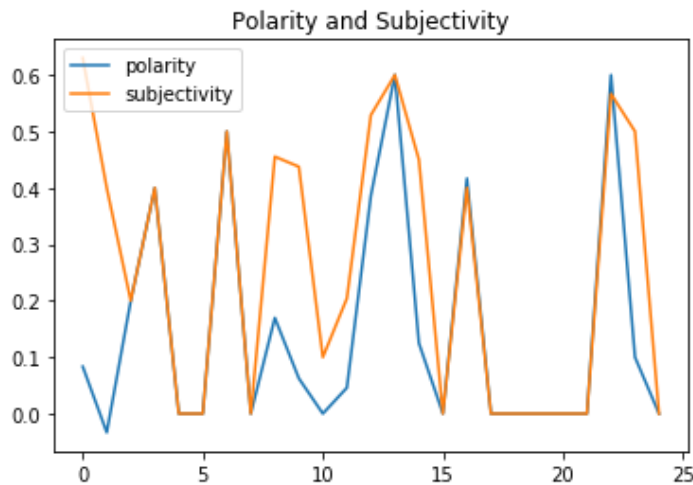
```
In [224]: cm1=comments[8]
blob=TextBlob(cm1)
blob.sentiment
```

```
Out[224]: Sentiment(polarity=0.16964285714285715, subjectivity=0.45535714285714285)
```

```
In [159]: import matplotlib.pyplot as plot
%matplotlib inline
polarity=[]
subj=[]
for t in commennts:
    tx=TextBlob(t)
    polarity.append(tx.sentiment.polarity)
    subj.append(tx.sentiment.subjectivity)
```

```
In [160]: poltweet= pd.DataFrame({'polarity':polarity,'subjectivity':subj})
          poltweet.plot(title='Polarity and Subjectivity')
```

```
Out[160]: <matplotlib.axes._subplots.AxesSubplot at 0x24553a5d5c0>
```



```
In [161]: list=[]
          list= comments
          wordstring = list
          wordstring
```

```
Out[161]: 0    Except climate control. Apparently it's too hi...
          1    Never never ever would I buy another Volkswage...
          2    So much tech except for the rear brakes, which...
          3           Will the GTI be available in Manual?
          4           So now they're copying Kia.
          5    Will it have digital radio?? We are in 2018 no...
          6    I reckon the exterior styling is looking bette...
          7           So is the Polo GTI coming in manual?
          8    It's a gorgeous looking car both inside and ou...
          9    Im really interested in the 190kw Amorok thats...
          10   Need a manual in the Polo GTI, can't believe t...
          11   Does it come with digital radio? And where is ...
          12   Nice cars pitty but the real good cars are ove...
          13   I'd be happy with an up! GTI thanks Volkswagen AU
          14   Harrison I don't see the point of buying a sma...
          15           Need a manual in the GTI!!!!
          16           Interior typically V W the best!
          17   That looks like an archaic 2000s interior with...
          18   I'd just like to know how to get the heater ma...
          19   Tech shouldn't be a feature but a standard off...
          20   Braden Schoell It looks like the Shot you got ...
          21           maybe we should start carpooling Joanne 🤔
          22   Eugene Tang when a polo has a more interesting...
          23   Love a company that tests on monkeys\nRevoltin...
          24   Do they still use BSG ( think thats the name) ...
          Name: 0, dtype: object
```

Twitter

```
In [168]: import numpy as np
import pandas as pd
```

```
In [169]: import twitter
from twitter import Twitter
from twitter import OAuth
from twitter import TwitterHTTPError
from twitter import TwitterStream
```

```
In [170]: ck= 'hq1ikoFrNoXH32vVwH4tdYewd'
cs= 'UpsUIWyTXNtOoKGCuQZw7dQ9L02lzx5vxnw069g4gg9BGfwl3Z'
at= '753638455-fQJkPQDV4aDaFISatU7ZjRBjf4UMb2ufYyKSI2bU'
ats= 'Cjym1sTksiwAKp7Zeh78ngdqZYUI29r981Dw4eFqMCJ4e'
```

```
In [172]: oauth= OAuth(at,ats,ck,cs)
twit_api=Twitter(auth=oauth)
t_loc= twit_api.trends.available()
t_loc
ts= TwitterStream(auth=oauth)
```

```
In [173]: iterator = ts.statuses.filter(track="Volkswagen",language="en")
```



```
In [174]: b=[]
for t in iterator:
    print(t)
    b.append(t)
    if len(b)==25:
        break
```

