Q2 Text Mining --> Amazon

1) Extract reviews of any product from ecommerce website like amazon
2) Perform emotion mining

1. Import libs

In [44]:

```
import pandas as pd
import numpy as np
import requests
from bs4 import BeautifulSoup as bs
from selenium import webdriver
from flask import Response
import re
import nltk
from nltk.stem import WordNetLemmatizer
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.tokenize import sent_tokenize
from sklearn.feature_extraction.text import TfidfVectorizer
from wordcloud import WordCloud
import matplotlib.pyplot as plt
```

2. Import Data

Connecting to Amazon.in to download reviews

In [15]:

```
iphone_review=[]
```

In [16]:

```
for i in range(1,100):
    op= []
    url = "https://www.amazon.in/Apple-iPhone-14-128GB-Blue/product-reviews/B0BDK62PDX/ref=
    responce = requests.get(url)
    soup = bs(responce.content,"html.parser")
    reviews = soup.findAll("span",attrs = {"class","a-size-base review-text review-text-con
    for i in range(len(reviews)):
        op.append(reviews[i].text)
    iphone_review = iphone_review+op
```

Downloading review from Amazon.in

In [17]:

```
iphone_review = list(set(iphone_review))
iphone_review
```

Out[17]:

```
['\nValue for Money\n',
 '\nAbout the phoneApple phone without a second delay, I would say it is bet
ter than all android phones I have used. The phone is like water, it flows i
n a way you want and shaping in your way. In a best way possible, the phone
is designed to only show what the user wants and eliminating unnecessary ad
s, features that I have seen in android.Why it is better than Android?You pa
y too much money for Apple products, obviously you experience the features,
physical components , camera lens etc. Apart from basic things, you can also
enjoy the best applications available in app store. If you are a developer y
ou might know the app store policy for application publish and their securit
y posture towards handling payment apps etc. They publish best application a
nd the way the apps, its modules switches is just flawless. Due to the so ca
lled strict policy of privacy program with Apple products, iPhone can pop up
a box in your screen if any apps wants to track your activity with other app
lications. +1 respect for apple to show such concern with user.Apple phones
are same ? like 13 vs 14The reason 14 is same as 13 may be business practice
followed from 11th edition. But please note that iPhone making changes inter
nally like physical components (small change in battery performance, lens in
14 edition), additional features but that may not satisfy you to buy 14 edit
ion. If you do not find "the very few changes" interesting in 14,  go for 1
3. Because physical and even cameras are not visually very much different in
13 vs 14 comparison. Also you get 13 for cheap :)14 is just added features b
ut that is not for daily use, the features real time use is rare case. But t
he best part is there is no extra cost between 13 vs 14 prices (except extra
10k slash)Concern you must have.Apple is not giving chargers and their silic
on cases are very expensive (but very good in touch and scratch friendly in
back due to silk layer). This is an issue for sure. You have to buy charger
not coming with USB C and claiming that you help carbon footprint, understan
dable but not customer friendly business model. Even after the purchase I ha
d to spend at least 7k for charger and case.Apple care.I am not buying it, I
pay for phone which is already expensive for this premium and apple care doe
s have strict policy that if you understand that is waste. Instead I find a
private insurance to make things better.\n',
 '\nI like iphone sound quality but camera is ok ok zoom level is low ……batt
ery life also superb and after one time charge it will continue for 2 days a
nd fast charging…worth to buy it\n',
 '\n\n\n\n\n                    The media could not be loaded.\n
\n\n\n\n\xa0Wanted 2 buy iPhone 14pro or max as the picture displayed like s
imilar when you compare iPhone with pro and max. Hence it is Amazon who shou
ld have given me an options for various colors while loading and to choose f
rom its 14 series..late uploaded though as I bought it as on sep 24th 2022.I
n regards the phone it is just like a cream in your hand , immensely smooth
and the performance is at par. I would rate the rear camera A++ however they
should have offered the charger at least along with cable.\n',
 '\nNice\n',
 '\nMotion camera is good rest all features are of 1 13\n',
 '\nI was going to buy iphone 13 first but was waiting for new colour of blu
e whichwas worth waiting its blue colour is stunning and looks fabulous\n',
 '\nValue for Money @80k The most important thing is that i like the cinemat
ic mode in iphone 14 which is fabulous and batter backup.\n',
 '\nI want to return it ASAP\n',
 '\nProduct feel & experience is good and excellent in use.\n']
```

3. Data Preprocessing

remove both the leading and the trailing characters

In [21]:

```
iphone_review=[Text.strip() for Text in iphone_review]
iphone_review=[Text for Text in iphone_review if Text] # removes empty strings.
iphone_review[0:10]
```

