Sentiment Analysis System

WHAT

1. It is a Natural Language Processing Application(It is a field of AI that enables computers to understand, interpret, and generate human language) which can analyse the sentiment on text data.
2. This Application predict the sentiment into 3 categories Positive, Negative and Neutral.
3. This Application then visualize the result based on different different factor such as age,gender,language,city etc.
4. This Application can get data from google form through a google sheet.
5. This Application is a web application which can be access over a LAN(Local Area Network).

WHY

1. This project has many use cases such as product/service monitoring, survey analysis, social media monitoring ,feedback analysis.
2. This project shows my programming skills ,Machine learning Knowledge ,practical implementation of NLP.
3. This kind of project is very good from resume point of view.

HOW

Backend:

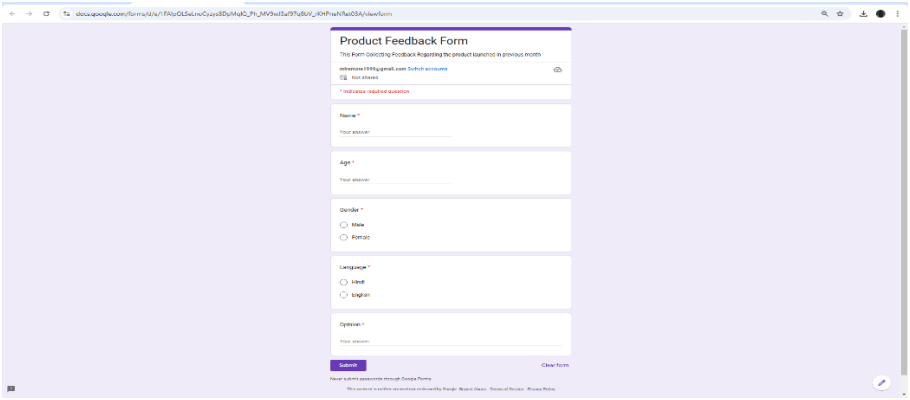
Data Collection	Google Sheets With Python
Data Organization	Pandas
Data Analysis	nltk,vaderSentiment
Data Visualization	plotly

Frontend : Google Form

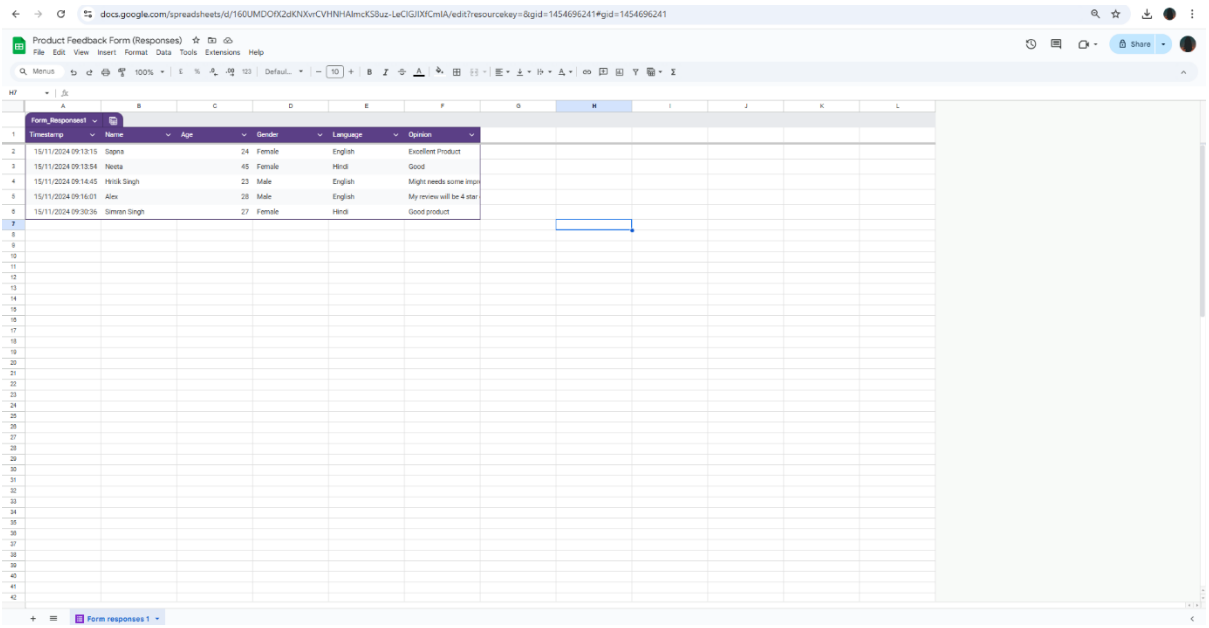
Web Application : Streamlit

Step-1:Creating a Google Form Link this form to Google sheet and get data from sheet to python code.

Create Google form



After link with sheet



Now,Load the data from Google sheet to Python Code.Here are few Steps:

1. Google Account
2. Google Project
3. Enable Google Sheet API
4. Create a Consent Application
5. Download credentials

Make sentiment folder and create virtual environment and go to script folder and open cmd and install packages:

- pip install google_auth_oauthlib
- pip install google_api_python_client

Backend.py File

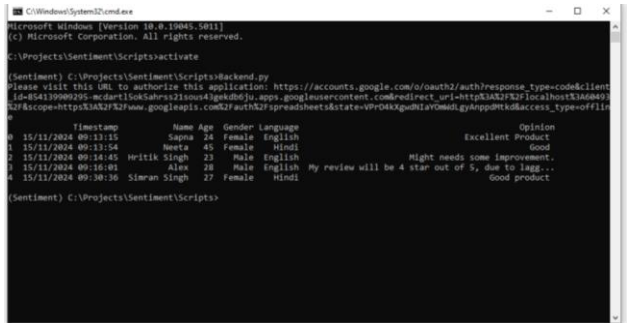
```
from google_auth_oauthlib.flow import InstalledAppFlow

from googleapiclient.discovery import build

#Permission

f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

cred=f.run_local_server(port=0)

service=build("Sheets","v4",credentials=cred).spreadsheets().values()

d=service.get(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="B:F").execute()

data=d['values']

print(data)
```

Organizing a data

Install package :pip install pandas

Backend.py

```
from google_auth_oauthlib.flow import InstalledAppFlow

from googleapiclient.discovery import build

import pandas as pd

#Permission

f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

cred=f.run_local_server(port=0)

service=build("Sheets","v4",credentials=cred).spreadsheets().values()

k=service.get(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="A:F").execute()

d=k['values']

df=pd.DataFrame(data=d[1:],columns=d[0])

print(df)
```

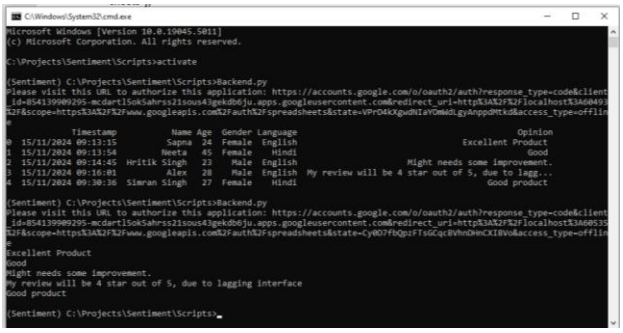


Fetch only Opinion data

Backend.py

```
from google_auth_oauthlib.flow import InstalledAppFlow
```

```
from googleapiclient.discovery import build

import pandas as pd

#Permission

f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

cred=f.run_local_server(port=0)

service=build("Sheets","v4",credentials=cred).spreadsheets().values()

k=service.get(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="A:F").execute()

d=k['values']

df=pd.DataFrame(data=d[1:],columns=d[0])

for i in range(0,len(df)):

    t=df._get_value(i,"Opinion")

    print(t)
```



Data Organizing and Data Visualization

Installing Package:

- pip install nltk
- pip install vanderSentiment

Backend.py file

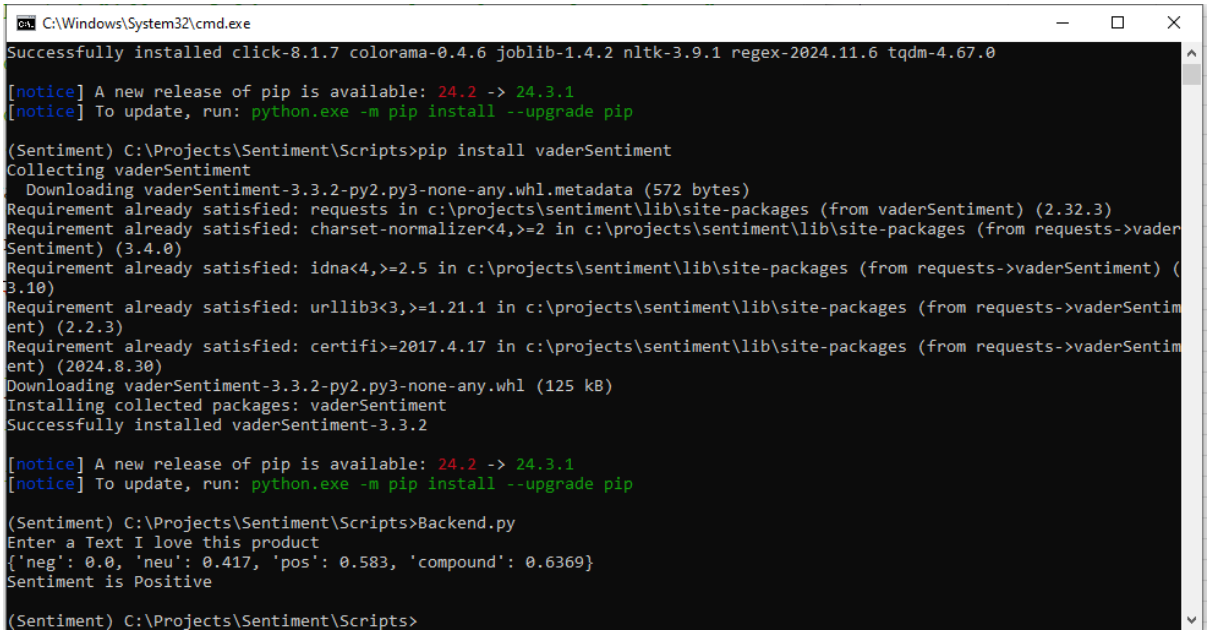
#To analyze the given text whether it is positive, negative or neutral

```
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

k=input("Enter a Text")

mymodel=SentimentIntensityAnalyzer()

pred=mymodel.polarity_scores(k)
```

#Printing Dictionary value of prediction

```
print(pred)

if(pred['compound']>0.5):
    print("Sentiment is Positive")
elif(pred['compound']<-0.5):
    print("Sentiment is Negative")
else:
    print("Sentiment is Neutral")
```

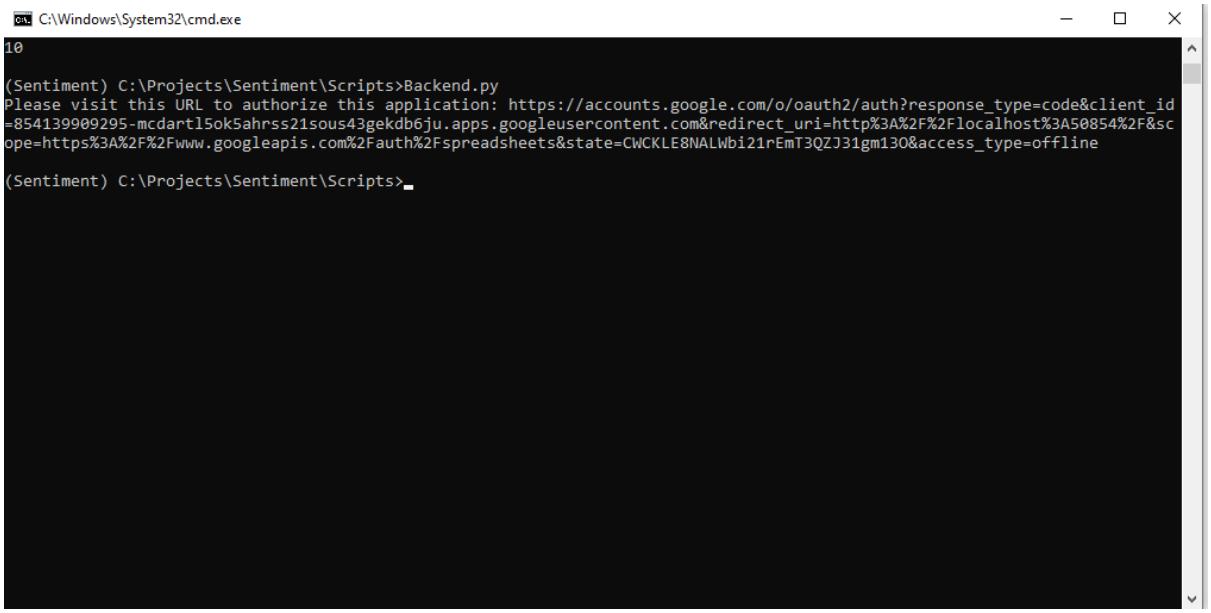
output:

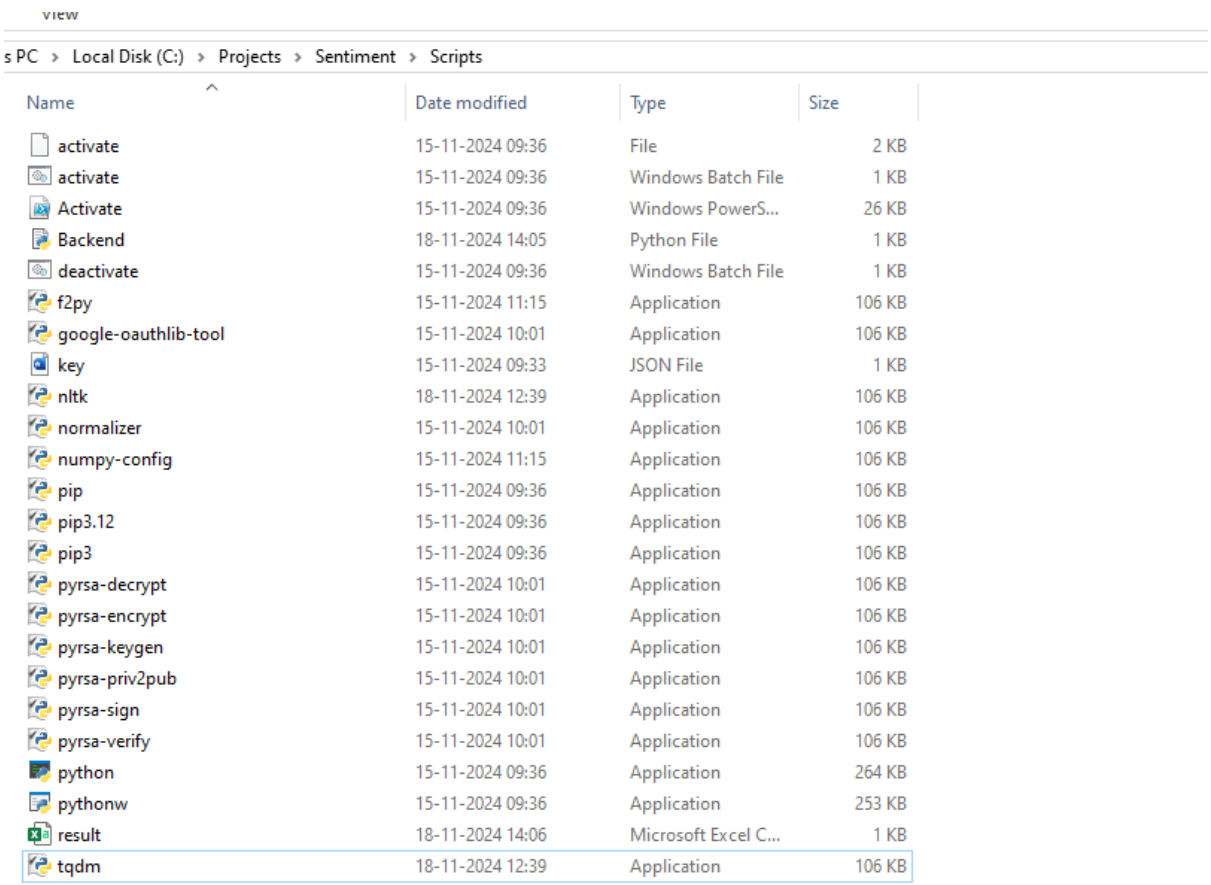


Doing Sentiment Analyses on sheet data and store it into a device by name of result.csv

```
from google_auth_oauthlib.flow import InstalledAppFlow

from googleapiclient.discovery import build

from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

import pandas as pd

mymodel=SentimentIntensityAnalyzer()

#Permission

f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

cred=f.run_local_server(port=0)

service=build("Sheets","v4",credentials=cred).spreadsheets().values()

k=service.get(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="B:F").execute()

d=k['values']

df=pd.DataFrame(data=d[1:],columns=d[0])

#print(df)

l=[]

for i in range(0,len(df)):

    t=df._get_value(i,"Opinion")

    print(i)

    pred=mymodel.polarity_scores(t)

    if(pred['compound']>0.5):

        l.append("Positive")

    elif(pred['compound']<-0.5):

        l.append("Negative")

    else:

        l.append("Neutral")

df['Sentiment']=l

df.to_csv("result.csv",index=False)
```

