Amazon Review Sentiment Analysis System

Overview

What

1. It is a Natural Language Processing application which can analyze the sentiment on the amazon customer review text data.
2. This application predicts the sentiment into 3 categories:
    a. Positive
    b. Negative
    c. Neutral
3. This application then visualizes the results based on various factors like gadget type, gender, language, and review etc.
4. This application can get the data from google forms through a google sheet.
5. This application is a web application which can access over a LAN.

Why

1. This application can be used in many use cases such as product/service monitoring, survey analysis, social media monitoring and feedback analysis etc.
2. This kind of project shows Machine Learning knowledge, Programming skills, web development skills and practical implementation of Natural Language Processing.
3. This project can be very useful for resume point of view.

How

1. **Backend**

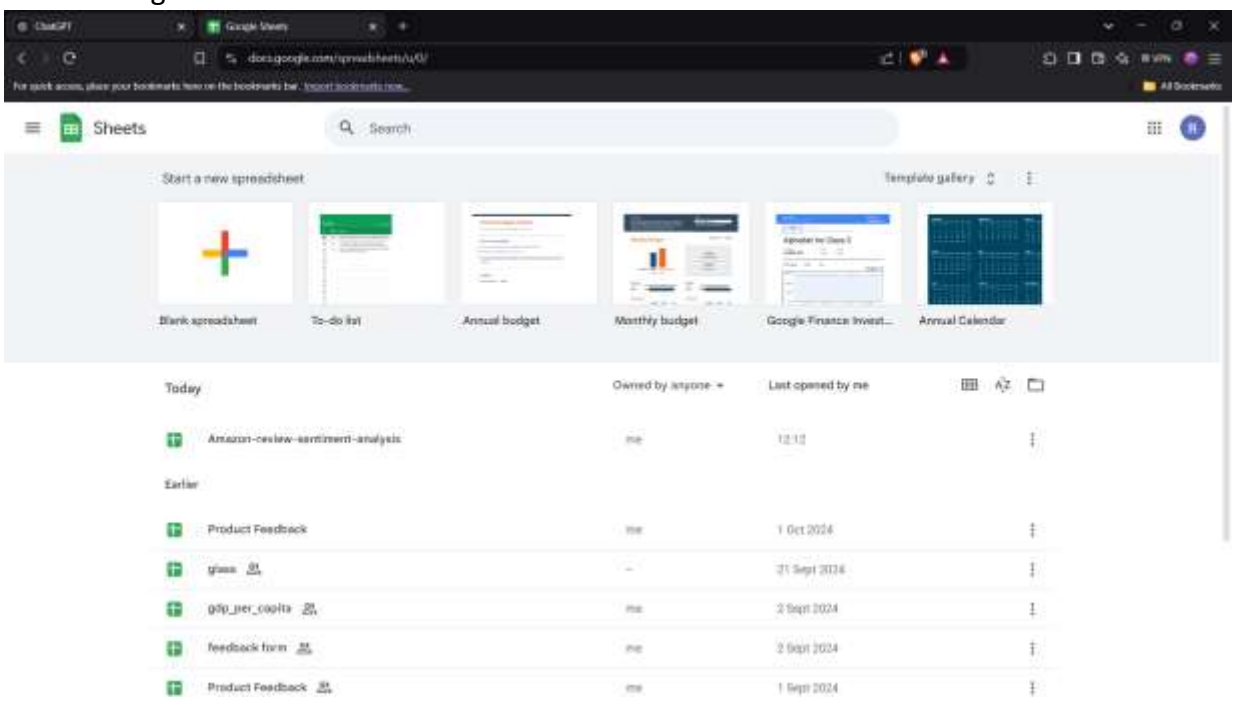
Data Collection	Google Sheets using Python
Data Organisation	Pandas
Data Analysis	NLTK, vadersentiment
Data Visualization	Plotly