tatus': False, 'quote_count': 0, 'reply_count': 0, 'retweet_count': 0, 'favorite_count': 0, 'entities': {'hashtags': [], 'urls': [{'url': 'https://t.co/ULZ7l6rx9e', 'expanded_url': 'https://buff.ly/2JYSzp8', 'display_url': 'buff.ly/2JYSzp8', 'indices': [43, 66]}], 'user_mentions': [], 'symbols': [], 'media': [{'id': 989354157000839168, 'id_str': '989354157000839168', 'indices': [67, 90], 'media_url': 'http://pbs.twimg.com/media/DbrkXS0XUAAQQ09.jpg', 'media_url_https': 'https://pbs.twimg.com/media/DbrkXS0XUAAQQ09.jpg', 'url': 'https://t.co/htGeYyIKi7', 'display_url': 'pic.twitter.com/htGeYyIKi7', 'expanded_url': 'https://twitter.com/Equipment_World/status/989354159328636928/photo/1', 'type': 'photo', 'sizes': {'thumb': {'w': 150, 'h': 150, 'resize': 'crop'}, 'large': {'w': 825, 'h': 519, 'resize': 'fit'}, 'medium': {'w': 825, 'h': 519, 'resize': 'fit'}, 'small': {'w': 680, 'h': 428, 'resize': 'fit'}}}], 'extended_entities': {'media': [{'id': 989354157000839168, 'id_str': '989354157000839168', 'indices': [67, 90], 'media_url': 'http://pbs.twimg.com/media/DbrkXS0XUAAQQ09.jpg', 'media_url_https': 'https://pbs.twimg.com/media/DbrkXS0XUAAQQ09.jpg', 'url': 'https://t.co/htGeYyIKi7', 'display_url': 'pic.twitter.com/htGeYyIKi7', 'expanded_url': 'https://twitter.com/Equipment_World/status/989354159328636928/photo/1', 'type': 'photo', 'sizes': {'thumb': {'w': 150, 'h': 150, 'resize': 'crop'}, 'large': {'w': 825, 'h': 519, 'resize': 'fit'}, 'medium': {'w': 825, 'h': 519, 'resize': 'fit'}, 'sm

```
In [175]: len(b)
```

```
Out[175]: 25
```

```
In [176]: import json
from pandas.io.json import json_normalize
```

```
In [177]: df=json_normalize(b)
df.head()
```

Out[177]:

s.media	entities.symbols	entities.urls	...	user.profile_text_color	user.profile_use_backgro
NaN	[]	[]	...	333333	
NaN	[]	[]	...	333333	
{'id': 707008, 93503...	[]	{'url': 'https://t.co/ZFt0sdlc35', 'expanded_...	...	333333	
NaN	[]	{'url': 'https://t.co/6SFP54djRY', 'expanded_...	...	000000	
NaN	[]	{'url': 'https://t.co/HMhISXUR52', 'expanded_...	...	333333	

```
In [178]: # TextBlob
import textblob as tb
from textblob import TextBlob
```

```
In [179]: !python -m textblob.download_corpora
```

```
[nltk_data] Downloading package brown to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package brown is already up-to-date!  
[nltk_data] Downloading package punkt to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package punkt is already up-to-date!  
[nltk_data] Downloading package wordnet to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package wordnet is already up-to-date!  
[nltk_data] Downloading package averaged_perceptron_tagger to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package averaged_perceptron_tagger is already up-to-  
[nltk_data]   date!  
[nltk_data] Downloading package conll2000 to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package conll2000 is already up-to-date!  
[nltk_data] Downloading package movie_reviews to  
[nltk_data]   C:\Users\viki4\AppData\Roaming\nltk_data...  
[nltk_data]   Package movie_reviews is already up-to-date!  
Finished.
```

```
In [180]: tweettext=df['text']
```

```
In [189]: tx=tweettext[16]  
blob=TextBlob(tx)  
tx
```

```
Out[189]: 'Forget #Netflix - get 6-months Amazon Prime Video totally #FREE https://t.co/gdtm7a3CEw (https://t.co/gdtm7a3CEw) #Ware #motivation... https://t.co/pUycrBeNC1'  
(https://t.co/pUycrBeNC1)'
```