Output:





Data Visualization

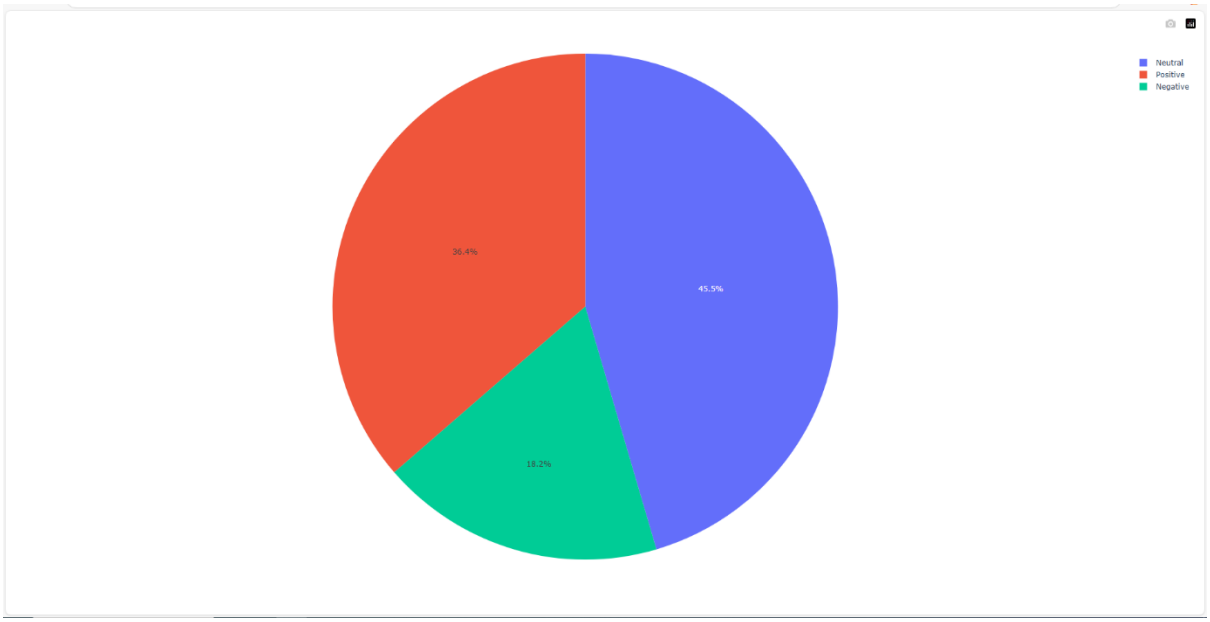
Installing Package

pip install plotly

Backend.py File

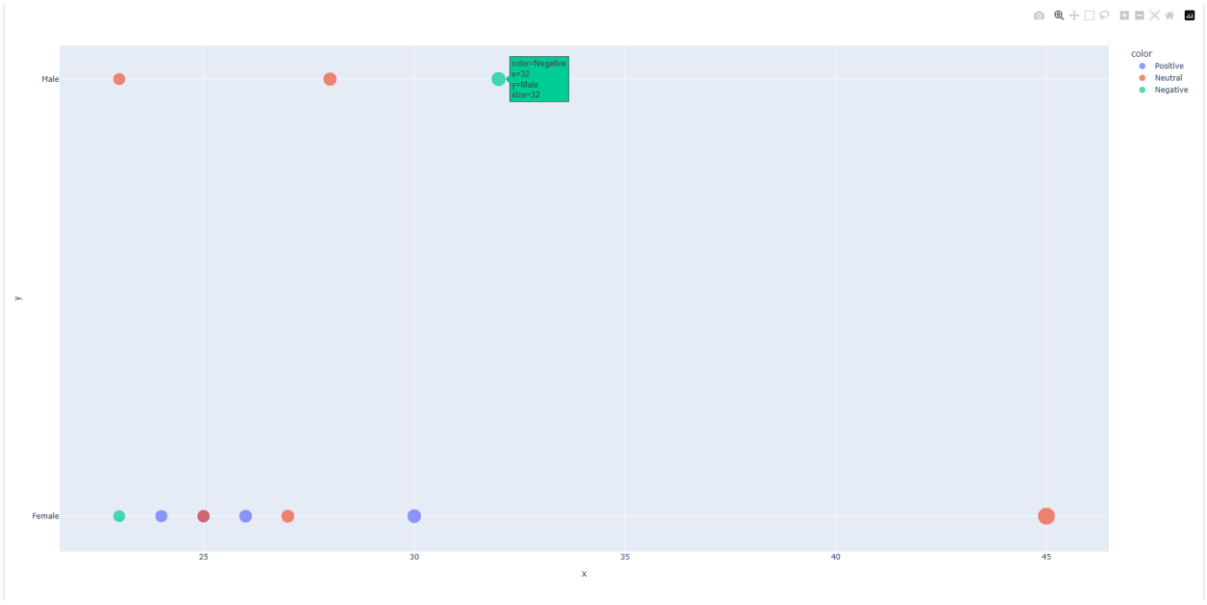
```
import pandas as pd
import plotly.express as px
df=pd.read_csv("result.csv")
#Draw a Pie Chart
posper=(len(df[df['Sentiment']=='Positive'])/len(df))*100
negper=(len(df[df['Sentiment']=='Negative'])/len(df))*100
neuper=(len(df[df['Sentiment']=='Neutral'])/len(df))*100
fig=px.pie(values=[posper,negper,neuper],names=['Positive','Negative','Neutral'])
fig.show()
```

Output Screen-

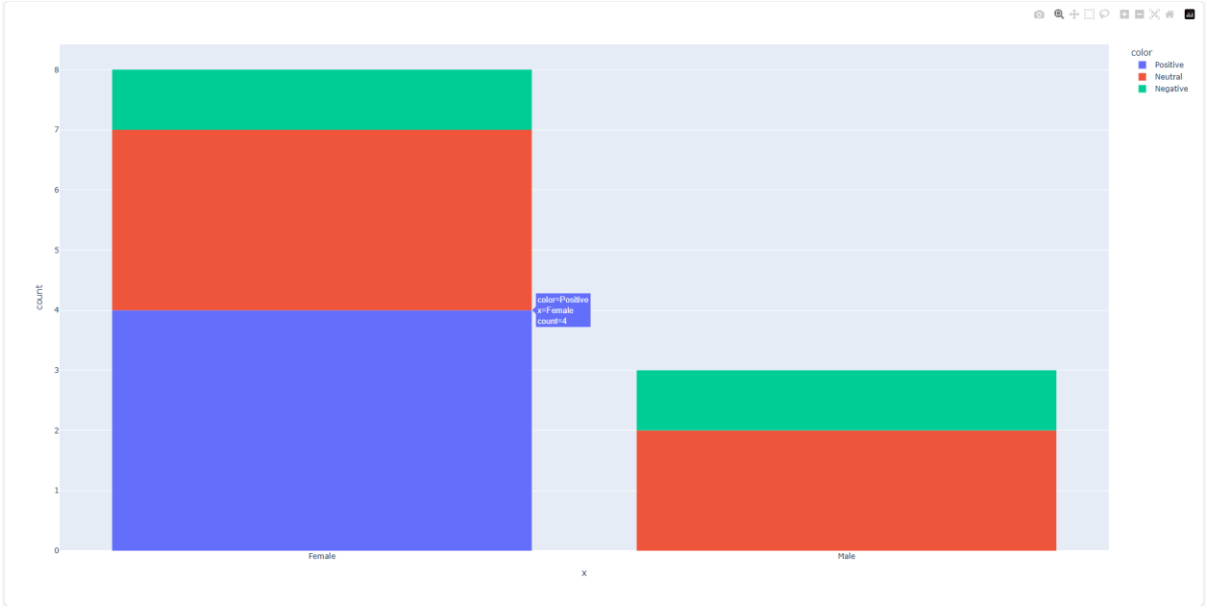


Plot scatter from result.csv file

```
import pandas as pd
import plotly.express as px
df=pd.read_csv("result.csv")
#Draw a Scatter Chart
fig=px.scatter(x=df['Age'],y=df['Gender'],color=df['Sentiment'],size=df['Age'])
fig.show()
```