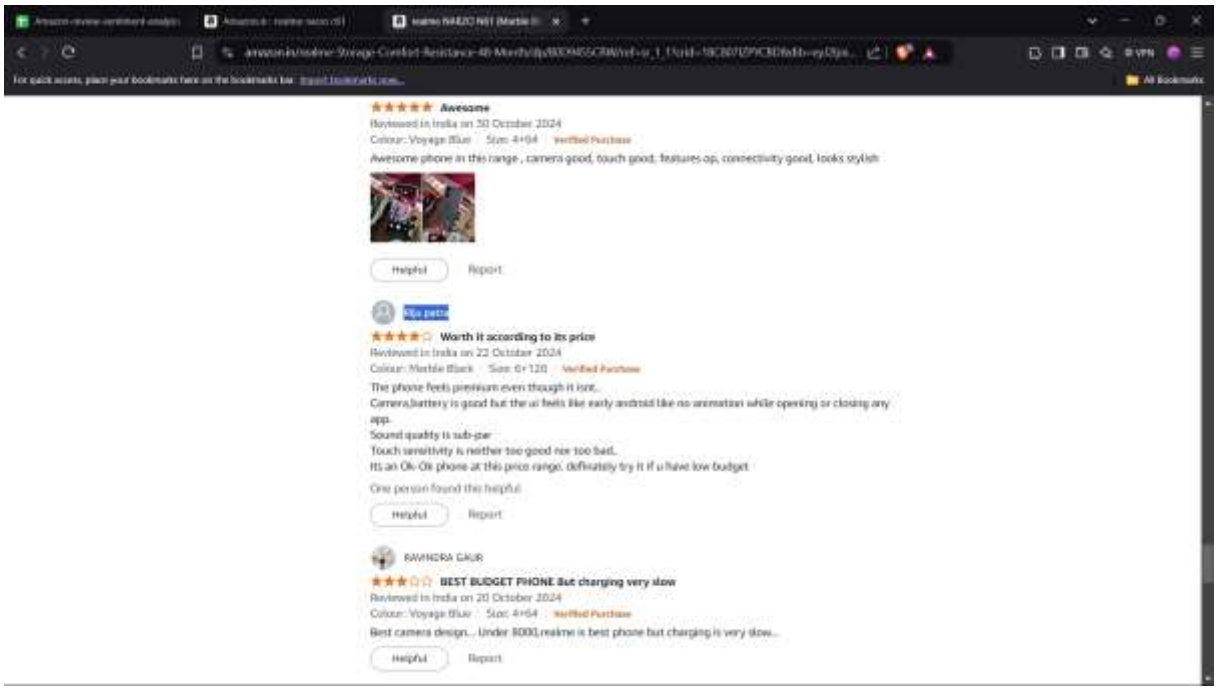
2. **Frontend**

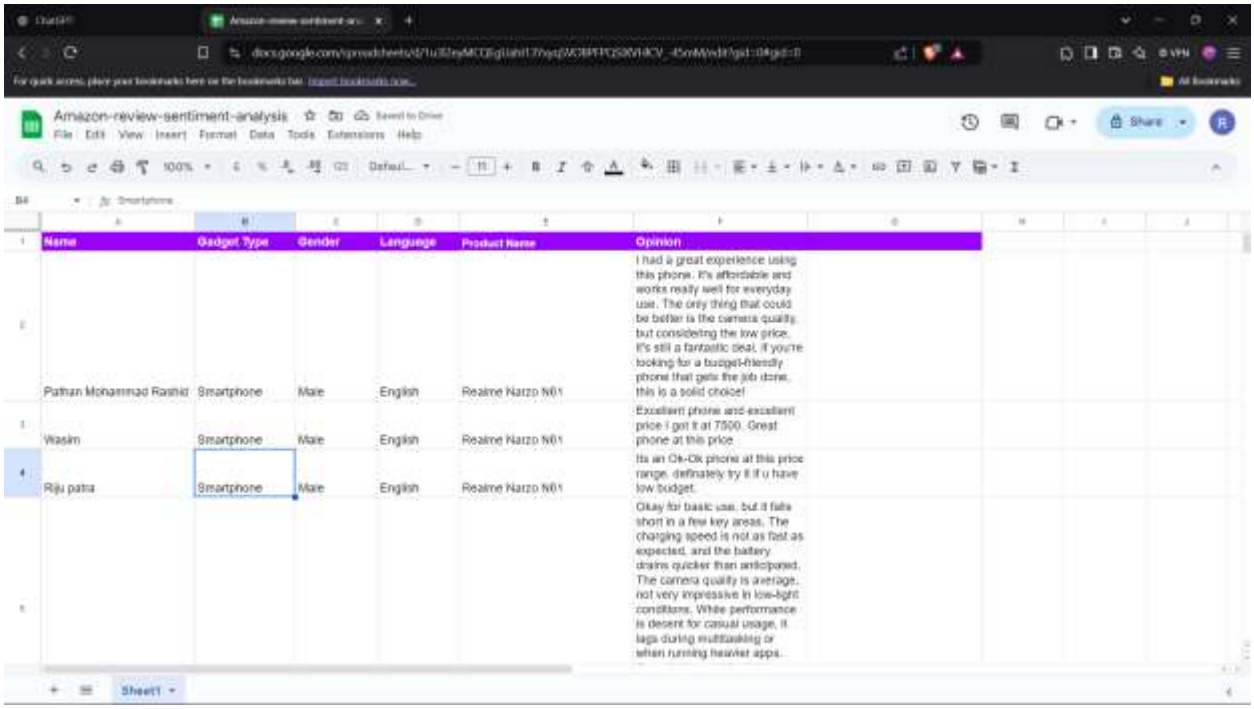
Web Application	Streamlit

Google Sheet

1. Create Google Sheet.