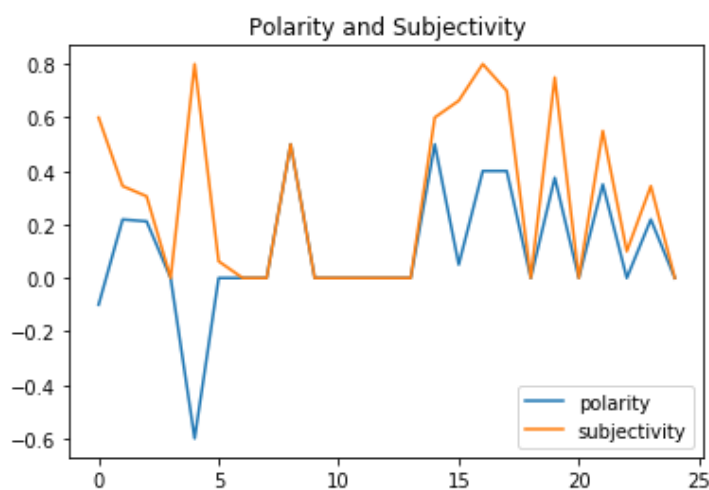
```
In [190]: blob.sentiment
```

```
Out[190]: Sentiment(polarity=0.4, subjectivity=0.8)
```

```
In [183]: # Plot Sentiments
import matplotlib.pyplot as plot
%matplotlib inline
polarity=[]
subj=[]
for t in tweettext:
    tx=TextBlob(t)
    polarity.append(tx.sentiment.polarity)
    subj.append(tx.sentiment.subjectivity)

poltweet= pd.DataFrame({'polarity':polarity,'subjectivity':subj})
poltweet.plot(title='Polarity and Subjectivity')
```

Out[183]: <matplotlib.axes._subplots.AxesSubplot at 0x24642814b00>



```
In [191]: list=[]
list= df['text']
wordstring = list[0]
wordstring
```