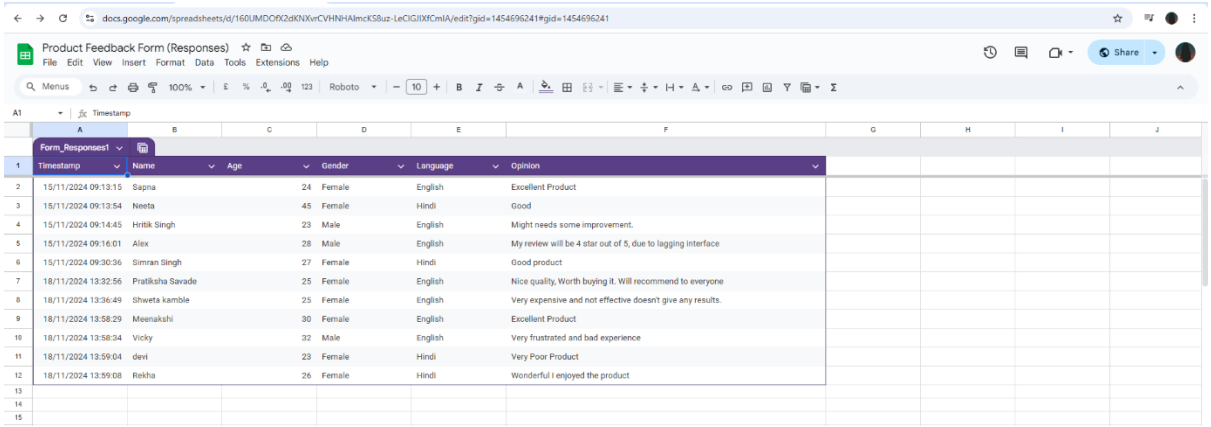

```
import pandas as pd
import plotly.express as px
df=pd.read_csv("result.csv")
#Draw a Histogram
fig=px.histogram(x=df['Gender'],color=df['Sentiment'])
fig.show()
```



Read the Data from Google Sheet and wrote the data on Google sheet

Make sure that your sheet can in editor access mode

Before Screen Of Google sheet



Product Feedback Form (Responses)

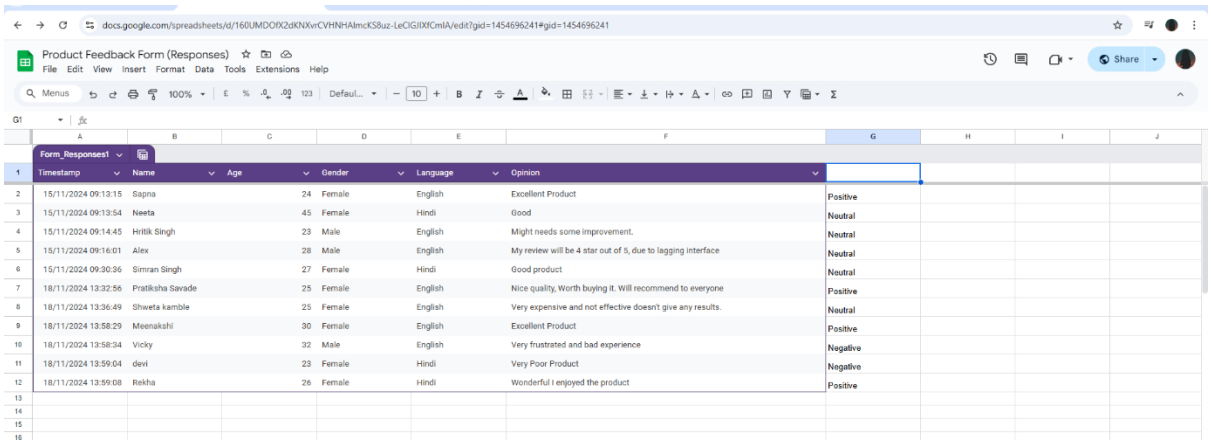
Form_Responses1

Timestamp	Name	Age	Gender	Language	Opinion
15/11/2024 09:13:15	Sapna	24	Female	English	Excellent Product
15/11/2024 09:13:54	Neeta	45	Female	Hindi	Good
15/11/2024 09:14:45	Hritik Singh	23	Male	English	Might needs some improvement.
15/11/2024 09:16:01	Alex	28	Male	English	My review will be 4 star out of 5, due to lagging interface
15/11/2024 09:30:36	Simran Singh	27	Female	Hindi	Good product
18/11/2024 13:32:56	Pratiksha Savade	25	Female	English	Nice quality, Worth buying it. Will recommend to everyone
18/11/2024 13:36:49	Shweta kamble	25	Female	English	Very expensive and not effective doesn't give any results.
18/11/2024 13:58:29	Meenakshi	30	Female	English	Excellent Product
18/11/2024 13:58:34	Vicky	32	Male	English	Very frustrated and bad experience
18/11/2024 13:59:04	devi	23	Female	Hindi	Very Poor Product
18/11/2024 13:59:08	Rekha	26	Female	Hindi	Wonderful I enjoyed the product

Backend.py File

```
from google_auth_oauthlib.flow import InstalledAppFlow

from googleapiclient.discovery import build

from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

import pandas as pd

mymodel=SentimentIntensityAnalyzer()

#Permission

f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

cred=f.run_local_server(port=0)

service=build("Sheets","v4",credentials=cred).spreadsheets().values()

k=service.get(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="B:F").execute()

d=k['values']

df=pd.DataFrame(data=d[1:],columns=d[0])

#print(df)

l=[]

for i in range(0,len(df)):

    t=df._get_value(i,"Opinion")

    pred=mymodel.polarity_scores(t)

    if(pred['compound']>0.5):
```

```
        d[i+1].append("Positive")
    elif(pred['compound']<-0.5):
        d[i+1].append("Negative")
    else:
        d[i+1].append("Neutral")
h={'values':d}
k=service.update(spreadsheetId="160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA",range="B:G",valueInputOption="USER_ENTERED",body=h).execute()
```



Product Feedback Form (Responses)

Form_Responses1

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15/11/2024 09:16:01	Alex	28	Male	English	My review will be 4 star out of 5, due to lagging interface	Neutral
15/11/2024 09:30:36	Simran Singh	27	Female	Hindi	Good product	Neutral
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18/11/2024 13:58:29	Meenakshi	30	Female	English	Excellent Product	Positive
18/11/2024 13:58:34	Vicky	32	Male	English	Very frustrated and bad experience	Negative
18/11/2024 13:59:04	devi	23	Female	Hindi	Very Poor Product	Negative
18/11/2024 13:59:08	Rekha	26	Female	Hindi	Wonderful I enjoyed the product	Positive