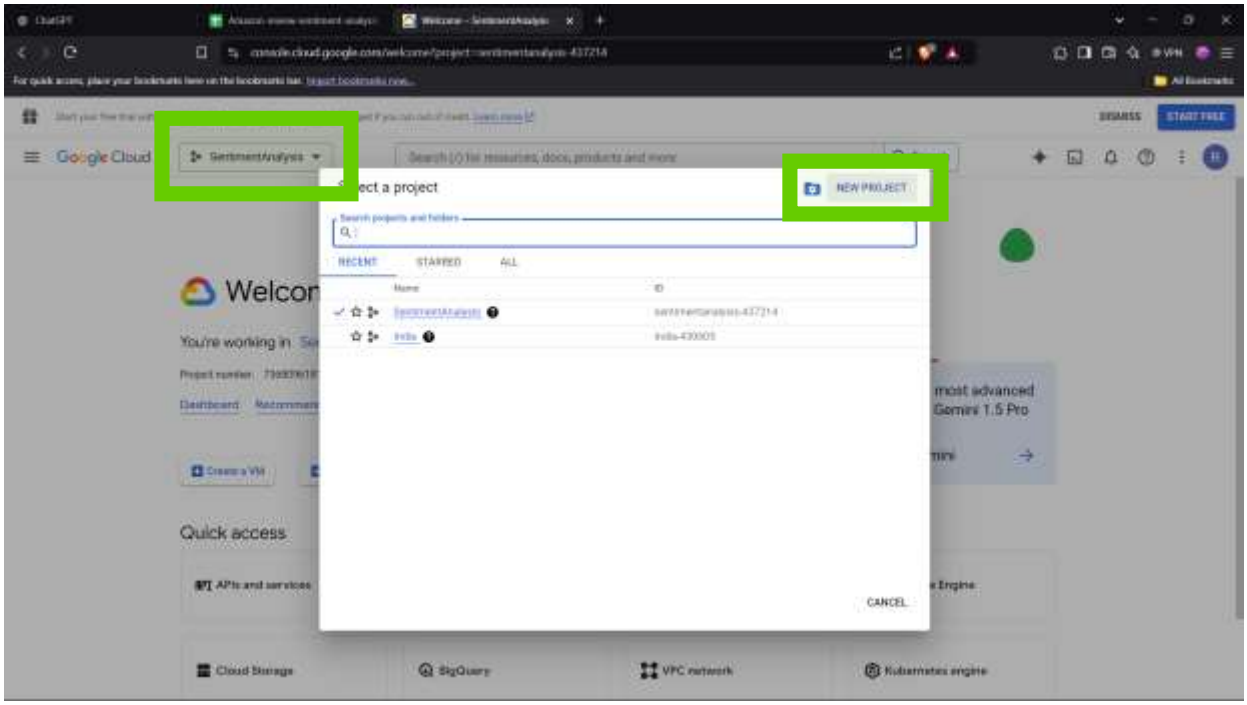


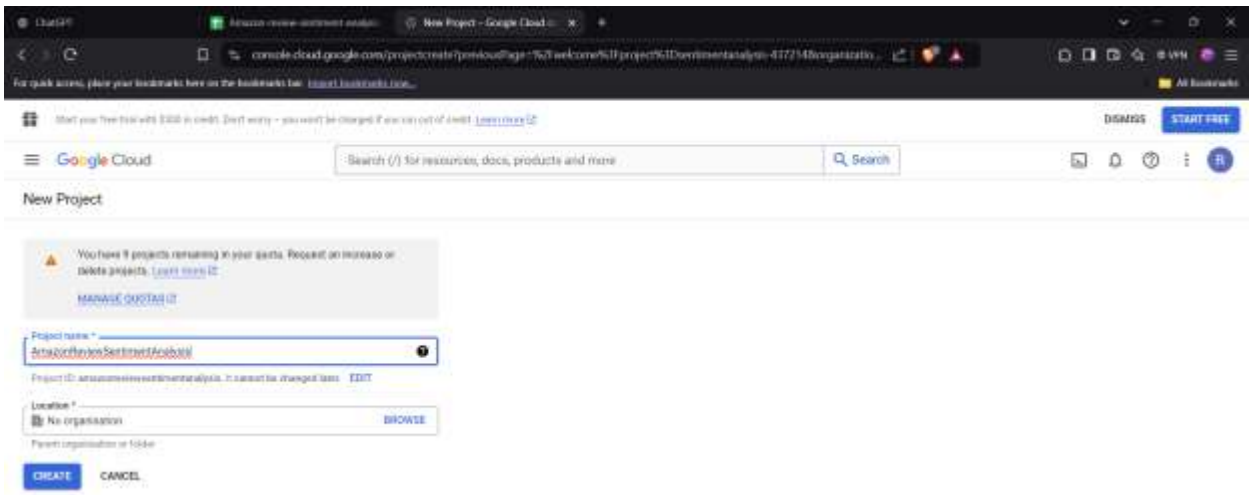


Spreadsheet Link:

https://docs.google.com/spreadsheets/d/1u3l2eyMCQEgUahI13YxyqSVOBPFPQSIXVHlCV_-45mM/edit?gid=0#gid=0

