Sample run of Sentiment Analysis of Joke

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In [1]:
```
import requests
import pandas as pd
from bs4 import BeautifulSoup as BS
import os
os.chdir(r'C:\Users\acer\Desktop\PythonProgramming')
```

In [2]:
```
url = 'https://en.wikiquote.org/wiki/The_Dark_Knight_(film)'
page = requests.get(url)
```

In [3]:
```
soup = BS(page.text, 'html.parser')
```

In [4]:
```
#print(soup.prettify())
```

In [5]:
```
scripts = soup.find_all('ul')
joker = scripts[2].find_all('li')
joker
```

```
[<li>I believe that whatever doesn't kill you, simply makes you... <i><b>stranger</b></i>.</li>,
 <li>Do you wanna know how I got these scars?  My father was a drinker, and a fiend.  And one night, he
l.  Mommy gets the kitchen knife to defend herself.  He doesn't like that.  <i>Not. One. Bit</i>. So, m
er, laughing while he does it.  He turns to me, and he says, <b>"Why so serious?"</b>  He comes at me w
S?!</i>"</b>  He sticks the blade in my mouth—<b>"Let's put a <i>smile</i> on that <i>face</i>!"</b>  A
>,
 <li>Don't talk like one of them! You're not - even if you'd like to be. To them, you're just a freak,
ut when they don't, they'll cast you out - like a leper. See, their "morals", their "code"... it's a ba
f trouble.  They're only as good as the world allows them to be. I'll show you. When the chips are down
>They'll <i>eat</i> each other</b>. See, I'm not a monster. I'm just ahead of the curve.</li>,
 <li>You know what I've noticed? Nobody panics when things go "according to plan"... even if the plan i
the press that, like, a gang-banger will get shot, or a truckload of soldiers will be blowing up, nobod
the plan". But I say that <i>one</i> little old mayor will die... <i><b>well then everyone loses their
narchy. Upset the established order, and everything becomes chaos. <b>I'm an agent of chaos</b>. Oh, an
t's <i><b>fair</b></i>.</li>,
 <li>Do I really look like a guy with a plan? You know what I am? I'm a dog chasing cars. I wouldn't kn
it! You know, I just... <i>do</i> things.</li>]
```

In [6]:
```
joker_list = [ii.text for ii in joker]
print(len(joker_list))
```

```
5
```

In [7]:
```
for ii in joker_list:
    print(ii)
    print('--------------')
    print('\n')
```

```
I believe that whatever doesn't kill you, simply makes you... stranger.
--------------


Do you wanna know how I got these scars?  My father was a drinker, and a fiend.  And one night, he goes
s the kitchen knife to defend herself.  He doesn't like that.  Not. One. Bit. So, me watching, he takes
e does it.  He turns to me, and he says, "Why so serious?"  He comes at me with the knife. "Why so SERI
outh—"Let's put a smile on that face!"  Aaaand... Why so serious?
--------------


Don't talk like one of them! You're not - even if you'd like to be. To them, you're just a freak, like
en they don't, they'll cast you out - like a leper. See, their "morals", their "code"... it's a bad jok
uble.  They're only as good as the world allows them to be. I'll show you. When the chips are down, the
eat each other. See, I'm not a monster. I'm just ahead of the curve.
--------------


You know what I've noticed? Nobody panics when things go "according to plan"... even if the plan is hor
ress that, like, a gang-banger will get shot, or a truckload of soldiers will be blowing up, nobody pan
plan". But I say that one little old mayor will die... well then everyone loses their minds! Introduce
shed order, and everything becomes chaos. I'm an agent of chaos. Oh, and you know the thing about chaos
--------------


Do I really look like a guy with a plan? You know what I am? I'm a dog chasing cars. I wouldn't know wh
ou know, I just... do things.
--------------
```

Creating a dataframe.

In [8]:
```
jokerdf = pd.DataFrame({'quote': joker_list})
jokerdf
```

	quote
0	I believe that whatever doesn't kill you, simp...
1	Do you wanna know how I got these scars? My f...
2	Don't talk like one of them! You're not - even...
3	You know what I've noticed? Nobody panics when...
4	Do I really look like a guy with a plan? You k...

Cleaning the text.

