In [2]:

```
# Install Libraries
!pip install textblob
!pip install tweepy
!pip install boto3 pandas s3fs
!pip install pycountry
!pip install wordcloud
!pip install langdetect
```

```
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Collecting textblob
  Downloading textblob-0.17.1-py2.py3-none-any.whl (636 kB)
     |████████████████████████████████| 636 kB 30.9 MB/s
Requirement already satisfied: nltk>=3.1 in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (from textblob) (3.6.7)
Requirement already satisfied: regex>=2021.8.3 in /home/ec2-user/anaconda3/en
vs/amazonei_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob)
(2022.3.15)
Requirement already satisfied: tqdm in /home/ec2-user/anaconda3/envs/amazonei
_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (4.63.0)
Requirement already satisfied: click in /home/ec2-user/anaconda3/envs/amazone
i_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (7.1.2)
Requirement already satisfied: joblib in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (from nltk>=3.1->textblob) (1.0.1)
Requirement already satisfied: importlib-resources in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tqdm->nltk>=3.1->
textblob) (5.4.0)
Requirement already satisfied: zipp>=3.1.0 in /home/ec2-user/anaconda3/envs/a
mazonei_mxnet_p36/lib/python3.6/site-packages (from importlib-resources->tqdm
->nltk>=3.1->textblob) (3.4.0)
Installing collected packages: textblob
Successfully installed textblob-0.17.1
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Collecting tweepy
  Using cached tweepy-4.6.0-py2.py3-none-any.whl (69 kB)
Requirement already satisfied: requests<3,>=2.27.0 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from tweepy) (2.27.1)
Collecting oauthlib<4,>=3.2.0
  Using cached oauthlib-3.2.0-py3-none-any.whl (151 kB)
Collecting requests-oauthlib<2,>=1.2.0
  Using cached requests_oauthlib-1.3.1-py2.py3-none-any.whl (23 kB)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /home/ec2-user/anacon
da3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.
27.0->tweepy) (1.26.8)
Requirement already satisfied: certifi>=2017.4.17 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.2
7.0->tweepy) (2021.5.30)
Requirement already satisfied: charset-normalizer~=2.0.0 in /home/ec2-user/an
aconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,
>=2.27.0->tweepy) (2.0.12)
Requirement already satisfied: idna<4,>=2.5 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from requests<3,>=2.27.0->twe
epy) (3.1)
Installing collected packages: oauthlib, requests-oauthlib, tweepy
Successfully installed oauthlib-3.2.0 requests-oauthlib-1.3.1 tweepy-4.6.0
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Requirement already satisfied: boto3 in /home/ec2-user/anaconda3/envs/amazone
i_mxnet_p36/lib/python3.6/site-packages (1.23.10)
Requirement already satisfied: pandas in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (1.1.5)
Requirement already satisfied: s3fs in /home/ec2-user/anaconda3/envs/amazonei
```

```
_mxnet_p36/lib/python3.6/site-packages (0.5.2)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /home/ec2-user/anaco
nda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (0.10.
0)
Requirement already satisfied: botocore<1.27.0,>=1.26.10 in /home/ec2-user/an
aconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (1.2
6.10)
Requirement already satisfied: s3transfer<0.6.0,>=0.5.0 in /home/ec2-user/ana
conda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from boto3) (0.5.
2)
Requirement already satisfied: python-dateutil>=2.7.3 in /home/ec2-user/anaco
nda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (2.8.
1)
Requirement already satisfied: pytz>=2017.2 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (2021.1)
Requirement already satisfied: numpy>=1.15.4 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from pandas) (1.19.5)
Requirement already satisfied: fsspec>=0.8.0 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from s3fs) (0.8.7)
Requirement already satisfied: aiobotocore>=1.0.1 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from s3fs) (2.2.0)
Requirement already satisfied: wrapt>=1.10.10 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from aiobotocore>=1.0.1->s3
fs) (1.12.1)
Requirement already satisfied: aioitertools>=0.5.1 in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from aiobotocore>=1.0.
1->s3fs) (0.7.1)
Requirement already satisfied: aiohttp>=3.3.1 in /home/ec2-user/anaconda3/env
s/amazonei_mxnet_p36/lib/python3.6/site-packages (from aiobotocore>=1.0.1->s3
fs) (3.8.1)
Collecting aiobotocore>=1.0.1
  Downloading aiobotocore-2.3.4-py3-none-any.whl (64 kB)
     |████████████████████████████████| 64 kB 5.2 MB/s
Requirement already satisfied: async-generator in /home/ec2-user/anaconda3/en
vs/amazonei_mxnet_p36/lib/python3.6/site-packages (from aiobotocore>=1.0.1->s
3fs) (1.10)
  Downloading aiobotocore-2.3.3.tar.gz (65 kB)
     |████████████████████████████████| 65 kB 7.7 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.3.2.tar.gz (104 kB)
     |████████████████████████████████| 104 kB 69.1 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.3.1.tar.gz (65 kB)
     |████████████████████████████████| 65 kB 5.7 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.3.0.tar.gz (65 kB)
     |████████████████████████████████| 65 kB 6.8 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.1.2.tar.gz (58 kB)
     |████████████████████████████████| 58 kB 8.5 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.1.1.tar.gz (57 kB)
     |████████████████████████████████| 57 kB 9.5 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.1.0.tar.gz (54 kB)
     |████████████████████████████████| 54 kB 5.3 MB/s
```

```
  Preparing metadata (setup.py) ... done
  Using cached aiobotocore-2.0.1.tar.gz (54 kB)
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-2.0.0.tar.gz (52 kB)
     |████████████████████████████████| 52 kB 3.3 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.4.2.tar.gz (52 kB)
     |████████████████████████████████| 52 kB 2.2 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.4.1.tar.gz (52 kB)
     |████████████████████████████████| 52 kB 1.5 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.4.0.tar.gz (51 kB)
     |████████████████████████████████| 51 kB 742 kB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.3.3.tar.gz (50 kB)
     |████████████████████████████████| 50 kB 10.8 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.3.2.tar.gz (49 kB)
     |████████████████████████████████| 49 kB 11.0 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.3.1.tar.gz (48 kB)
     |████████████████████████████████| 48 kB 914 kB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.3.0.tar.gz (48 kB)
     |████████████████████████████████| 48 kB 8.4 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.2.2.tar.gz (48 kB)