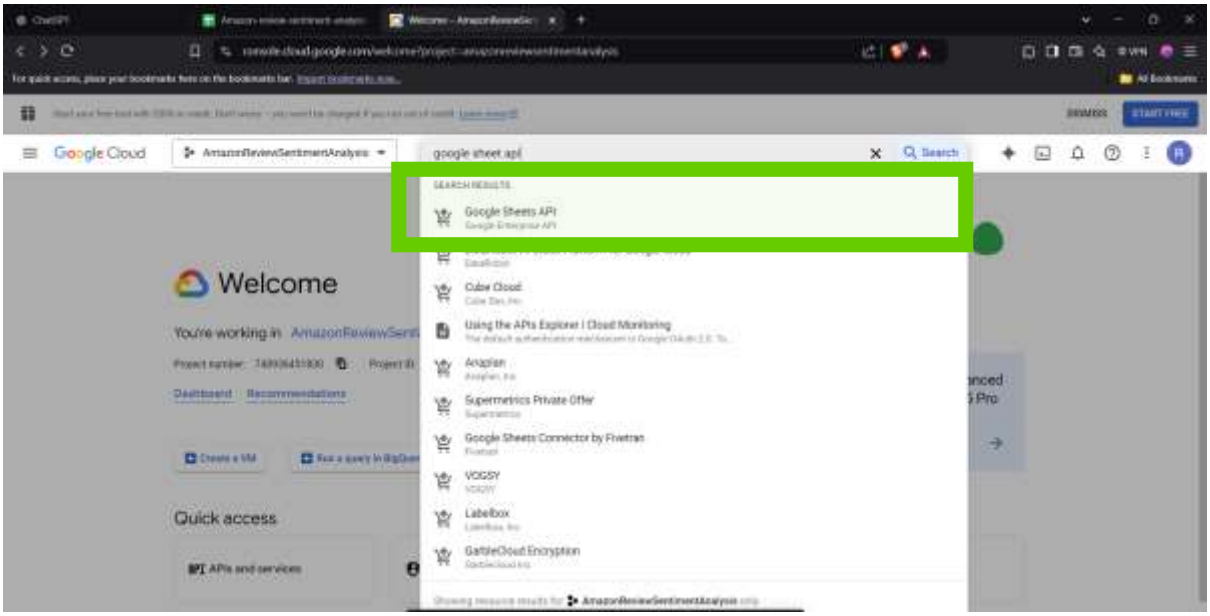
2. Create Google Project
   - Go to Google cloud platform using below link: https://console.cloud.google.com
   - Create New Project