- This includes removing non - significant words like 'the', 'a', etc. and some punc
- Stemming: For the word 'loves' or 'loved', we will only choose 'love'.

To learn more about RegEx, CLICK HERE (https://github.com/sagsshakya/Pandas-Notes/blob/master/Regular%20Expressions/Regular_Expressions.ipynb)

Data Cleaning.

- Removing non-word characters.
- Converting all the words into lower case.
- Removing extra spaces.

In [9]:
```
import re
for ii in range(len(jokerdf['quote'])):
    jokerdf['quote'][ii] = re.sub('[^a-zA-Z]', ' ' , jokerdf['quote'][ii], flags
    # We can use '\W' (non - alphanumeric character or non - word character) inst

    #Convert into LowerCase.
    jokerdf['quote'][ii] = jokerdf['quote'][ii].lower()

    # Removing extra spaces.
    jokerdf['quote'][ii] = jokerdf['quote'][ii].replace('    ',' ')
    jokerdf['quote'][ii] = jokerdf['quote'][ii].replace('   ',' ')
    jokerdf['quote'][ii] = jokerdf['quote'][ii].replace('  ',' ')

    print(jokerdf['quote'][ii])
    print('--------------')
    print('\n')
```

```
i believe that whatever doesn t kill you simply makes you stranger
--------------


do you wanna know how i got these scars my father was a drinker and a fiend and one night he goes off c
tchen knife to defend herself he doesn t like that not one bit so me watching he takes the knife to her
to me and he says why so serious he comes at me with the knife why so serious he sticks the blade in my
ce aaaand why so serious
--------------


don t talk like one of them you re not even if you d like to be to them you re just a freak like me the
don t they ll cast you out like a leper see their morals their code it s a bad joke dropped at the firs
ood as the world allows them to be i ll show you when the chips are down these ah civilized people they
nster i m just ahead of the curve
--------------


you know what i ve noticed nobody panics when things go according to plan even if the plan is horrifyin
like a gang banger will get shot or a truckload of soldiers will be blowing up nobody panics because it
hat one little old mayor will die well then everyone loses their minds introduce a little anarchy upset
ng becomes chaos i m an agent of chaos oh and you know the thing about chaos it s fair
--------------


do i really look like a guy with a plan you know what i am i m a dog chasing cars i wouldn t know what
now i just do things
--------------
```

Removing all the non - significant words.

In [10]:
```
import re
import nltk
from nltk.corpus import stopwords
from nltk.stem.porter import PorterStemmer as PS

ps = PS()
```

In [11]:
```
corpus = []
for jj in range(jokerdf.shape[0]):

    # Splitting the string review using a whitespace.
    review = jokerdf['quote'][jj].split()

    # The list of stopwords in the English language can be viewed as:
    mystopper = set(stopwords.words('english'))

    # Stemming.
    review = [ps.stem(ii) for ii in review if not ii in mystopper]

    # Joing the list into a string.
    review = ' '.join(review)

    corpus.append(review)
```

In [12]:
```
corpus
```

```
['believ whatev kill simpli make stranger',
 'wanna know got scar father drinker fiend one night goe crazier usual mommi get kitchen knife defend l
turn say seriou come knife seriou stick blade mouth let put smile face aaaand seriou',
 'talk like one even like freak like need right cast like leper see moral code bad joke drop first sign
ah civil peopl eat see monster ahead curv',
 'know notic nobodi panic thing go accord plan even plan horrifi tomorrow tell press like gang banger g
di panic part plan say one littl old mayor die well everyon lose mind introduc littl anarchi upset esta
t chao oh know thing chao fair',
 'realli look like guy plan know dog chase car know one caught know thing']
```

Creating a dataframe.

In [13]:
```
df_corpus = pd.DataFrame({'stemmed':corpus})
df_corpus.head(10)
```

	stemmed
0	believ whatev kill simpli make stranger
1	wanna know got scar father drinker fiend one n...
2	talk like one even like freak like need right ...
3	know notic nobodi panic thing go accord plan e...
4	realli look like guy plan know dog chase car k...

Creating the Bag of Words Model.