     |████████████████████████████████| 48 kB 5.4 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.2.1.tar.gz (48 kB)
     |████████████████████████████████| 48 kB 9.2 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.2.0.tar.gz (47 kB)
     |████████████████████████████████| 47 kB 9.2 MB/s
  Preparing metadata (setup.py) ... done
  Downloading aiobotocore-1.1.2-py3-none-any.whl (45 kB)
     |████████████████████████████████| 45 kB 4.9 MB/s
  Downloading aiobotocore-1.1.1-py3-none-any.whl (45 kB)
     |████████████████████████████████| 45 kB 5.9 MB/s
  Downloading aiobotocore-1.1.0-py3-none-any.whl (43 kB)
     |████████████████████████████████| 43 kB 4.5 MB/s
  Downloading aiobotocore-1.0.7-py3-none-any.whl (42 kB)
     |████████████████████████████████| 42 kB 1.9 MB/s
  Downloading aiobotocore-1.0.6-py3-none-any.whl (42 kB)
     |████████████████████████████████| 42 kB 198 kB/s
  Downloading aiobotocore-1.0.5-py3-none-any.whl (42 kB)
     |████████████████████████████████| 42 kB 1.4 MB/s
  Downloading aiobotocore-1.0.4-py3-none-any.whl (41 kB)
     |████████████████████████████████| 41 kB 905 kB/s
  Downloading aiobotocore-1.0.3-py3-none-any.whl (40 kB)
     |████████████████████████████████| 40 kB 10.4 MB/s
  Downloading aiobotocore-1.0.2-py3-none-any.whl (40 kB)
     |████████████████████████████████| 40 kB 10.7 MB/s
  Downloading aiobotocore-1.0.1-py3-none-any.whl (40 kB)
     |████████████████████████████████| 40 kB 10.6 MB/s
```

```
INFO: pip is looking at multiple versions of s3fs to determine which version
is compatible with other requirements. This could take a while.
Collecting s3fs
  Downloading s3fs-2022.1.0-py3-none-any.whl (25 kB)
Requirement already satisfied: urllib3<1.27,>=1.25.4 in /home/ec2-user/anacon
da3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from botocore<1.27.
0,>=1.26.10->boto3) (1.26.8)
Collecting fsspec==2022.01.0
  Downloading fsspec-2022.1.0-py3-none-any.whl (133 kB)
     |████████████████████████████████| 133 kB 56.3 MB/s
INFO: pip is looking at multiple versions of fsspec to determine which versio
n is compatible with other requirements. This could take a while.
INFO: pip is looking at multiple versions of <Python from Requires-Python> to
determine which version is compatible with other requirements. This could tak
e a while.
Collecting s3fs
  Downloading s3fs-2021.11.1-py3-none-any.whl (25 kB)
Collecting fsspec==2021.11.1
  Using cached fsspec-2021.11.1-py3-none-any.whl (132 kB)
Collecting s3fs
  Downloading s3fs-2021.11.0-py3-none-any.whl (25 kB)
Collecting fsspec==2021.11.0
  Downloading fsspec-2021.11.0-py3-none-any.whl (132 kB)
     |████████████████████████████████| 132 kB 53.4 MB/s
Collecting s3fs
  Downloading s3fs-2021.10.1-py3-none-any.whl (26 kB)
Collecting fsspec==2021.10.1
  Downloading fsspec-2021.10.1-py3-none-any.whl (125 kB)
     |████████████████████████████████| 125 kB 25.5 MB/s
Collecting s3fs
  Downloading s3fs-2021.10.0-py3-none-any.whl (26 kB)
Collecting fsspec==2021.10.0
  Downloading fsspec-2021.10.0-py3-none-any.whl (125 kB)
     |████████████████████████████████| 125 kB 61.0 MB/s
Collecting s3fs
  Downloading s3fs-2021.9.0-py3-none-any.whl (26 kB)
Collecting fsspec==2021.09.0
  Downloading fsspec-2021.9.0-py3-none-any.whl (123 kB)
     |████████████████████████████████| 123 kB 64.9 MB/s
Collecting s3fs
  Downloading s3fs-2021.8.1-py3-none-any.whl (26 kB)
Collecting fsspec==2021.08.1
  Downloading fsspec-2021.8.1-py3-none-any.whl (119 kB)
     |████████████████████████████████| 119 kB 76.1 MB/s
INFO: pip is looking at multiple versions of s3fs to determine which version
is compatible with other requirements. This could take a while.
Collecting s3fs
  Downloading s3fs-2021.8.0-py3-none-any.whl (26 kB)
Collecting fsspec==2021.07.0
  Downloading fsspec-2021.7.0-py3-none-any.whl (118 kB)
     |████████████████████████████████| 118 kB 68.3 MB/s
INFO: pip is looking at multiple versions of fsspec to determine which versio
n is compatible with other requirements. This could take a while.
INFO: pip is looking at multiple versions of <Python from Requires-Python> to
determine which version is compatible with other requirements. This could tak
e a while.
```

```
Collecting s3fs
  Downloading s3fs-2021.7.0-py3-none-any.whl (25 kB)
  Downloading s3fs-2021.6.1-py3-none-any.whl (25 kB)
Collecting fsspec==2021.06.1
  Downloading fsspec-2021.6.1-py3-none-any.whl (115 kB)
     |████████████████████████████████| 115 kB 85.6 MB/s
Collecting s3fs
  Downloading s3fs-2021.6.0-py3-none-any.whl (24 kB)
Collecting fsspec==2021.06.0
  Downloading fsspec-2021.6.0-py3-none-any.whl (114 kB)
     |████████████████████████████████| 114 kB 87.8 MB/s
Collecting s3fs
  Downloading s3fs-2021.5.0-py3-none-any.whl (24 kB)
Collecting fsspec==2021.05.0
  Downloading fsspec-2021.5.0-py3-none-any.whl (111 kB)
     |████████████████████████████████| 111 kB 87.6 MB/s
INFO: This is taking longer than usual. You might need to provide the depende
ncy resolver with stricter constraints to reduce runtime. See https://pip.pyp
a.io/warnings/backtracking for guidance. If you want to abort this run, press
Ctrl + C.
Collecting s3fs
  Downloading s3fs-2021.4.0-py3-none-any.whl (23 kB)
Collecting fsspec==2021.04.0
  Downloading fsspec-2021.4.0-py3-none-any.whl (108 kB)
     |████████████████████████████████| 108 kB 87.9 MB/s
INFO: This is taking longer than usual. You might need to provide the depende
ncy resolver with stricter constraints to reduce runtime. See https://pip.pyp
a.io/warnings/backtracking for guidance. If you want to abort this run, press
Ctrl + C.
INFO: This is taking longer than usual. You might need to provide the depende
ncy resolver with stricter constraints to reduce runtime. See https://pip.pyp
a.io/warnings/backtracking for guidance. If you want to abort this run, press
Ctrl + C.
Collecting s3fs
  Downloading s3fs-0.5.1-py3-none-any.whl (21 kB)
  Downloading s3fs-0.5.0-py3-none-any.whl (21 kB)
  Downloading s3fs-0.4.2-py3-none-any.whl (19 kB)
Requirement already satisfied: importlib-metadata in /home/ec2-user/anaconda
3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from fsspec>=0.8.0->s3
fs) (3.6.0)
Requirement already satisfied: six>=1.5 in /home/ec2-user/anaconda3/envs/amaz
onei_mxnet_p36/lib/python3.6/site-packages (from python-dateutil>=2.7.3->pand
as) (1.15.0)
Requirement already satisfied: zipp>=0.5 in /home/ec2-user/anaconda3/envs/ama
zonei_mxnet_p36/lib/python3.6/site-packages (from importlib-metadata->fsspec>
=0.8.0->s3fs) (3.4.0)
Requirement already satisfied: typing-extensions>=3.6.4 in /home/ec2-user/ana
conda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from importlib-me
tadata->fsspec>=0.8.0->s3fs) (4.1.1)
Installing collected packages: s3fs
  Attempting uninstall: s3fs
    Found existing installation: s3fs 0.5.2
    Uninstalling s3fs-0.5.2:
      Successfully uninstalled s3fs-0.5.2
Successfully installed s3fs-0.4.2
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
```