Out[191]: "RT @FredNBCLA: Are the #Dodgers jammed into a Volkswagen because it looks like they're coming out of a clown car.."

```
In [192]: n=1
while n < 25:
    wordstring += list[n]
    n=n+1
```

```
In [193]: wordstring
wordlist = wordstring.split()
```

```
In [194]: tweettext=df['text']
```

```
In [195]: blob=TextBlob(wordstring)
blob
```

```
Out[195]: TextBlob("RT @FredNBCLA: Are the #Dodgers jammed into a Volkswagen because it l
ooks like they're coming out of a clown car..RT @cebit: Volkswagen at CEBIT! As
present as never before - we are excited about many innovations of future mobil
ity! #CEBIT18 #futuremobi...eBay: 1967 Volkswagen Beetle - Classic Standard Orig
inal 1967 VW Bug.....ONE OWNER! https://t.co/ZFt0sdlc35 (https://t.co/ZFt0sdlc3
5) https://t.co/YMla2kTOvZVW (https://t.co/YMla2kTOvZVW) 1300 VW1300 script bad
ge emblem logo Price: 45 - https://t.co/6SFP54djRY (https://t.co/6SFP54djRY)
#VW #volkswagen #flat4 #Coccinelle... https://t.co/d8hinJE8vi"It's (https://t.c
o/d8hinJE8vi"It's) not going to judge you like a fucking Volkswagen would" 🐼 h
ttps://t.co/HMh1SXUR52RT (https://t.co/HMh1SXUR52RT) @vwpress_en: #VWGroup CEO
Diess speaks at the #VWpressconference about Volkswagen's future plans for the
Chinese market. #AutoChina #Bei...SEDAN Bandai Toys Co, battery operated,VOLKSWA
GEN KING SIZE REF. 4084 https://t.co/4I4MbvuH5Z (https://t.co/4I4MbvuH5Z) http
s://t.co/29wYIqWoPwMaryland (https://t.co/29wYIqWoPwMaryland) reaches $33.5 mil
lion ... https://t.co/1vqBpkvClT (https://t.co/1vqBpkvClT) #BankruptcyPersona
l #BusinessFinance #BusinessLaw #BusinessLawGeneral@CNMoney FORD can go ahead
with that ... Volkswagen needs the business (and they build better cars)Maryl
and reaches $33.5 million ... https://t.co/1vqBpkvClT (https://t.co/1vqBpkvClT)
https://t.co/J31D234tfq (https://t.co/J31D234tfq) #BankruptcyPersonal... http
s://t.co/J1ok677ZioFront (https://t.co/J1ok677ZioFront) hood VW emblem 11385360
1B Price: 25 - https://t.co/Dc3gIU34ft (https://t.co/Dc3gIU34ft) #VW #volkswa
gen #flat4 #Coccinelle #Cox... https://t.co/qgQxOQfB0RThe (https://t.co/qgQxOQfB0
RThe) price has changed on our 2009 Volkswagen GTI. Take a look: https://t.co/U
Fdpezgfi4The (https://t.co/UFdpezgfi4The) price for 2009 Volkswagen GTI is $7,9
99 now. Take a look: https://t.co/UFdpezgfi4The (https://t.co/UFdpezgfi4The) pr
ice has changed on our 2005 Volkswagen Jetta. Take a look: https://t.co/4uu06xL
uKnI (https://t.co/4uu06xLuKnI) love you all ❤️❤️❤️❤️❤️ #volkswagen #vw #l
ove #foreign @ Milwaukee, Wisconsin https://t.co/i7KK4pgKEc@skotterbutt (http
s://t.co/i7KK4pgKEc@skotterbutt) I'm not sure any of that is a benefit. lol. bu
t it is the game i play too with my 288k mile volkswagenForget #Netflix - get 6
-months Amazon Prime Video totally #FREE https://t.co/gdtm7a3CEw (https://t.co/
gdtm7a3CEw) #Ware #motivation... https://t.co/pUycrBeNC1NOS (https://t.co/pUycrBe
NC1NOS) license light bulb holder Price: 39eur - https://t.co/mZBVNmzHPe (htt
ps://t.co/mZBVNmzHPe) #VW #volkswagen #flat4 #Coccinelle #Cox... https://t.co/u5q
wUGFmHLNOS (https://t.co/u5qwUGFmHLNOS) crankshaft 1500/1600 Price: 200eur -
https://t.co/UZFkxoVX2V (https://t.co/UZFkxoVX2V) #VW #volkswagen #flat4 #Cocci
nelle #Cox #Spain... https://t.co/qhW7sa72MFOriginal (https://t.co/qhW7sa72MFOrig
inal) Headlight Rims Rechromed Beetle Oval Price: £110 - https://t.co/jHazRlN
s1o (https://t.co/jHazRlNs1o) #VW #volkswagen #flat4... https://t.co/InD90XzJDVTh
e (https://t.co/InD90XzJDVThe) price for 2005 Volkswagen Jetta is $4,999 now. T
ake a look: https://t.co/4uu06xLuKnRT (https://t.co/4uu06xLuKnRT) @EuropeanCarN
ews: #Volkswagen I.D. R basking in the sun. Full story coming soon on @DigitalT
rends. | @VW https://t.co/8ivvjaLzwjVolkswagen (https://t.co/8ivvjaLzwjVolkswag
en) goes big on Roadmap E https://t.co/L8LBrcd715 (https://t.co/L8LBrcd715) htt
ps://t.co/ad2DWJ1bBCRT (https://t.co/ad2DWJ1bBCRT) @cebit: Volkswagen at CEBIT!
As present as never before - we are excited about many innovations of future m
obility! #CEBIT18 #futuremobi...Volkswagen exec hints at Navistar takeover http
s://t.co/ULZ716rx9e (https://t.co/ULZ716rx9e) https://t.co/htGeYyIKi7") (http
s://t.co/htGeYyIKi7"))
```

```
In [203]: df_twit = pd.DataFrame()
df_twit['data']=tweettext
df_twit
```