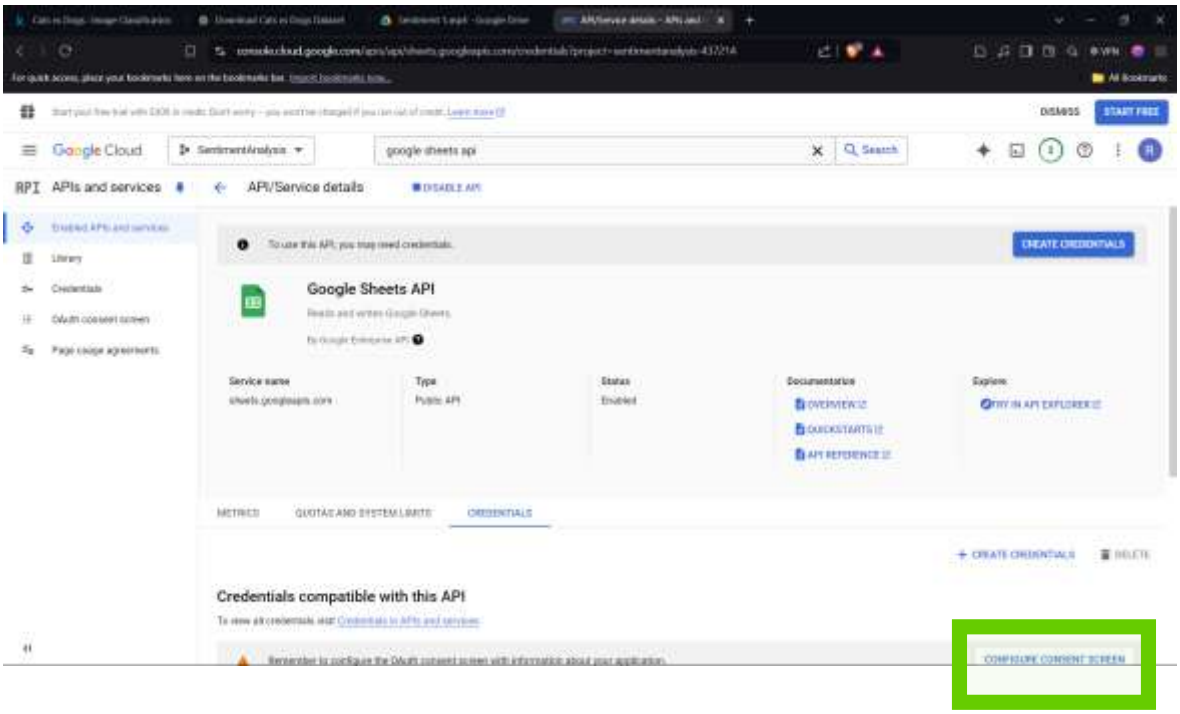
3. Create Google Sheet API

- Search “Google sheets api” in the search box