Out[21]:

```
['Value for Money',
 'About the phoneApple phone without a second delay, I would say it is bette
r than all android phones I have used. The phone is like water, it flows in
a way you want and shaping in your way. In a best way possible, the phone is
designed to only show what the user wants and eliminating unnecessary ads, f
eatures that I have seen in android.Why it is better than Android?You pay to
o much money for Apple products, obviously you experience the features, phys
ical components , camera lens etc. Apart from basic things, you can also enj
oy the best applications available in app store. If you are a developer you
might know the app store policy for application publish and their security p
osture towards handling payment apps etc. They publish best application and
the way the apps, its modules switches is just flawless. Due to the so calle
d strict policy of privacy program with Apple products, iPhone can pop up a
box in your screen if any apps wants to track your activity with other appli
cations. +1 respect for apple to show such concern with user.Apple phones ar
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ollowed from 11th edition. But please note that iPhone making changes intern
ally like physical components (small change in battery performance, lens in
14 edition), additional features but that may not satisfy you to buy 14 edit
ion. If you do not find "the very few changes" interesting in 14,  go for 1
3. Because physical and even cameras are not visually very much different in
13 vs 14 comparison. Also you get 13 for cheap :)14 is just added features b
ut that is not for daily use, the features real time use is rare case. But t
he best part is there is no extra cost between 13 vs 14 prices (except extra
10k slash)Concern you must have.Apple is not giving chargers and their silic
on cases are very expensive (but very good in touch and scratch friendly in
back due to silk layer). This is an issue for sure. You have to buy charger
not coming with USB C and claiming that you help carbon footprint, understan
dable but not customer friendly business model. Even after the purchase I ha
d to spend at least 7k for charger and case.Apple care.I am not buying it, I
pay for phone which is already expensive for this premium and apple care doe
s have strict policy that if you understand that is waste. Instead I find a
private insurance to make things better.',
 'I like iphone sound quality but camera is ok ok zoom level is low ……batter
y life also superb and after one time charge it will continue for 2 days and
fast charging…worth to buy it',
 'The media could not be loaded.\n                \n\n\n\xa0Wanted 2 buy i
Phone 14pro or max as the picture displayed like similar when you compare iP
hone with pro and max. Hence it is Amazon who should have given me an option
s for various colors while loading and to choose from its 14 series..late up
loaded though as I bought it as on sep 24th 2022.In regards the phone it is
just like a cream in your hand , immensely smooth and the performance is at
par. I would rate the rear camera A++ however they should have offered the c
harger at least along with cable.',
 'Nice',
 'Motion camera is good rest all features are of 1 13',
 'I was going to buy iphone 13 first but was waiting for new colour of blue
whichwas worth waiting its blue colour is stunning and looks fabulous',
 'Value for Money @80k The most important thing is that i like the cinematic
mode in iphone 14 which is fabulous and batter backup.',
 'I want to return it ASAP',
 'Product feel & experience is good and excellent in use.']
```

Joining the list into one string/text

In [22]:

```
txt_upd = ' '.join(iphone_review)
txt_upd
```

```
ore. If you are a developer you might know the app store policy for applic
ation publish and their security posture towards handling payment apps et
c. They publish best application and the way the apps, its modules switche
s is just flawless. Due to the so called strict policy of privacy program
with Apple products, iPhone can pop up a box in your screen if any apps wa
nts to track your activity with other applications. +1 respect for apple t
o show such concern with user.Apple phones are same ? like 13 vs 14The rea
son 14 is same as 13 may be business practice followed from 11th edition.
But please note that iPhone making changes internally like physical compon
ents (small change in battery performance, lens in 14 edition), additional
features but that may not satisfy you to buy 14 edition. If you do not fin
d "the very few changes" interesting in 14,  go for 13. Because physical a
nd even cameras are not visually very much different in 13 vs 14 compariso
n. Also you get 13 for cheap :)14 is just added features but that is not f
or daily use, the features real time use is rare case. But the best part i
s there is no extra cost between 13 vs 14 prices (except extra 10k slash)C
oncern you must have.Apple is not giving chargers and their silicon cases
are very expensive (but very good in touch and scratch friendly in back du
e to silk layer). This is an issue for sure. You have to buy charger not c
oming with USB C and claiming that you help carbon footprint. understandab
```

In [25]:

```
txt_upd = re.sub("[^A-Za-z" "]+"," ",txt_upd).lower() #remove special character
txt_upd = re.sub("[0-9" "]+"," ",txt_upd).lower() #remove numbers
txt_upd = re.sub(r'^https?:\/\/.*[\r\n]*', '', txt_upd).lower() #remove hyperlink
txt_upd
```

```
ou can also enjoy the best applications available in app store if you are
a developer you might know the app store policy for application publish an
d their security posture towards handling payment apps etc they publish be
st application and the way the apps its modules switches is just flawless
due to the so called strict policy of privacy program with apple products
iphone can pop up a box in your screen if any apps wants to track your act
ivity with other applications respect for apple to show such concern with
user apple phones are same like vs the reason is same as may be business p
ractice followed from th edition but please note that iphone making change
s internally like physical components small change in battery performance
lens in edition additional features but that may not satisfy you to buy ed
ition if you do not find the very few changes interesting in go for becaus
e physical and even cameras are not visually very much different in vs com
parison also you get for cheap is just added features but that is not for
daily use the features real time use is rare case but the best part is the
re is no extra cost between vs prices except extra k slash concern you mus
t have apple is not giving chargers and their silicon cases are very expen
sive but very good in touch and scratch friendly in back due to silk layer

this is an issue for sure you have to buy charger not coming with usb c an
```