Tokenization:

Taking all the unique words from all the tuples and creating a separate column for e

In [14]:
```
from sklearn.feature_extraction.text import CountVectorizer
```

- class sklearn.feature_extraction.text.CountVectorizer(input='content', encoding=
  strip_accents=None, lowercase=True, preprocessor=None, tokenizer=None, st
  token_pattern='(?u)\b\w\w+\b', ngram_range=(1, 1), analyzer='word', max_df=1
  max_features=None, vocabulary=None, binary=False, dtype=<class 'numpy.int
  (https://scikit-learn.org/stable/modules/generated/sklearn.feature_extraction.tex

In [15]:
```
cv = CountVectorizer()
X = cv.fit_transform(corpus).toarray()
X
```

```
array([[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 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, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 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, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        1, 0],
       [1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        1, 1, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0,
        1, 0, 1, 0, 0, 0, 0, 0, 1, 3, 1, 1, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1,
        0, 0, 1, 0, 1, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 1, 0,
        3, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0,
        0, 0],
       [0, 0, 0, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 1,
        0, 0, 1, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0,
        0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 4, 0, 0, 0, 0, 0, 0, 0,
        1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 2,
        0, 0, 1, 1, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0,
        0, 1],
       [0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 0, 0, 3, 0, 0, 0, 0,
        0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 1, 1, 1,
        0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 2, 0, 0, 0, 1, 2, 0, 1, 0, 1, 1, 0,
        0, 0, 0, 0, 0, 2, 1, 1, 1, 1, 1, 2, 1, 0, 3, 1, 0, 0, 0, 1, 0, 0,
        0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 2, 1, 0, 1, 0, 1, 0, 0, 0, 1,
        0, 0],
       [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0,
        0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0,
        0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0, 0, 0,
        0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
        0, 0]], dtype=int64)
```

In [16]:
```
X.shape
```

```
(5, 112)
```

There are 5 quotes set. And, there are 112 unique words in the bag of word

Sentiment analysis.

1. **TextBlob Module:** Linguistic researchers have labeled the sentiment of words expertise. Sentiment of words can vary based on where it is in a sentence. The to take advantage of these labels.
2. **Sentiment Labels:** Each word in a corpus is labeled in terms of polarity and su labels as well, but we're going to ignore them for now). A corpus' sentiment is th

- **Polarity**: How positive or negative a word is. -1 is very negative. +1 is very
- **Subjectivity**: How subjective, or opinionated a word is. 0 is fact. +1 is very

In [18]:
```
from textblob import TextBlob as TB
```

In [28]:
```
def senti(mystr):
    return TB(mystr).sentiment
```

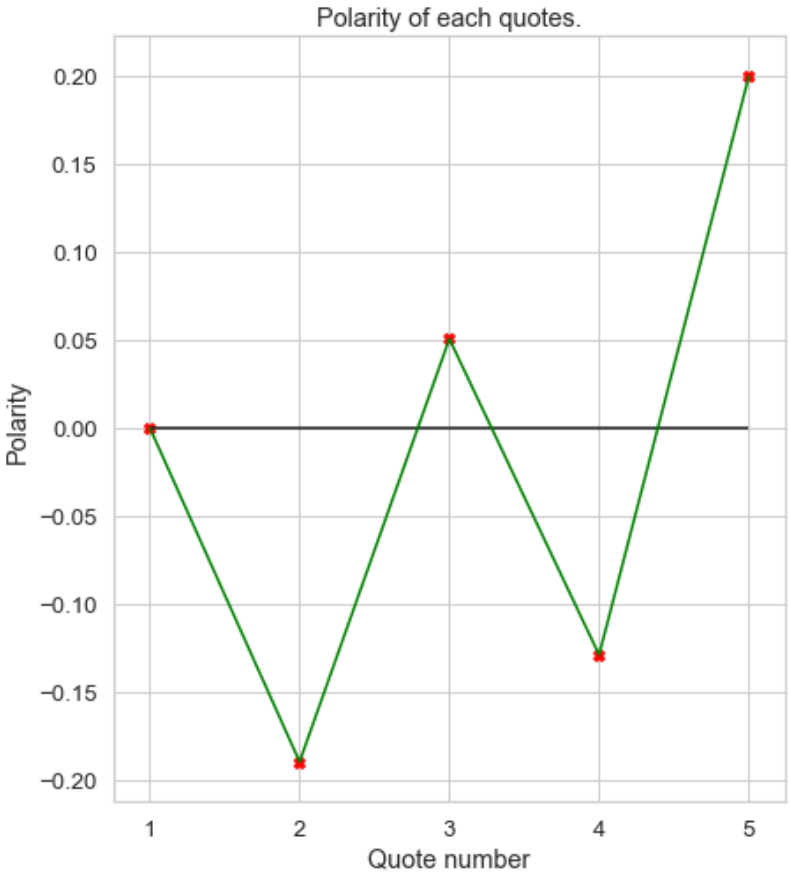
In [26]:
```
for ii in range(len(jokerdf.quote)):
    print(TB(jokerdf.quote[ii]).sentiment, '\n')
```