Out[203]:

	data
0	RT @FredNBCLA: Are the #Dodgers jammed into a ...
1	RT @cebit: Volkswagen at CEBIT! As present as ...
2	eBay: 1967 Volkswagen Beetle - Classic Standar...
3	VW 1300 VW1300 script badge emblem logo Pric...
4	"It's not going to judge you like a fucking Vo...
5	RT @vwpress_en: #VWGroup CEO Diess speaks at t...
6	SEDAN Bandai Toys Co, battery operated,VOLKSWA...
7	Maryland reaches \$33.5 million ... https://t.c...
8	@CNMMoney FORD can go ahead with that ... Volk...
9	Maryland reaches \$33.5 million ... https://t.c...
10	Front hood VW emblem 113853601B Price: 25 - ...
11	The price has changed on our 2009 Volkswagen G...
12	The price for 2009 Volkswagen GTI is \$7,999 no...
13	The price has changed on our 2005 Volkswagen J...
14	I love you all ❤❤❤❤❤❤ #volkswagen #vw #love #f...
15	@skotterbutt I'm not sure any of that is a ben...
16	Forget #Netflix – get 6-months Amazon Prime Vi...
17	NOS license light bulb holder Price: 39eur -...
18	NOS crankshaft 1500/1600 Price: 200eur - htt...
19	Original Headlight Rims Rechromed Beetle Oval ...
20	The price for 2005 Volkswagen Jetta is \$4,999 ...
21	RT @EuropeanCarNews: #Volkswagen I.D. R baskin...
22	Volkswagen goes big on Roadmap E https://t.co/...
23	RT @cebit: Volkswagen at CEBIT! As present as ...
24	Volkswagen exec hints at Navistar takeover htt...

```
In [211]: import re
import nltk
nltk.download('stopwords')
from nltk.corpus import stopwords
from nltk.stem.porter import PorterStemmer
```

```
[nltk_data] Downloading package stopwords to
[nltk_data] C:\Users\wiki4\AppData\Roaming\nltk_data...
[nltk_data] Package stopwords is already up-to-date!
```

```
In [213]: corpus = []
for i in range(0,24):
    review = re.sub('[^a-zA-Z]', ' ', df_twit['data'][i])
    review = review.lower()
    review = review.split()
    ps = PorterStemmer() # Taking roots of different versions of the same word;
                        # Not to have too many words in the end;
                        # To regroup same versions of the words;
    review = [ps.stem(word) for word in review if not word in set(stopwords.words('english'))]
    review = ' '.join(review)
    corpus.append(review)
corpus
```

```
Out[213]: ['rt frednbcla dodger jam volkswagen look like come clown car',
'rt cebit volkswagen cebit present never excit mani innov futur mobil cebit fu
turemobi',
'ebay volkswagen beetl classic standard origin vw bug one owner http co zft sd
lc http co ymla ktovz',
'vw vw script badg emblem logo price http co sfp djri vw volkswagen flat cocci
nel http co hinj vi',
'go judg like fuck volkswagen would http co hmhlxur',
'rt vwpress en vwgroup ceo diess speak vwpressconfer volkswagen futur plan chi
nes market autochina bei',
'sedan bandai toy co batteri oper volkswagen king size ref http co mbvuh z htt
p co wyiqwopw',
'maryland reach million http co vqbpkvclt bankruptcyperson businessfin busines
slaw businesslawgener',
'cnnmoney ford go ahead volkswagen need busi build better car',
'maryland reach million http co vqbpkvclt http co j tfq bankruptcyperson http
co j ok zio',
'front hood vw emblem b price http co dc giu ft vw volkswagen flat coccinel co
x http co qgqxqfb r',
'price chang volkswagen gti take look http co ufdpezgfi',
'price volkswagen gti take look http co ufdpezgfi',
'price chang volkswagen jetta take look http co uuo xlukn',
'love volkswagen vw love foreign milwauke wisconsin http co kk pgkec',
'skotterbutt sure benefit lol game play k mile volkswagen',
'forget netflix get month amazon prime video total free http co gdtm cew ware
motiv http co puyrbenc',
'no licens light bulb holder price eur http co mzbvnmzhpe vw volkswagen flat c
occinel cox http co u qwugfmhl',
'no crankshaft price eur http co uzfxovx v vw volkswagen flat coccinel cox sp
ain http co qhw sa mf',
'origin headlight rim rechrom beetl oval price http co jhazrln vw volkswagen f
lat http co ind xzjdv',
'price volkswagen jetta take look http co uuo xlukn',
'rt europeancarnew volkswagen r bask sun full stori come soon digitaltrend vw
http co invjalzwj',
'volkswagen goe big roadmap e http co l lbrcd http co ad dwj bbc',
'rt cebit volkswagen cebit present never excit mani innov futur mobil cebit fu
turemobi']
```