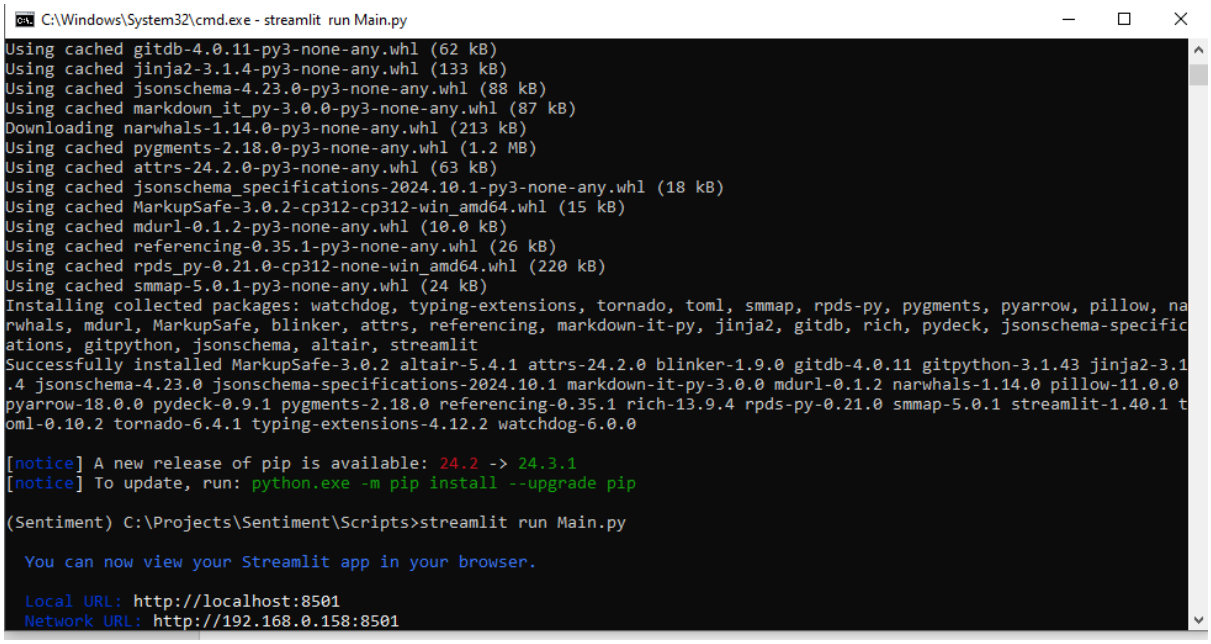
Frontend

Main.py File

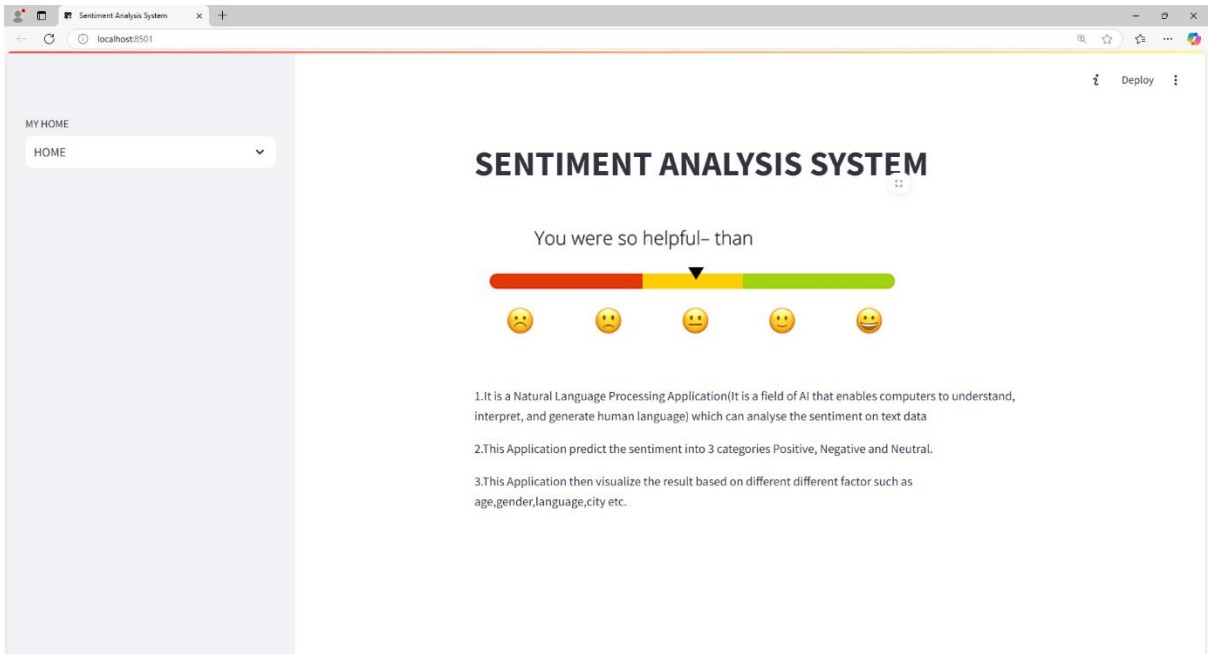
```
import streamlit as st
from google_auth_oauthlib.flow import InstalledAppFlow
from googleapiclient.discovery import build
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer
import pandas as pd
import plotly.express as px
st.set_page_config(page_title="Sentiment Analysis System",page_icon="https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQFbvzaEfqPd55moVz6zwLzUViHxuDrZuOynQ&s")
st.title("SENTIMENT ANALYSIS SYSTEM")
choice=st.sidebar.selectbox("MY HOME",("HOME","ANALYSIS","RESULTS"))
if(choice=="HOME"):
    st.image("https://miro.medium.com/v2/1*_JW1JaMpK_fVGld8pd1_JQ.gif")
```

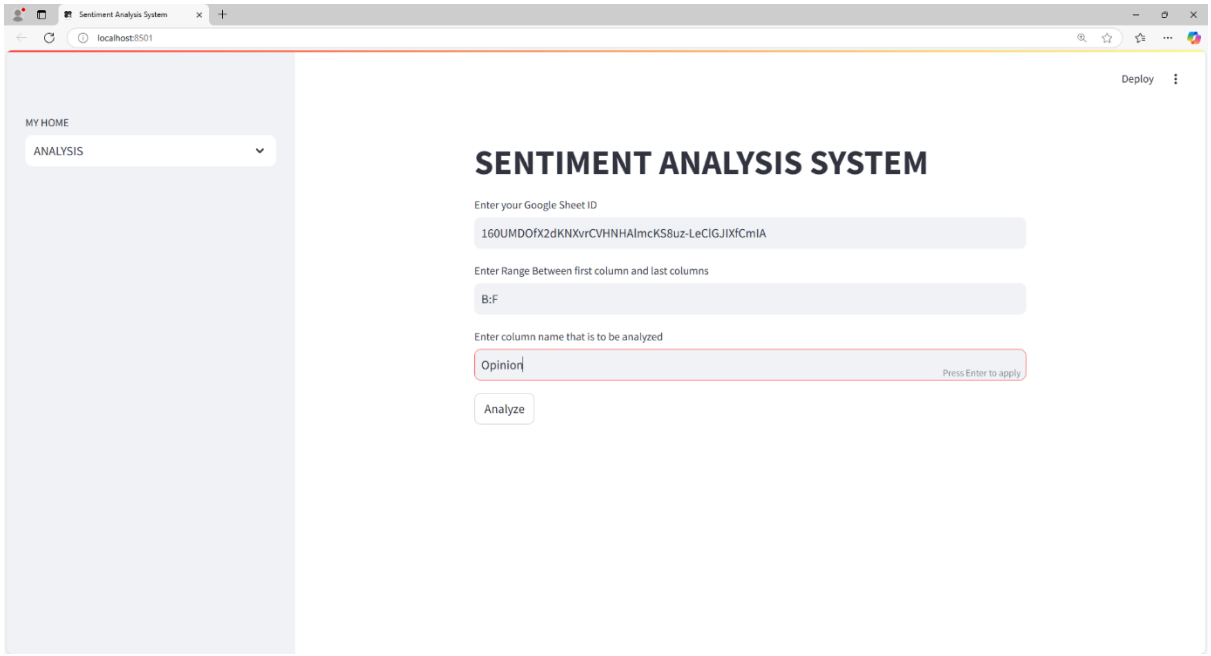
```
    st.write("1.It is a Natural Language Processing Application(It is a field of AI that enables computers to understand, interpret, and generate human language) which can analyse the sentiment on text data")

    st.write("2.This Application predict the sentiment into 3 categories Positive, Negative and Neutral.")

    st.write("3.This Application then visualize the result based on different different factor such as age,gender,language,city etc.")

elif(choice=="ANALYSIS"):

    sid=st.text_input("Enter your Google Sheet ID")

    r=st.text_input("Enter Range Between first column and last columns")

    c=st.text_input("Enter column name that is to be analyzed")

    btn=st.button("Analyze")

    if btn:

        if 'cred' not in st.session_state:


f=InstalledAppFlow.from_client_secrets_file("key.json",["https://www.googleapis.com/auth/spreadsheets"])

            st.session_state['cred']=f.run_local_server(port=0)

        mymodel=SentimentIntensityAnalyzer()

        service=build("Sheets","v4",credentials=st.session_state['cred']).spreadsheets().values()

        k=service.get(spreadsheetId=sid,range=r).execute()

        d=k['values']

        df=pd.DataFrame(data=d[1:],columns=d[0])

        l=[]

        for i in range(0,len(df)):

            t=df._get_value(i,c)

            pred=mymodel.polarity_scores(t)

            if(pred['compound']>0.5):

                l.append("Positive")

            elif(pred['compound']<-0.5):

                l.append("Negative")

            else:

                l.append("Neutral")
```