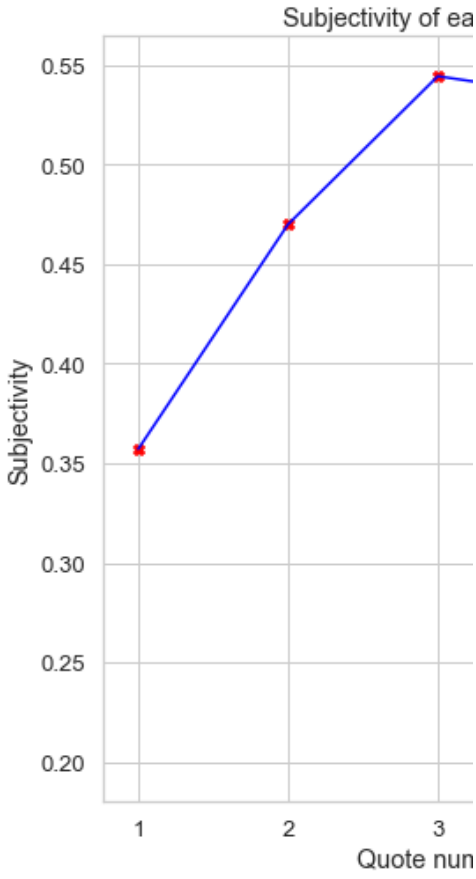
```
Sentiment(polarity=0.0, subjectivity=0.35714285714285715)

Sentiment(polarity=-0.18999999999999995, subjectivity=0.47000000000000003)

Sentiment(polarity=0.05057319223985891, subjectivity=0.544400352733686)

Sentiment(polarity=-0.12916666666666665, subjectivity=0.5333333333333333)

Sentiment(polarity=0.2, subjectivity=0.2)
```

In [34]:
```
pol_list = [TB(jokerdf.quote[ii]).sentiment.polarity for ii in range(len(jokerdf.
sub_list = [TB(jokerdf.quote[ii]).sentiment.subjectivity for ii in range(len(joke
```

In [51]:

```
from matplotlib import pyplot as plt
import seaborn as sns
import numpy as np

plt.figure(figsize = (15,8))
sns.set(style = 'whitegrid', font_scale = 1.2)

plt.subplot(1,2,1)
plt.plot(np.arange(1,len(jokerdf.quote)+1), pol_list, color = 'green')
plt.scatter(np.arange(1,len(jokerdf.quote)+1), pol_list, color = 'red', marker =
plt.hlines(0,1,len(jokerdf.quote))
plt.title('Polarity of each quotes.')
plt.xlabel('Quote number')
plt.ylabel('Polarity')
plt.xticks(np.arange(1,len(jokerdf.quote)+1))

plt.subplot(1,2,2)
plt.plot(np.arange(1,len(jokerdf.quote)+1), sub_list, color = 'blue')
plt.scatter(np.arange(1,len(jokerdf.quote)+1), sub_list, color = 'red', marker =
plt.title('Subjectivity of each quotes.')
plt.xlabel('Quote number')
plt.ylabel('Subjectivity')
plt.xticks(np.arange(1,len(jokerdf.quote)+1))

plt.show()
```


Polarity of each quotes.
Polarity
Quote number
0.20
0.15
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
1
2
3
4
5


Subjectivity of ea
Subjectivity
Quote nun
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
1
2
3

The End.