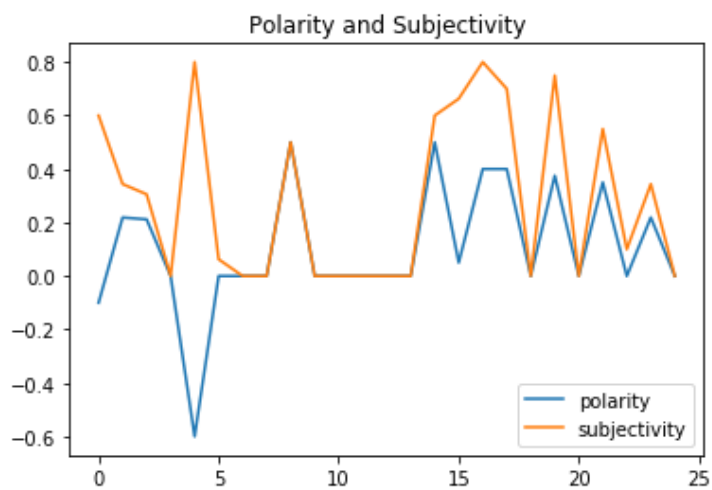
```
In [196]: blob.sentiment
```

```
Out[196]: Sentiment(polarity=0.17841666666666664, subjectivity=0.4412222222222222)
```

```
In [197]: # Plots
import matplotlib.pyplot as plot
%matplotlib inline
polarity=[]
subj=[]
for t in tweettext:
    tx=TextBlob(t)
    polarity.append(tx.sentiment.polarity)
    subj.append(tx.sentiment.subjectivity)

poltweet= pd.DataFrame({'polarity':polarity,'subjectivity':subj})
poltweet.plot(title='Polarity and Subjectivity')
```