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ws.com
Collecting pycountry
  Downloading pycountry-22.3.5.tar.gz (10.1 MB)
     |████████████████████████████████| 10.1 MB 25.4 MB/s
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Requirement already satisfied: setuptools in /home/ec2-user/anaconda3/envs/am
azonei_mxnet_p36/lib/python3.6/site-packages (from pycountry) (49.6.0.post202
10108)
Building wheels for collected packages: pycountry
  Building wheel for pycountry (pyproject.toml) ... done
  Created wheel for pycountry: filename=pycountry-22.3.5-py2.py3-none-any.whl
size=10681845 sha256=c7679de20f456eda8d4fe207759e48535e459f16707cca5bb34f5e0a
a64cfa5c
  Stored in directory: /home/ec2-user/.cache/pip/wheels/81/2e/84/0aff7999dc68
fdfeee5c31db245dc3e43cec9d957d1063375e
Successfully built pycountry
Installing collected packages: pycountry
Successfully installed pycountry-22.3.5
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Collecting wordcloud
  Downloading wordcloud-1.8.2.2-cp36-cp36m-manylinux_2_17_x86_64.manylinux201
4_x86_64.whl (435 kB)
     |████████████████████████████████| 435 kB 31.3 MB/s
Requirement already satisfied: numpy>=1.6.1 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (1.19.5)
Requirement already satisfied: matplotlib in /home/ec2-user/anaconda3/envs/am
azonei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (3.3.4)
Requirement already satisfied: pillow in /home/ec2-user/anaconda3/envs/amazon
ei_mxnet_p36/lib/python3.6/site-packages (from wordcloud) (8.4.0)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in /h
ome/ec2-user/anaconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (f
rom matplotlib->wordcloud) (2.4.7)
Requirement already satisfied: cycler>=0.10 in /home/ec2-user/anaconda3/envs/
amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->wordcloud)
(0.10.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /home/ec2-user/anaconda3/
envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->wordclo
ud) (1.3.1)
Requirement already satisfied: python-dateutil>=2.1 in /home/ec2-user/anacond
a3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages (from matplotlib->word
cloud) (2.8.1)
Requirement already satisfied: six in /home/ec2-user/anaconda3/envs/amazonei_
mxnet_p36/lib/python3.6/site-packages (from cycler>=0.10->matplotlib->wordclo
ud) (1.15.0)
Installing collected packages: wordcloud
Successfully installed wordcloud-1.8.2.2
Looking in indexes: https://pypi.org/simple, https://pip.repos.neuron.amazona
ws.com
Collecting langdetect
  Downloading langdetect-1.0.9.tar.gz (981 kB)
     |████████████████████████████████| 981 kB 27.3 MB/s
  Preparing metadata (setup.py) ... done
Requirement already satisfied: six in /home/ec2-user/anaconda3/envs/amazonei_
```