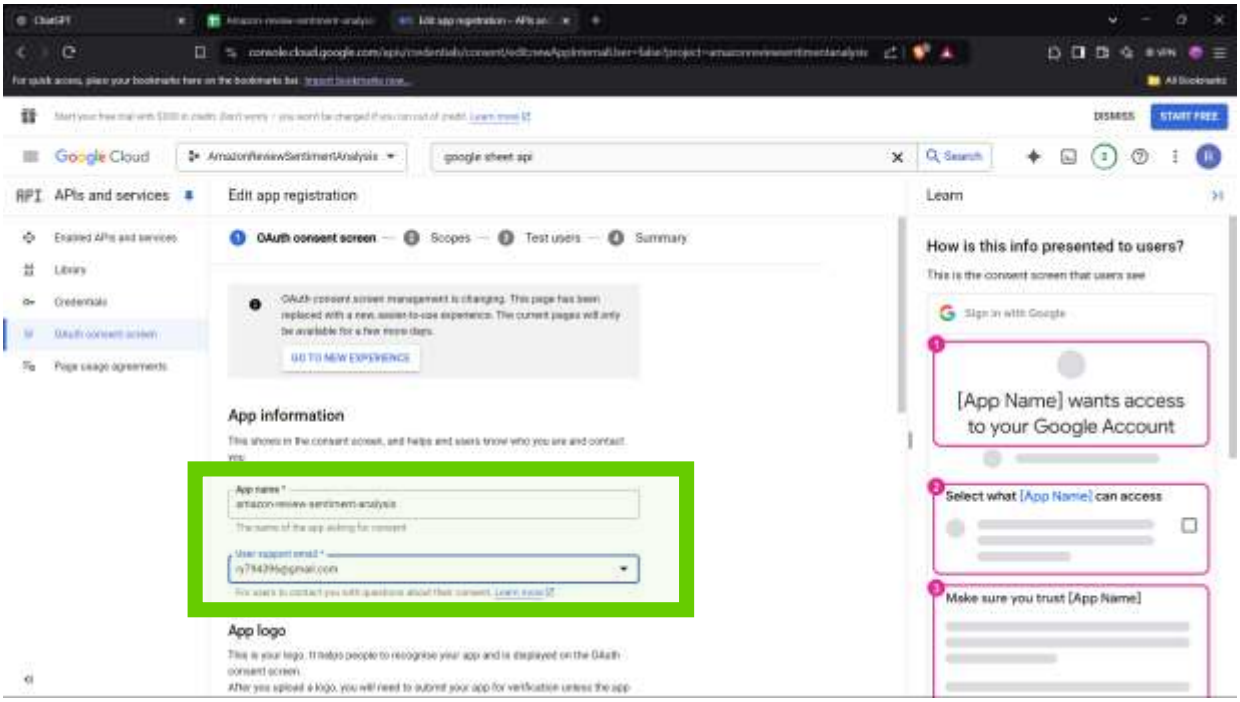


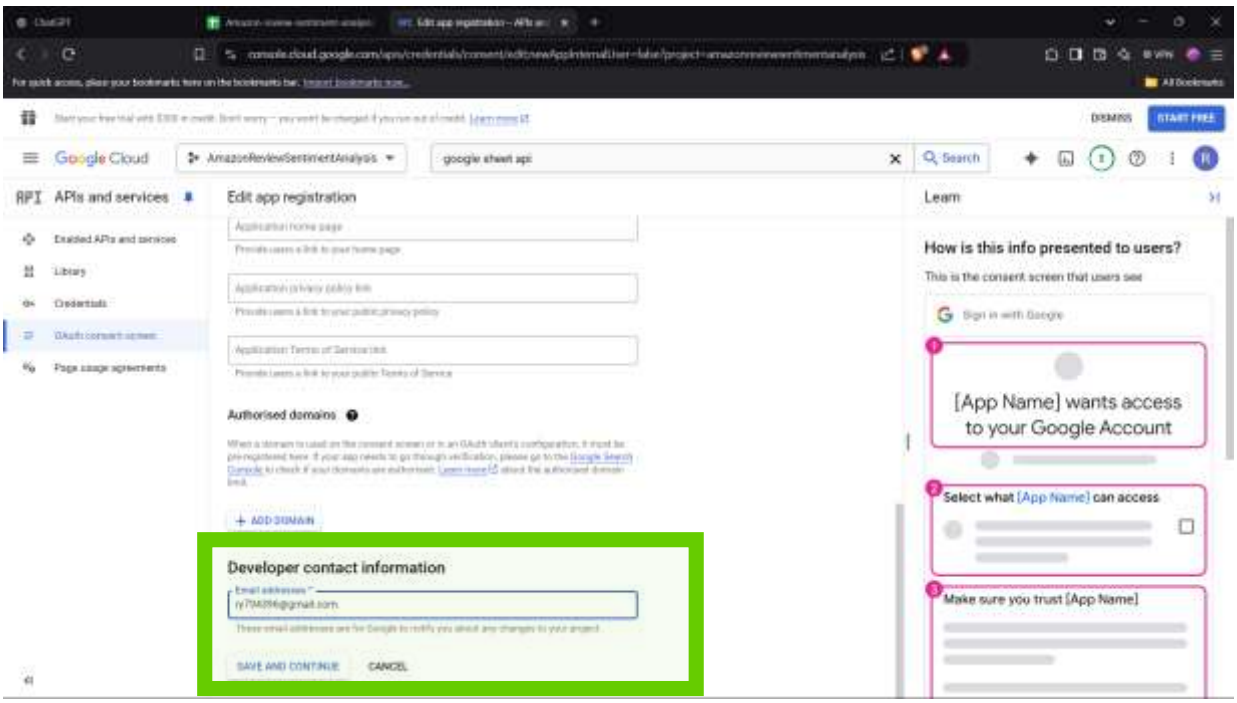
- After Clicking on Google Sheets API click ENABLE option.