In [32]:

```
text_tokens = word_tokenize(txt_upd)
```

In [33]:

```
tokens_without_sw = [word for word in text_tokens if not word in stopwords.words()]
```

In [35]:

```
tf = TfidfVectorizer()
```

In [36]:

```
text_tf = tf.fit_transform(tokens_without_sw)
```

Create the DataFrame

In [38]:

```
feature_names = tf.get_feature_names_out ()
dense = text_tf.todense()
denselist = dense.tolist()
df =pd.DataFrame(denselist, columns=feature_names)
```

In [39]:

```
df
```

Out[39]:

	activity	added	additional	ads	amazon	android	app	apple	application	applications	.
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	0.0	0.0	0.0	0.0	0.0	.
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
...	...	...	...	...	...	...	...	...	...	...	.
255	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
256	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
257	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
258	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.
259	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.

260 rows × 181 columns

In [40]:

```
word_list = ' '.join(df)
```

In [48]:

```
wordcloud = WordCloud(background_color='black',width=1800,height=1400).generate(word_list)
```

In [49]:

```
plt.figure(figsize=(10,10))
plt.imshow(wordcloud)
plt.axis('off')
plt.show()
```

4. Sentimental Analysis

In [50]:

```
with open('positive-words.txt') as pw:
    positive_words = pw.read().split("\n")
```

In [51]:

```
positive_words = positive_words[35:]
positive_words
```

```
 'adequate',
 'adjustable',
 'admirable',
 'admirably',
 'admiration',
 'admire',
 'admirer',
 'admiring',
 'admiringly',
 'adorable',
 'adore',
 'adored',
 'adorer',
 'adoring',
 'adoringly',
 'adroit',
 'adroitly',
 'adulate',
 'adulation',
 'adulatory',
```

In [52]:

```
with open('negative-words.txt') as nw:
    negative_words = nw.read().split("\n")
```

In [53]:

```
negative_words = negative_words[35:]
negative_words
```

```
 'abominable',
 'abominably',
 'abominate',
 'abomination',
 'abort',
 'aborted',
 'aborts',
 'abrade',
 'abrasive',
 'abrupt',
 'abruptly',
 'abscond',
 'absence',
 'absent-minded',
 'absentee',
 'absurd',
 'absurdity',
 'absurdly',
 'absurdness',
 'abuse'
```

In [54]:

```
txt_pos_in_pw = ' '.join([word for word in df if word in positive_words])
```

In [55]:

```
wordcloud_pos = WordCloud(background_color='black',width=1800,height=1400).generate(txt_pos
```

In [57]:

```
plt.figure(figsize=(7,15))
plt.imshow(wordcloud_pos)
plt.axis('off')
plt.show()
```

In [59]:

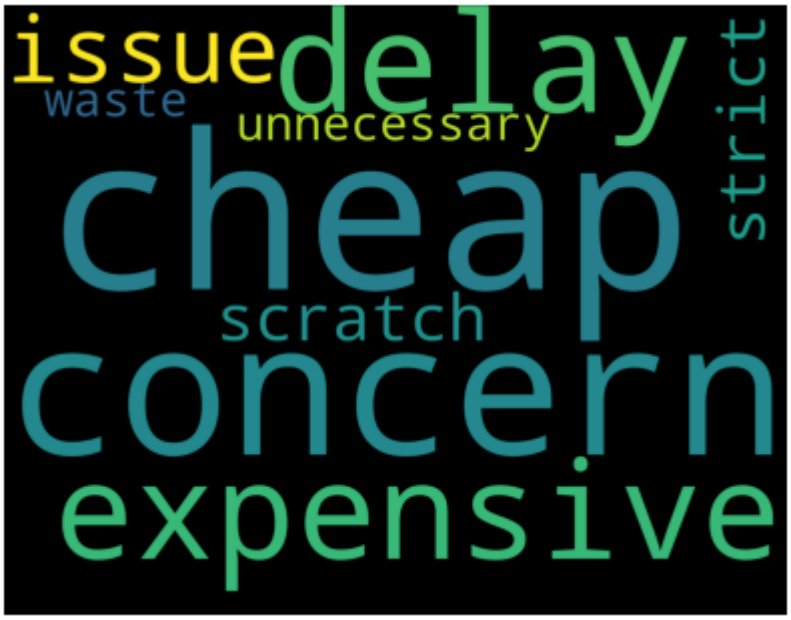
```
txt_neg_in_nw = ' '.join([word for word in df if word in negative_words])
```

In [62]:

```
wordcloud_neg = WordCloud( background_color='black',width=1800,height=1400).generate(txt_ne
```

In [64]:

```
plt.figure(figsize=(7,15))
plt.imshow(wordcloud_neg)
plt.axis('off')
plt.show()
```



END

In [ ]:

```

```