```
mxnet_p36/lib/python3.6/site-packages (from langdetect) (1.15.0)
Building wheels for collected packages: langdetect
  Building wheel for langdetect (setup.py) ... done
  Created wheel for langdetect: filename=langdetect-1.0.9-py3-none-any.whl si
ze=993221 sha256=54942bdd992ac6e5f6f53ea275bee485d707e654d20806ef361550a746bf
6699
  Stored in directory: /home/ec2-user/.cache/pip/wheels/22/e8/62/ef79403841ba
b16f1c4260b967bee7fa579d78552a66c7f6e0
Successfully built langdetect
Installing collected packages: langdetect
Successfully installed langdetect-1.0.9
```

In [ ]:

```
# Import Libraries
from textblob import TextBlob
import sys
import tweepy
import matplotlib.pyplot as plt
import pandas as pd
import nltk
nltk.download('punkt')
nltk.download('vader_lexicon')
nltk.download('stopwords')
import numpy as np
import os
import boto3
from botocore.exceptions import ClientError
import io
import nltk
from pycountry import pycountry
import re
import string
from wordcloud import WordCloud, STOPWORDS
from PIL import Image
from nltk.sentiment.vader import SentimentIntensityAnalyzer
from langdetect import detect
from nltk.stem import SnowballStemmer
from nltk.sentiment.vader import SentimentIntensityAnalyzer
from sklearn.feature_extraction.text import CountVectorizer
from pprint import pprint
import pathlib
```

In [ ]:

```
# Authentication
consumerKey = 'JU51ZoYXcmCEO2LzED2Psbxff'
consumerSecret = 'LaDmdsayeUXqVApSZQ7pS0HpNIvb9Dw094TVfUOw4W1Hdm96Lf'
accessToken = '1539405911948664834-OYIwhePAWVQgodke1msgnDLRRGVTO8'
accessTokenSecret = '88OwNLhOUwwzh5voMrHrEeXLpcTfrr4cTCmDLTshiqCnx'
auth = tweepy.OAuthHandler(consumerKey, consumerSecret)
auth.set_access_token(accessToken, accessTokenSecret)
api = tweepy.API(auth)
```

In [ ]:

```
#Sentiment Analysis
def percentage(part,whole):
 return 100 * float(part)/float(whole)
keyword = input("Please enter keyword or hashtag to search: ")
noOfTweet = int(input ("Please enter how many tweets to analyze: "))
tweets = tweepy.Cursor(api.search_tweets, q=keyword).items(noOfTweet)
positive = 0
negative = 0
neutral = 0
polarity = 0
tweet_list = []
neutral_list = []
negative_list = []
positive_list = []
for tweet in tweets:

 #print(tweet.text)
 tweet_list.append(tweet.text)
 analysis = TextBlob(tweet.text)
 score = SentimentIntensityAnalyzer().polarity_scores(tweet.text)
 neg = score['neg']
 neu = score['neu']
 pos = score['pos']
 comp = score['compound']
 polarity += analysis.sentiment.polarity

 if neg > pos:
     negative_list.append(tweet.text)
     negative += 1
 elif pos > neg:
     positive_list.append(tweet.text)
     positive += 1

 elif pos == neg:
     neutral_list.append(tweet.text)
     neutral += 1

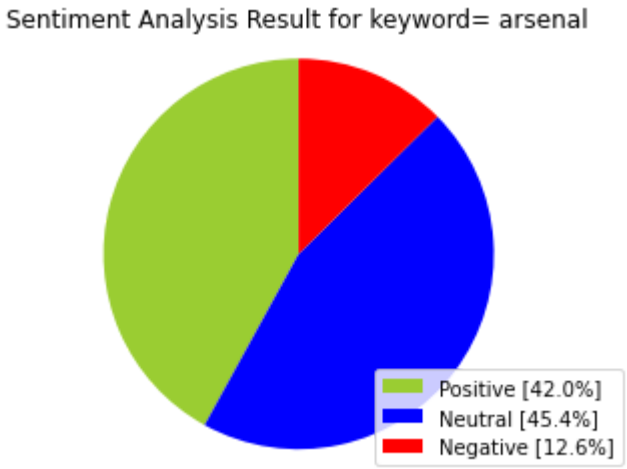
positive = percentage(positive, noOfTweet)
negative = percentage(negative, noOfTweet)
neutral = percentage(neutral, noOfTweet)
polarity = percentage(polarity, noOfTweet)
positive = format(positive, '.1f')
negative = format(negative, '.1f')
neutral = format(neutral, '.1f')
```

In [ ]:

```
#Number of Tweets (Total, Positive, Negative, Neutral)
tweet_list = pd.DataFrame(tweet_list)
neutral_list = pd.DataFrame(neutral_list)
negative_list = pd.DataFrame(negative_list)
positive_list = pd.DataFrame(positive_list)
print("total number: ",len(tweet_list))
print("positive number: ",len(positive_list))
print("negative number: ", len(negative_list))
print("neutral number: ",len(neutral_list))
```

In [6]:

```
#Creating PieCart
labels = ['Positive ['+str(positive)+'%]' , 'Neutral ['+str(neutral)+'%]','Negative ['+str
(negative)+'%]']
sizes = [positive, neutral, negative]
colors = ['yellowgreen', 'blue','red']
patches, texts = plt.pie(sizes,colors=colors, startangle=90)
plt.style.use('default')
plt.legend(labels)
plt.title("Sentiment Analysis Result for keyword= "+keyword+"" )
plt.axis('equal')
plt.show()
```



In [7]:

```
keyword = pd.DataFrame(
    data={"KeyWords": [keyword]},
    columns=["KeyWords"],
)

#keyword.to_csv("/home/ec2-user/twitter-analytics/keyword.csv")
```

In [8]:

```
AWS_S3_BUCKET = "twitter-analytics-21"
AWS_ACCESS_KEY_ID = "AKIAV5ZMW3EHFLISS2XN"
AWS_SECRET_ACCESS_KEY = "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"
AWS_REGION_NAME = "us-east-1"

s3_client = boto3.client(
    "s3",
    region_name=AWS_REGION_NAME,
    aws_access_key_id= AWS_ACCESS_KEY_ID,
    aws_secret_access_key=AWS_SECRET_ACCESS_KEY,
)
```

```
/home/ec2-user/anaconda3/envs/amazonei_mxnet_p36/lib/python3.6/site-packages/
boto3/compat.py:88: PythonDeprecationWarning: Boto3 will no longer support Py
thon 3.6 starting May 30, 2022. To continue receiving service updates, bug fi
xes, and security updates please upgrade to Python 3.7 or later. More informa
tion can be found here: https://aws.amazon.com/blogs/developer/python-support
-policy-updates-for-aws-sdks-and-tools/
  warnings.warn(warning, PythonDeprecationWarning)
```

In [9]:

```
#Upload Tweet FIle to S3, converting it form data frame to a csv file
with io.StringIO() as csv_buffer:
    tweet_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/tweet_list.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [10]:

```
 # Upload File for the neutral list created
with io.StringIO() as csv_buffer:
    neutral_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/neutral_list.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [11]:

```
# Upload File for negative tweets
with io.StringIO() as csv_buffer:
    negative_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/negative_list.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")

    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [12]:

```
# Upload Files for positive tweets
with io.StringIO() as csv_buffer:
    positive_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/positive_list.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [13]:

```
# Upload the Keywords file
with io.StringIO() as csv_buffer:
    keyword.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/keyword.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [14]:

```
# Cleaning Tweets to Analyze Tweets, dropping duplicates using drop_duplicates function

tweet_list.drop_duplicates(inplace = True)
```

In [15]:

```
#Cleaning Text (RT, Punctuation etc)
# Referenced code from https://dylancastillo.co/nlp-snippets-clean-and-tokenize-text-with-python/ and class lessons

tw_list = pd.DataFrame(tweet_list)
tw_list["text"] = tw_list[0]

#Removing RT, Punctuation etc

remove_rt = lambda x: re.sub('RT @\w+: '," ",x)
 # print(remove_rt)
rt = lambda x:  re.sub(r"https?://\S+",' ',re.sub(r'[^A-Za-z0-9\s]+',' ',x))
tw_list["text"] = tw_list.text.map(remove_rt).map(rt)
tw_list["text"] = tw_list.text.str.lower()
# tw_list.tail(10)
```

In [18]:

```
#Using the clean data to calculate the polarity, sbjecivity, sentiment, -/+

tw_list[['polarity', 'subjectivity']] = tw_list['text'].apply(lambda Text: pd.Series(TextB
lob(Text).sentiment))
for index, row in tw_list['text'].iteritems():
 score = SentimentIntensityAnalyzer().polarity_scores(row)
 neg = score['neg']
 neu = score['neu']
 pos = score['pos']
 comp = score['compound']
 if neg > pos:
     tw_list.loc[index, 'sentiment'] = "negative"
 elif pos > neg:
     tw_list.loc[index, 'sentiment'] = "positive"
 else:
     tw_list.loc[index, 'sentiment'] = "neutral"
     tw_list.loc[index, 'neg'] = neg
     tw_list.loc[index, 'neu'] = neu
     tw_list.loc[index, 'pos'] = pos
     tw_list.loc[index, 'compound'] = comp
tw_list.head(10)
```

Out[18]:

	0	text	polarity	subjectivity	sentiment	neg	neu	pos	comp
0	RT @CaseologyJ: ✨\#Pixel6a 発売記念、ナノポップをプレゼント/✨\...	pixel6a \n\n caseologyj \n rt\n\n up \n \n ...	0.000000	0.000000	neutral	0.0	1.0	0.0	
1	Googleの新スマホ「Pixel 6a」の外観や同梱品、基本機能を写真や動画で紹介！5万円...	google pixel 6a 5 https t co yr8ppjn8qf	0.000000	0.000000	neutral	0.0	1.0	0.0	
2	I just got back from a road trip. The Google P...	i just got back from a road trip the google p...	0.200000	0.250000	neutral	0.0	1.0	0.0	
3	@guo6ovjs9Ltc3dK 沢山ありますよ〜昨日もpixel 6a一括1円でしたよ！	guo6ovjs9ltc3dk pixel 6a 1	0.000000	0.000000	neutral	0.0	1.0	0.0	
4	Googleの新スマホ「#Pixel 6a」の外観や同梱品、基本機能を写真や動画で紹介！5万...	google pixel 6a 5 \n it https t co q8rcc7ugra	0.000000	0.000000	neutral	0.0	1.0	0.0	
5	RT @ASB_YT: 🔥🔥 GIVEAWAY!!🔥🔥\n\nI have teamed u...	giveaway \n\ni have teamed up with googleu...	0.136364	0.454545	positive	NaN	NaN	NaN	
6	今売れてるスマートフォンTOP10、「Pixel 6a」と「AQUOS wish2」が初TO...	top10 pixel 6a aquos wish2 top10 2022 8 7 ...	0.000000	0.000000	neutral	0.0	1.0	0.0	
8	Do you ever wonder what's up there?\n\n📷 Pixel...	do you ever wonder what s up there \n\n pixel...	0.000000	0.000000	neutral	0.0	1.0	0.0	
9	The Google Pixel 6a Giveaway is today!!!!! I w...	the google pixel 6a giveaway is today i will ...	0.000000	0.300000	neutral	0.0	1.0	0.0	
12	@TheTechAdvizer @Kakashi_Ax @TheGalox_ Once yo...	thetechadvizer kakashi ax thegalox once yo...	-0.250000	0.683333	neutral	0.0	1.0	0.0	