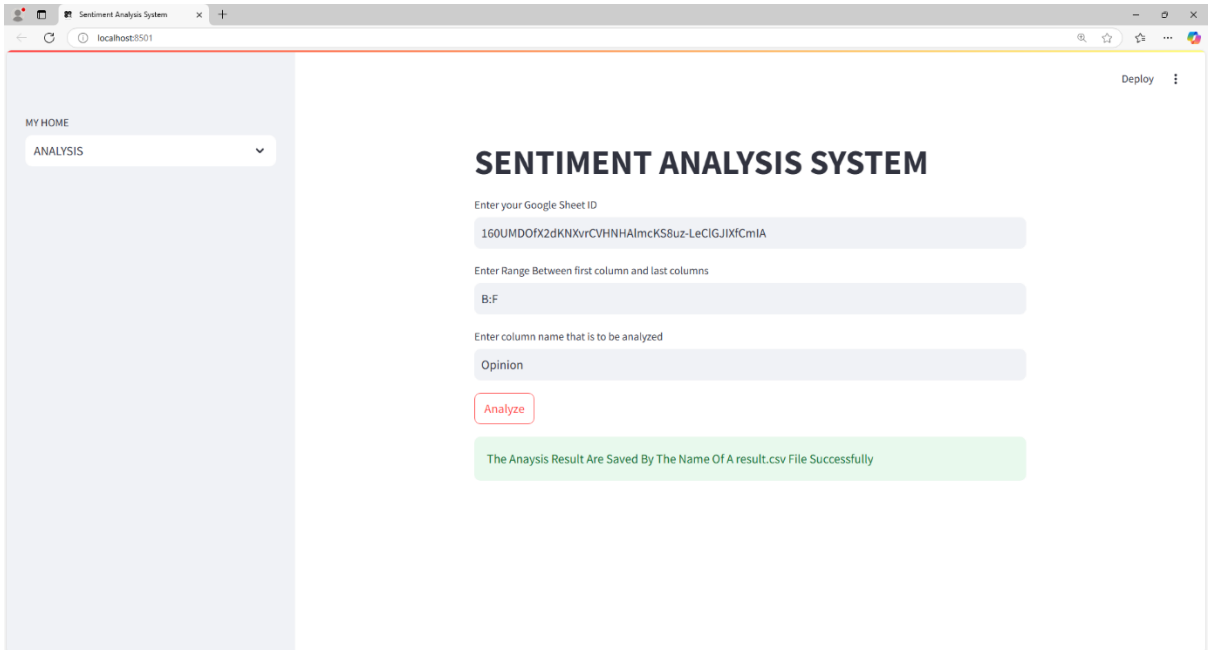
```
        df['Sentiment']=l
        df.to_csv("result.csv",index=False)
        st.success("The Anaysis Result Are Saved By The Name Of A result.csv File Successfully")
elif(choice=="RESULTS"):
    df=pd.read_csv("result.csv")
    choice2=st.selectbox("Choose Visualization",("NONE","PIE CHART","HISTOGRAM","SCATTER PLOT"))
    st.dataframe(df)
    if(choice2=="PIE CHART"):
        posper=(len(df[df['Sentiment']=='Positive'])/len(df))*100
        negper=(len(df[df['Sentiment']=='Negative'])/len(df))*100
        neuper=(len(df[df['Sentiment']=='Neutral'])/len(df))*100
        fig=px.pie(values=[posper,negper,neuper],names=['Positive','Negative','Neutral'])
        st.plotly_chart(fig)
    elif(choice2=="HISTOGRAM"):
        k=st.selectbox("Choose Column",df.columns)
        if k:
            fig=px.histogram(x=df[k],color=df['Sentiment'])
            st.plotly_chart(fig)
    elif(choice2=="SCATTER PLOT"):
        k=st.text_input("Enter the Continous column name")
        if k:
            fig=px.scatter(x=df[k],y=df['Sentiment'])
            st.plotly_chart(fig)
```