Out[197]: <matplotlib.axes._subplots.AxesSubplot at 0x246441784a8>




```
In [245]: combined_data=pd.DataFrame()
combined_data=pd.concat([df_twit['data'],Facebook_Messages['Messages']],ignore_in
combined_data
```

```
Out[245]: 0 RT @FredNBCLA: Are the #Dodgers jammed into a ...
1 RT @cebit: Volkswagen at CEBIT! As present as ...
2 eBay: 1967 Volkswagen Beetle - Classic Standar...
3 VW 1300 VW1300 script badge emblem logo Pric...
4 "It's not going to judge you like a fucking Vo...
5 RT @vwpress_en: #VWGroup CEO Diess speaks at t...
6 SEDAN Bandai Toys Co, battery operated,VOLKSWA...
7 Maryland reaches $33.5 million ... https://t.c... (https://t.c...)
8 @CNNMoney FORD can go ahead with that ... Volk...
9 Maryland reaches $33.5 million ... https://t.c... (https://t.c...)
10 Front hood VW emblem 113853601B Price: 25 - ...
11 The price has changed on our 2009 Volkswagen G...
12 The price for 2009 Volkswagen GTI is $7,999 no...
13 The price has changed on our 2005 Volkswagen J...
14 I love you all ❤❤❤❤❤❤ #volkswagen #vw #love #f...
15 @skotterbutt I'm not sure any of that is a ben...
16 Forget #Netflix - get 6-months Amazon Prime Vi...
17 NOS license light bulb holder Price: 39eur -...
18 NOS crankshaft 1500/1600 Price: 200eur - htt...
19 Original Headlight Rims Rechromed Beetle Oval ...
20 The price for 2005 Volkswagen Jetta is $4,999 ...
21 RT @EuropeanCarNews: #Volkswagen I.D. R baskin...
22 Volkswagen goes big on Roadmap E https://t.co/... (https://t.co/...)
23 RT @cebit: Volkswagen at CEBIT! As present as ...
24 Volkswagen exec hints at Navistar takeover htt...
25 Except climate control. Apparently it's too hi...
26 Never never ever would I buy another Volkswage...
27 So much tech except for the rear brakes, which...
28 Will the GTI be available in Manual?
29 So now they're copying Kia.
30 Will it have digital radio?? We are in 2018 no...
31 I reckon the exterior styling is looking bette...
32 So is the Polo GTI coming in manual?
33 It's a gorgeous looking car both inside and ou...
34 Im really interested in the 190kw Amorok thats...
35 Need a manual in the Polo GTI, can't believe t...
36 Does it come with digital radio? And where is ...
37 Nice cars pitty but the real good cars are ove...
38 I'd be happy with an up! GTI thanks Volkswagen AU
39 Harrison I don't see the point of buying a sma...
40 Need a manual in the GTI!!!!
41 Interior typically V W the best!
42 That looks like an archaic 2000s interior with...
43 I'd just like to know how to get the heater ma...
44 Tech shouldn't be a feature but a standard off...
45 Braden Schoell It looks like the Shot you got ...
46 maybe we should start carpooling Joanne 🤪
47 Eugene Tang when a polo has a more interesting...
48 Love a company that tests on monkeys\nRevoltin...
49 Do they still use BSG ( think thats the name) ...
dtype: object
```

```
In [278]: combined_data['Messages']=combined_data[0]
```