In [19]:

```
# Breaking data frame into 3

tw_list_negative = tw_list[tw_list["sentiment"]=="negative"]
tw_list_positive = tw_list[tw_list["sentiment"]=="positive"]
tw_list_neutral = tw_list[tw_list["sentiment"]=="neutral"]
```

In [20]:

```
# COunt for sentiments features
def count_values_in_column(data,feature):
 total=data.loc[:,feature].value_counts(dropna=False)
 percentage=round(data.loc[:,feature].value_counts(dropna=False,normalize=True)*100,2)
 return pd.concat([total,percentage],axis=1,keys=['Total','Percentage'])
#Count_values for sentiment
count_values_in_column(tw_list,"sentiment")
```

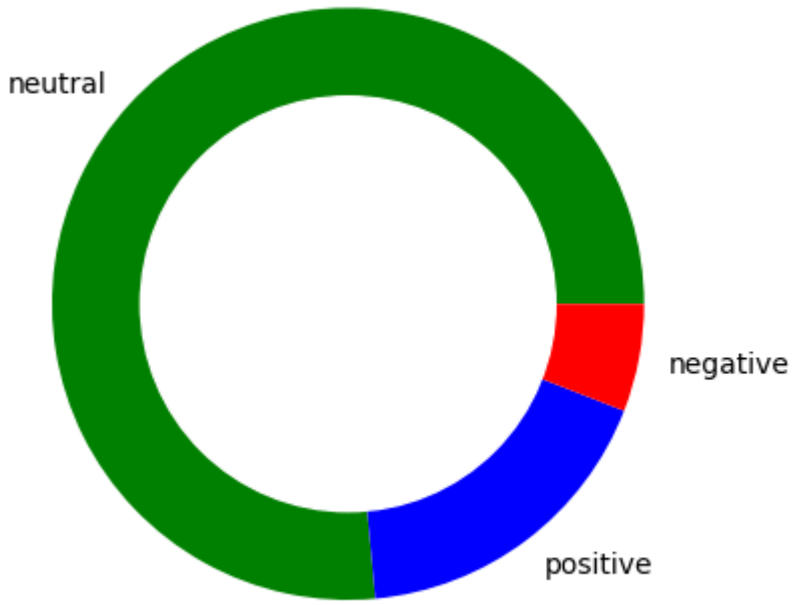
Out[20]:

	Total	Percentage
neutral	26	76.47
positive	6	17.65
negative	2	5.88

In [21]:

```
# create data for Pie Chart
pichart = count_values_in_column(tw_list,"sentiment")
names= pichart.index
size= pichart["Percentage"]

# Create a circle for the center of the plot
my_circle=plt.Circle( (0,0), 0.7, color='white')
plt.pie(size, labels=names, colors=['green','blue','red'])
p=plt.gcf()
p.gca().add_artist(my_circle)
plt.show()
```



In [22]:

```
# Upload Files
with io.StringIO() as csv_buffer:
    tw_list.to_csv(csv_buffer, index=False)

    response = s3_client.put_object(
        Bucket=AWS_S3_BUCKET, Key="files/tw_list.csv", Body=csv_buffer.getvalue()
    )

    status = response.get("ResponseMetadata", {}).get("HTTPStatusCode")
    if status == 200:
        print(f"Successful S3 put_object response. Status - {status}")
    else:
        print(f"Unsuccessful S3 put_object response. Status - {status}")
```

```
Successful S3 put_object response. Status - 200
```

In [23]:

```
#Creating new data frames for all sentiments (positive, negative and neutral)

tw_list_negative = tw_list[tw_list["sentiment"]=="negative"]
tw_list_positive = tw_list[tw_list["sentiment"]=="positive"]
tw_list_neutral = tw_list[tw_list["sentiment"]=="neutral"]
```

In [24]:

```
def count_values_in_column(data,feature):
 total=data.loc[:,feature].value_counts(dropna=False)
 percentage=round(data.loc[:,feature].value_counts(dropna=False,normalize=True)*100,2)
 return pd.concat([total,percentage],axis=1,keys=['Total','Percentage'])
#Count_values for sentiment
count_values_in_column(tw_list,"sentiment")
```

Out[24]:

	Total	Percentage
neutral	26	76.47
positive	6	17.65
negative	2	5.88

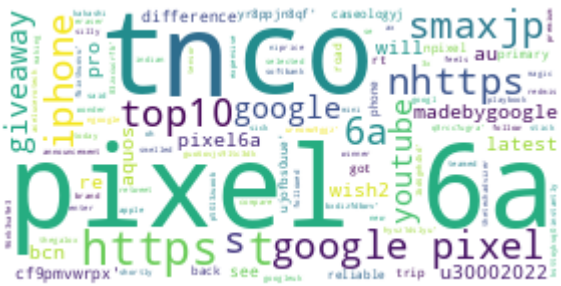
In [25]:

```
#Function to Create Wordcloud from Kaggle and https://www.analyticsvidhya.com/blog/2021/08/creating-customized-word-cloud-in-python/
def create_wordcloud(text):
 mask = np.array(Image.open("cloud.png"))
 stopwords = set(STOPWORDS)
 wc = WordCloud(background_color="white",
 mask = mask,
 max_words=3000,
 stopwords=stopwords,
 repeat=True)
 wc.generate(str(text))
 wc.to_file("wc.png")
 print("Word Cloud Saved Successfully")
 path="wc.png"
 display(Image.open(path))
```