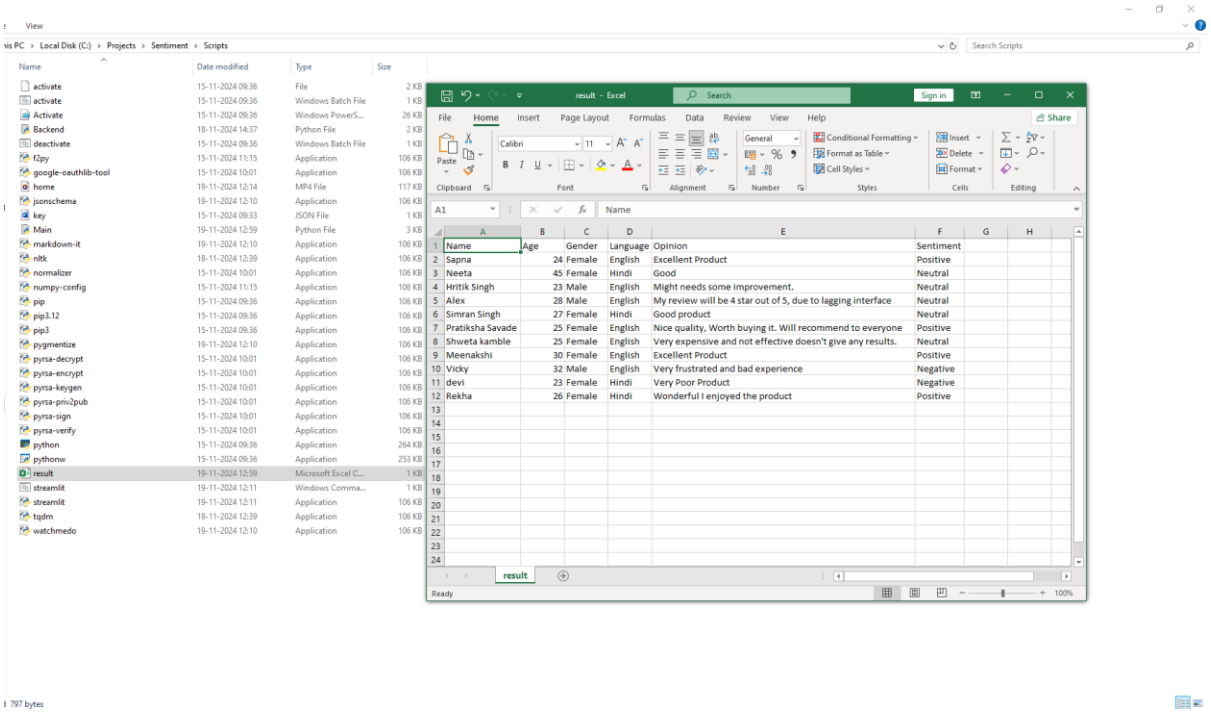


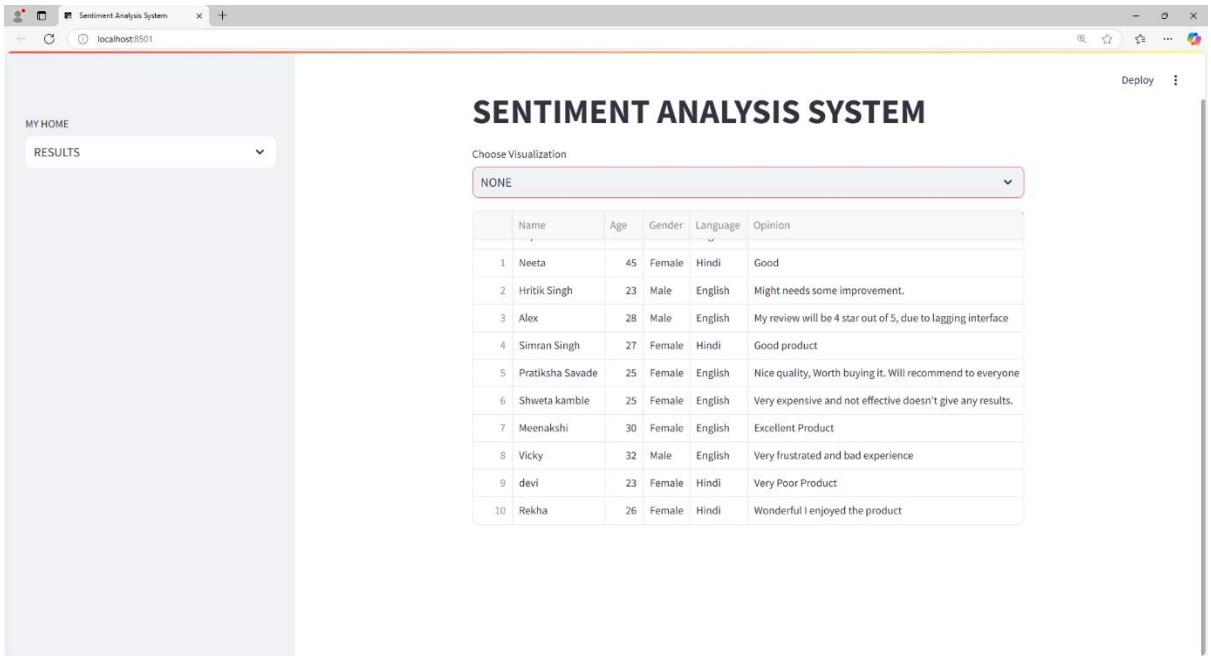
Output Screen

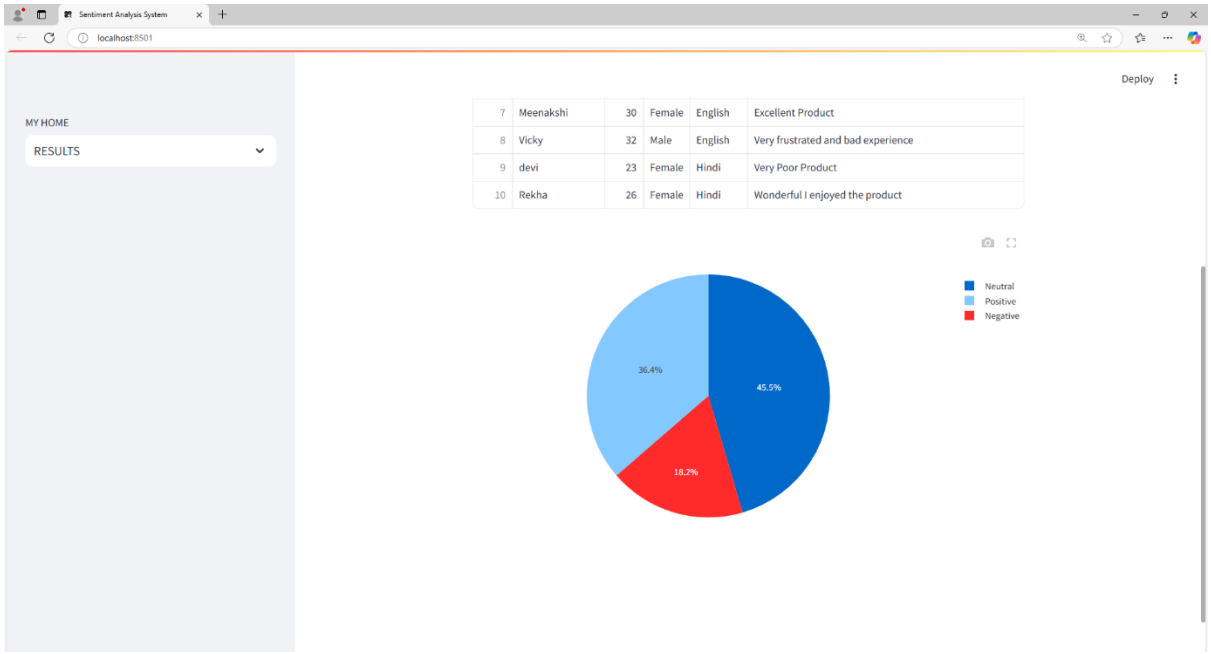


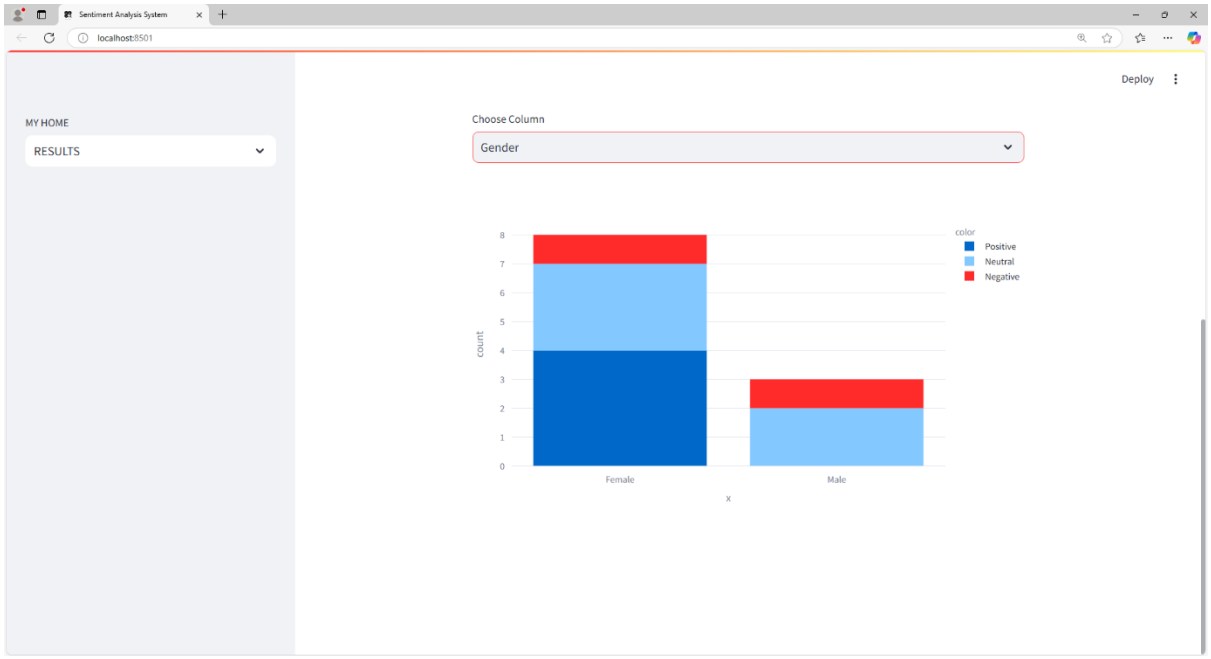

Sentiment Analysis System
localhost:8501
Deploy
MY HOME
ANALYSIS
SENTIMENT ANALYSIS SYSTEM
Enter your Google Sheet ID
160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA
Enter Range Between first column and last columns
B:F
Enter column name that is to be analyzed
Opinion
Press Enter to apply
Analyze