In [253]: combined_data

```

Out[253]: 0      RT @FredNBCLA: Are the #Dodgers jammed into a ...
1      RT @cebit: Volkswagen at CEBIT! As present as ...
2      eBay: 1967 Volkswagen Beetle - Classic Standar...
3      VW 1300 VW1300 script badge emblem logo Pric...
4      "It's not going to judge you like a fucking Vo...
5      RT @vwpress_en: #VWGroup CEO Diess speaks at t...
6      SEDAN Bandai Toys Co, battery operated,VOLKSWA...
7      Maryland reaches $33.5 million ... https://t.c... (https://t.c...)
8      @CNMoney FORD can go ahead with that ... Volk...
9      Maryland reaches $33.5 million ... https://t.c... (https://t.c...)
10     Front hood VW emblem 113853601B Price: 25 - ...
11     The price has changed on our 2009 Volkswagen G...
12     The price for 2009 Volkswagen GTI is $7,999 no...
13     The price has changed on our 2005 Volkswagen J...
14     I love you all ❤❤❤❤❤❤❤ #volkswagen #vw #love #f...
15     @skotterbutt I'm not sure any of that is a ben...
16     Forget #Netflix - get 6-months Amazon Prime Vi...
17     NOS license light bulb holder Price: 39eur -...
18     NOS crankshaft 1500/1600 Price: 200eur - htt...
19     Original Headlight Rims Rechromed Beetle Oval ...
20     The price for 2005 Volkswagen Jetta is $4,999 ...
21     RT @EuropeanCarNews: #Volkswagen I.D. R baskin...
22     Volkswagen goes big on Roadmap E https://t.co/... (https://t.c...
o/...)
23     RT @cebit: Volkswagen at CEBIT! As present as ...
24     Volkswagen exec hints at Navistar takeover htt...
25     Except climate control. Apparently it's too hi...
26     Never never ever would I buy another Volkswage...
27     So much tech except for the rear brakes, which...
28         Will the GTI be available in Manual?
29         So now they're copying Kia.
30     Will it have digital radio?? We are in 2018 no...
31     I reckon the exterior styling is looking bette...
32         So is the Polo GTI coming in manual?
33     It's a gorgeous looking car both inside and ou...
34     Im really interested in the 190kw Amorok thats...
35     Need a manual in the Polo GTI, can't believe t...
36     Does it come with digital radio? And where is ...
37     Nice cars pitty but the real good cars are ove...
38     I'd be happy with an up! GTI thanks Volkswagen AU
39     Harrison I don't see the point of buying a sma...
40         Need a manual in the GTI!!!!
41         Interior typically V W the best!
42     That looks like an archaic 2000s interior with...
43     I'd just like to know how to get the heater ma...
44     Tech shouldn't be a feature but a standard off...
45     Braden Schoell It looks like the Shot you got ...
46         maybe we should start carpooling Joanne 🚗
47     Eugene Tang when a polo has a more interesting...
48     Love a company that tests on monkeys\nRevoltin...
49     Do they still use BSG ( think thats the name) ...
Messages RT @FredNBCLA: Are the #Dodgers jammed into a ...
dtype: object

```

```
In [261]: tweettext=combined_data
```

```
In [275]: tx=tweettext[1]
blob=TextBlob(tx)
tx
```

```
Out[275]: 'RT @cebit: Volkswagen at CEBIT! As present as never before - we are excited ab
out many innovations of future mobility! #CEBIT18 #futuremobi...'
```

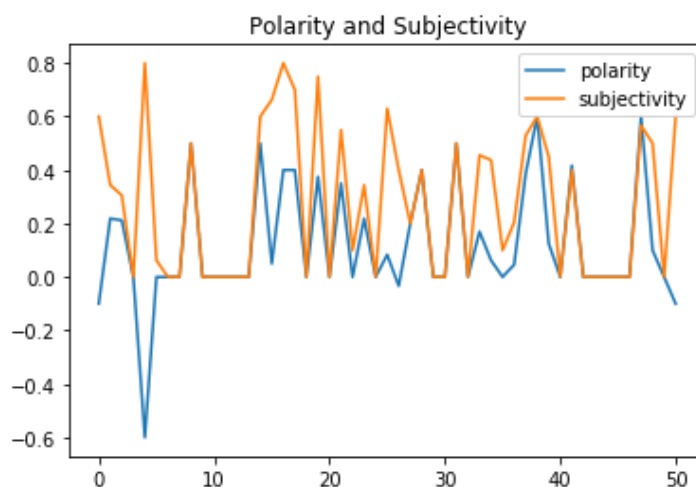
```
In [276]: blob.sentiment
```

```
Out[276]: Sentiment(polarity=0.21875, subjectivity=0.34375)
```

```
In [268]: # Plots
import matplotlib.pyplot as plot
%matplotlib inline
polarity=[]
subj=[]
for t in tweettext:
    tx=TextBlob(t)
    polarity.append(tx.sentiment.polarity)
    subj.append(tx.sentiment.subjectivity)

poltweet= pd.DataFrame({'polarity':polarity,'subjectivity':subj})
poltweet.plot(title='Polarity and Subjectivity')
```

```
Out[268]: <matplotlib.axes._subplots.AxesSubplot at 0x245312faa90>
```



Conclusion and Future Scope

We are planning on sending the feedback from the above analysis to the owners of the

companies, using which they can improve their service, inturn maximizing their profits.