In [26]:

```
#Creating wordcloud for all tweets
create_wordcloud(tw_list["text"].values)
```

Word Cloud Saved Successfully



In [27]:

```
# for posticve tweets
create_wordcloud(tw_list_positive["text"].values)
```

Word Cloud Saved Successfully

In [28]:

```
# for negative
create_wordcloud(tw_list_negative["text"].values)
```

```
Word Cloud Saved Successfully
```

In [30]:

```
#Removing Punctuation
def remove_punct(text):
 text = "".join([char for char in text if char not in string.punctuation])
 text = re.sub('[0-9]+', '', text)
 return text
tw_list['punct'] = tw_list['text'].apply(lambda x: remove_punct(x))
#Appliyng tokenization
def tokenization(text):
    text = re.split('\W+', text)
    return text
tw_list['tokenized'] = tw_list['punct'].apply(lambda x: tokenization(x.lower()))
#Removing stopwords
stopword = nltk.corpus.stopwords.words('english')
def remove_stopwords(text):
    text = [word for word in text if word not in stopword]
    return text

tw_list['nonstop'] = tw_list['tokenized'].apply(lambda x: remove_stopwords(x))
#Appliyng Stemmer
ps = nltk.PorterStemmer()
def stemming(text):
    text = [ps.stem(word) for word in text]
    return text
tw_list['stemmed'] = tw_list['nonstop'].apply(lambda x: stemming(x))
#Cleaning Text
def clean_text(text):
    text_lc = "".join([word.lower() for word in text if word not in string.punctuation]) #
remove puntuation
    text_rc = re.sub('[0-9]+', '', text_lc)
    tokens = re.split('\W+', text_rc)    # tokenization
    text = [ps.stem(word) for word in tokens if word not in stopword]  # remove stopwords
 and stemming
    return text
tw_list.head()
```

Out[30]:

	0	text	polarity	subjectivity	sentiment	neg	neu	pos	compound
0	RT @CaseologyJ: ✨\#Pixel6a 発売記念、ナノポップをプレゼント/✨\...	pixel6a \n\n caseologyj \n rt\n\n up \n \n ...	0.0	0.00	neutral	0.0	1.0	0.0	0.(
1	Googleの新スマホ「Pixel 6a」の外観や同梱品、基本機能を写真や動画で紹介！5万円...	google pixel 6a 5 https t co yr8ppjn8qf	0.0	0.00	neutral	0.0	1.0	0.0	0.(
2	I just got back from a road trip. The Google P...	i just got back from a road trip the google p...	0.2	0.25	neutral	0.0	1.0	0.0	0.(
3	@guo6ovjs9Ltc3dK 沢山ありますよ〜昨日もpixel 6a一括1円でしたよ！	guo6ovjs9ltc3dk pixel 6a 1	0.0	0.00	neutral	0.0	1.0	0.0	0.(
4	Googleの新スマホ「#Pixel 6a」の外観や同梱品、基本機能を写真や動画で紹介！5万...	google pixel 6a 5 \n it https t co q8rcc7ugra	0.0	0.00	neutral	0.0	1.0	0.0	0.(

In [31]:

```
#Appliyng Countvectorizer
countVectorizer = CountVectorizer(analyzer=clean_text)
countVector = countVectorizer.fit_transform(tw_list['text'])
print('{} Number of reviews has {} words'.format(countVector.shape[0], countVector.shape[1
]))
#print(countVectorizer.get_feature_names())

count_vect_df = pd.DataFrame(countVector.toarray(), columns=countVectorizer.get_feature_na
mes())
count_vect_df.head()
```

```
34 Number of reviews has 154 words
```

Out[31]:

		acelucerotech	aernmuqn	ahamo	amazon	announc	aosp	appl	aquo	au	...	wish	wo
0	2	0	0	0	0	0	0	0	0	0	...	0	
1	0	0	0	0	0	0	0	0	0	0	...	0	
2	0	0	0	0	0	0	0	0	0	0	...	0	
3	2	0	0	0	0	0	0	0	0	0	...	0	
4	0	0	0	0	0	0	0	0	0	0	...	0	

5 rows × 154 columns

In [32]:

```
# Most Used Words
count = pd.DataFrame(count_vect_df.sum())
countdf = count.sort_values(0,ascending=False).head(20)
countdf[1:11]
```

Out[32]:

	0
	31
http	30
co	29
googl	19
smaxjp	4
iphon	4
top	4
pro	3
madebygoogl	3
giveaway	3

In [ ]:

```

```