

✓ Import packages

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import nltk
import re
import string

from nltk.sentiment.vader import SentimentIntensityAnalyzer

from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator

nltk.download('stopwords')

from nltk.corpus import stopwords

stopword = set(stopwords.words('english'))

[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data] Unzipping corpora/stopwords.zip.
```

✓ Read/Import Data

```
data = pd.read_csv('/content/drive/MyDrive/machine-learning-data/flipkart_reviews.csv')

print(data.head(10))

print(data.isnull().sum())
```

```

Product_name \
0  Lenovo Ideapad Gaming 3 Ryzen 5 Hexa Core 5600...
1  Lenovo Ideapad Gaming 3 Ryzen 5 Hexa Core 5600...
2  Lenovo Ideapad Gaming 3 Ryzen 5 Hexa Core 5600...
3  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
4  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
5  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
6  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
7  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
8  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...
9  DELL Inspiron Athlon Dual Core 3050U - (4 GB/2...

Review Rating
0  Best under 60k Great performanceI got it for a... 5
1                                     Good perfomence... 5
2  Great performance but usually it has also that... 5
3      My wife is so happy and best product 😊😄 5
4  Light weight laptop with new amazing features,... 5
5  Amazing laptop, am so much happy, thanks for F... 5
6      Over all a good laptop for personal use 5
7          Thank you so much Flipkart 4
8          Amazing product 5
9  Good for normal work , students, online classe... 3
Product_name 0
Review 0
Rating 0
dtype: int64
```

```
stemmer = nltk.SnowballStemmer("english")

def clean(text):
    text=str(text).lower()
    text=re.sub('[. *?]', '', text)
    text=re.sub('https?://\S+|www.\S+', '', text)
    text=re.sub('<.*?>+', '', text)
    text=re.sub('n', '', text)
    text=re.sub('\W*d\W*', '', text)
    #text=re.sub('[%S]' %% re.escape(string.punctuation), '', text)

    text=[word for word in text.split(' ')]
    text="".join(text)
    text=[stemmer.stem(word) for word in text.split(' ')]
```

```

text="".join(text)
return text

data["Review"] = data["Review"].apply(clean)

```

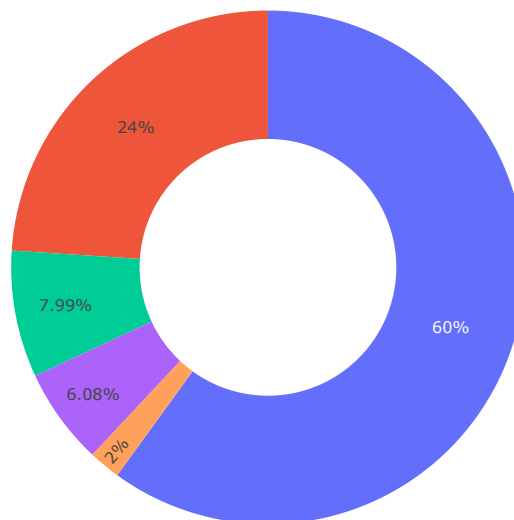
✓ Visualize the Data - Pie Chart

```

ratings = data["Rating"].value_counts()
numbers = ratings.index
quantity = ratings.values

import plotly.express as px
figure = px.pie(data, values=quantity, names=numbers, hole=0.5)
figure.show()

```



✓ Sentiment Intensity Analyzer

```

nltk.download('vader_lexicon')
sentiments= SentimentIntensityAnalyzer()
data['Positive']= [sentiments.polarity_scores(i)["pos"] for i in data["Review"]]
data['Negative']= [sentiments.polarity_scores(i)["neg"] for i in data["Review"]]
data['Neutral']= [sentiments.polarity_scores(i)["neu"] for i in data["Review"]]

data = data[["Review", "Positive", "Negative", "Neutral"]]

print(data.head(10))

[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
[nltk_data] Package vader_lexicon is already up-to-date!

```

	Review	Positive	Negative	Neutral
0	bestuer60kgreatperformaceigotitforarou58500bat...	0.0	0.0	1.0
1	gooperfomece...	0.0	0.0	1.0
2	greatperformacebutusuallyithasalsothatgamiglap...	0.0	0.0	1.0
3	mywifeissohappyabestprouct 😊	0.0	0.0	1.0
4	lightweightlaptopwithewamazigfeatures,battery1...	0.0	0.0	1.0
5	amaziglaptop,amsomuchhappy,thaksforflipkart.	0.0	0.0	1.0
6	overallagoolaptopforpersoalus	0.0	0.0	1.0
7	thakyouso muchflipkart	0.0	0.0	1.0
8	amazigprouct	0.0	0.0	1.0
9	gooforormalwork,stuets,olieclasses,watchigmovi...	0.0	0.0	1.0

✓ Overall Sentiment Score

```
x=sum(data["Positive"])
y=sum(data["Negative"])
z=sum(data["Neutral"])

def sentimentScore(a,b,c):
    if(a >b) and (a > c):
        print("Positive")
    elif (b >1) and (b > c):
        print("Negative")
    else:
        print("Neutral")

sentimentScore(x,y,z)
```

Neutral

Reason

```
print("Positive: ", x)
print("Negative: ", y)
print("Neutral: ", z)

Positive: 32.0
Negative: 0.0
Neutral: 2272.0
```