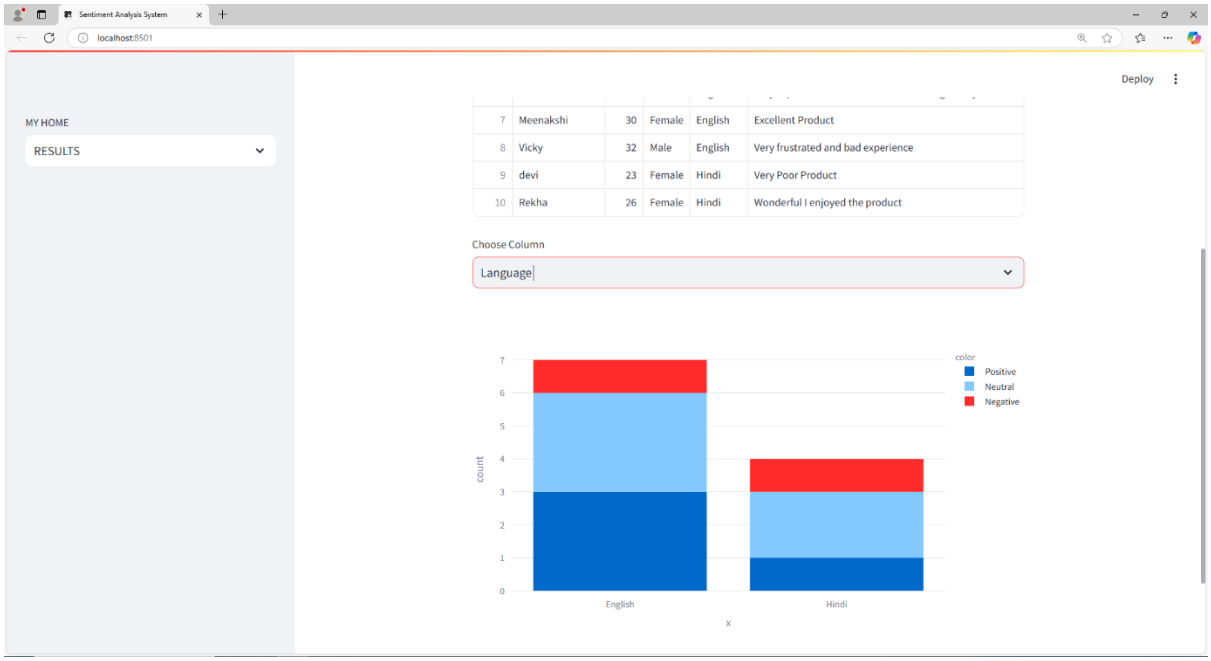

Sentiment Analysis System
localhost:8501
Deploy
MY HOME
ANALYSIS
SENTIMENT ANALYSIS SYSTEM
Enter your Google Sheet ID
160UMDOfX2dKNXvrCVHNHAlmcKS8uz-LeClGJIXfCmIA
Enter Range Between first column and last columns
B:F
Enter column name that is to be analyzed
Opinion
Analyze
The Anaysis Result Are Saved By The Name Of A result.csv File Successfully

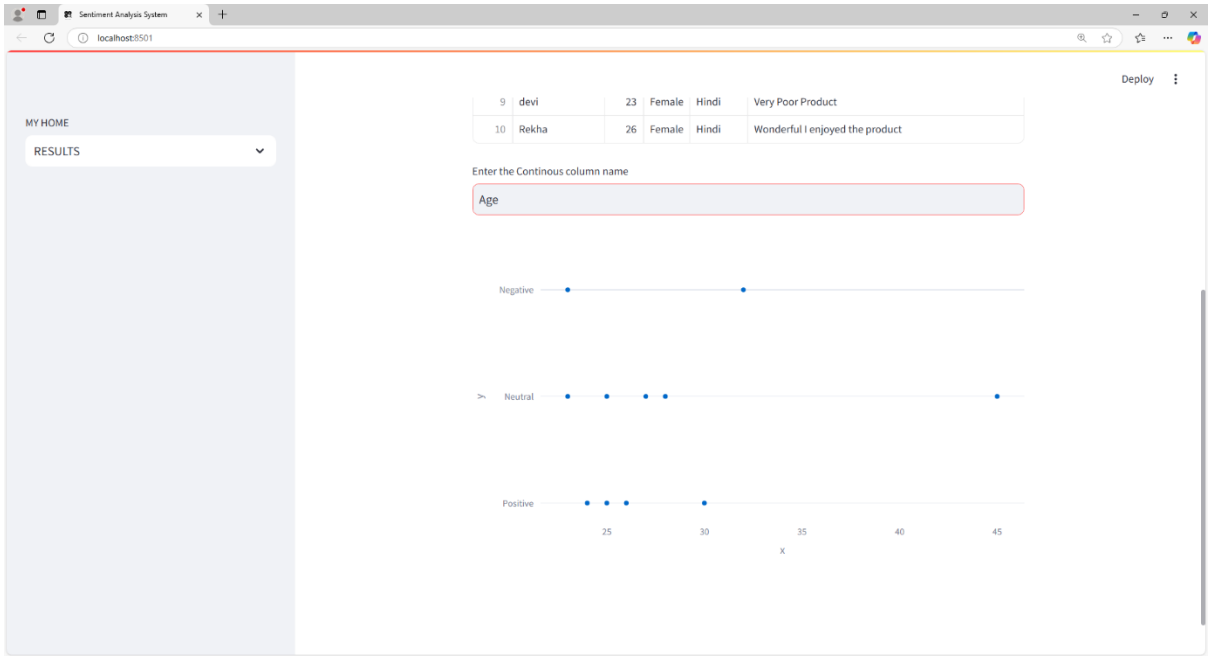

View
Local Disk (C:) › Projects › Sentiment › Scripts
Search Scripts
Name
Date modified
Type
Size
activate
Backend
Activate
deactivate
f2py
google-oauthlib-tool
home
jsonschema
key
Main
markdown-it
nltk
normalizer
numpy-config
pip
pip3.12
pip3
pygmentize
pyrsa-decrypt
pyrsa-encrypt
pyrsa-keygen
pyrsa-priv2pub
pyrsa-sign
pyrsa-verify
python
pythonw
result
streamlit
streamlit
tqdm
watchmedo
797 bytes
result - Excel
Search
Sign in
File
Home
Insert
Page Layout
Formulas
Data
Review
View
Help
Share
Paste
Clipboard
Font
Alignment
Number
Styles
Cells
Editing
Conditional Formatting
Format as Table
Cell Styles
Insert
Delete
Format
A1
Name
Name
Age
Gender
Language
Opinion
Sentiment
Sapna 24 Female English Excellent Product Positive
Neeta 45 Female Hindi Good Neutral
Hritik Singh 23 Male English Might needs some improvement. Neutral
Alex 28 Male English My review will be 4 star out of 5, due to lagging interface Neutral
Simran Singh 27 Female Hindi Good product Neutral
Pratiksha Savade 25 Female English Nice quality, Worth buying it. Will recommend to everyone Positive
Shweta kamble 25 Female English Very expensive and not effective doesn't give any results. Neutral
Meenakshi 30 Female English Excellent Product Positive
Vicky 32 Male English Very frustrated and bad experience Negative
devi 23 Female Hindi Very Poor Product Negative
Rekha 26 Female Hindi Wonderful I enjoyed the product Positive
result
Ready
100%


Sentiment Analysis System
localhost:8501
Deploy
MY HOME
RESULTS
SENTIMENT ANALYSIS SYSTEM
Choose Visualization
NONE
Name
Age
Gender
Language
Opinion
1 Neeta 45 Female Hindi Good
2 Hritik Singh 23 Male English Might needs some improvement.
3 Alex 28 Male English My review will be 4 star out of 5, due to lagging interface
4 Simran Singh 27 Female Hindi Good product
5 Pratiksha Savade 25 Female English Nice quality, Worth buying it. Will recommend to everyone
6 Shweta kamble 25 Female English Very expensive and not effective doesn't give any results.
7 Meenakshi 30 Female English Excellent Product
8 Vicky 32 Male English Very frustrated and bad experience
9 devi 23 Female Hindi Very Poor Product
10 Rekha 26 Female Hindi Wonderful I enjoyed the product


Sentiment Analysis System
localhost:8501
Deploy
MY HOME
RESULTS
7 Meenakshi 30 Female English Excellent Product
8 Vicky 32 Male English Very frustrated and bad experience
9 devi 23 Female Hindi Very Poor Product
10 Rekha 26 Female Hindi Wonderful I enjoyed the product
Neutral
Positive
Negative
36.4%
45.5%
18.2%


Sentiment Analysis System
localhost:8501
Deploy
MY HOME
RESULTS
Choose Column
Gender
color
Positive
Neutral
Negative
count
0
1
2
3
4
5
6
7
8
Female
Male
x


Sentiment Analysis System
localhost:8501
Deploy
MY HOME
RESULTS
7 Meenakshi 30 Female English Excellent Product
8 Vicky 32 Male English Very frustrated and bad experience
9 devi 23 Female Hindi Very Poor Product
10 Rekha 26 Female Hindi Wonderful I enjoyed the product
Choose Column
Language
color
Positive
Neutral
Negative
count
English
Hindi
x


Sentiment Analysis System
localhost:8501
Deploy
MY HOME
RESULTS
9 devi 23 Female Hindi Very Poor Product
10 Rekha 26 Female Hindi Wonderful I enjoyed the product
Enter the Continous column name
Age
Negative
Neutral
Positive
25
30
35
40
45
x