4. Create a consent application.
   - Go to credentials tab in the current open page.



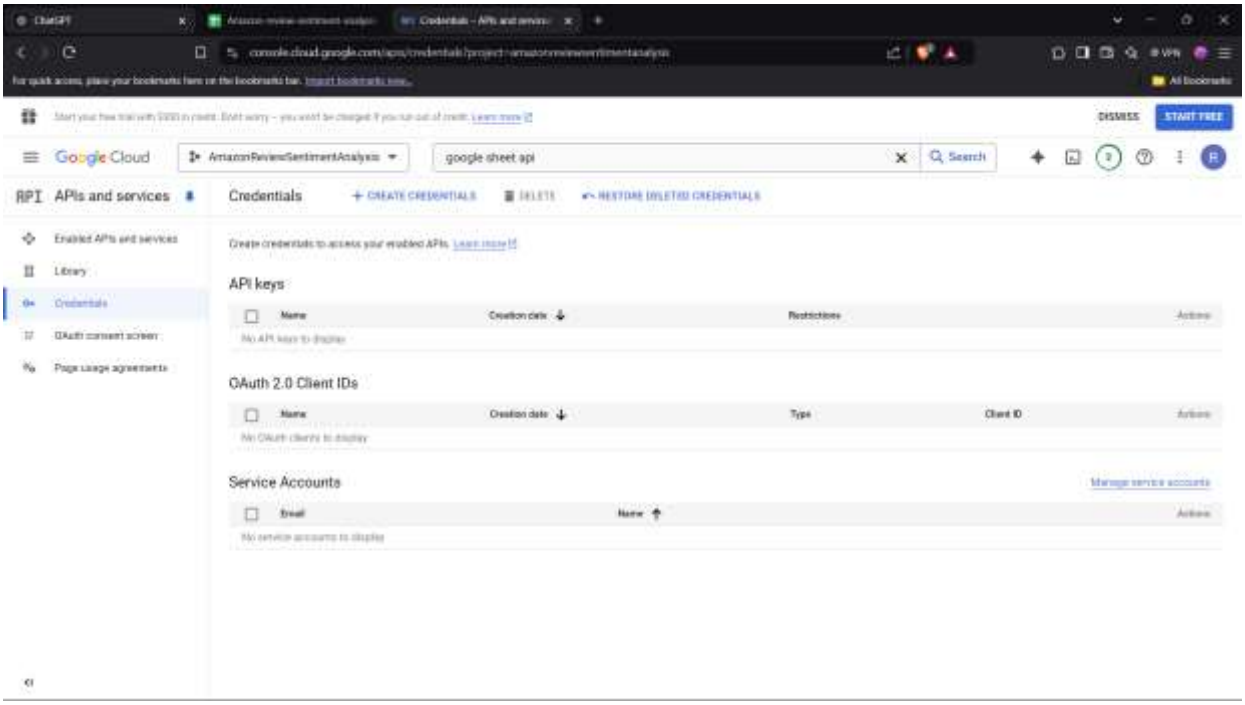
   - Click on “Configure Consent Screen” button.
   - Simply click “CREATE” button on below shown page.
   - Give “App name”, “User support email” and “Developer contact information” details and then click “Save and continue” button.

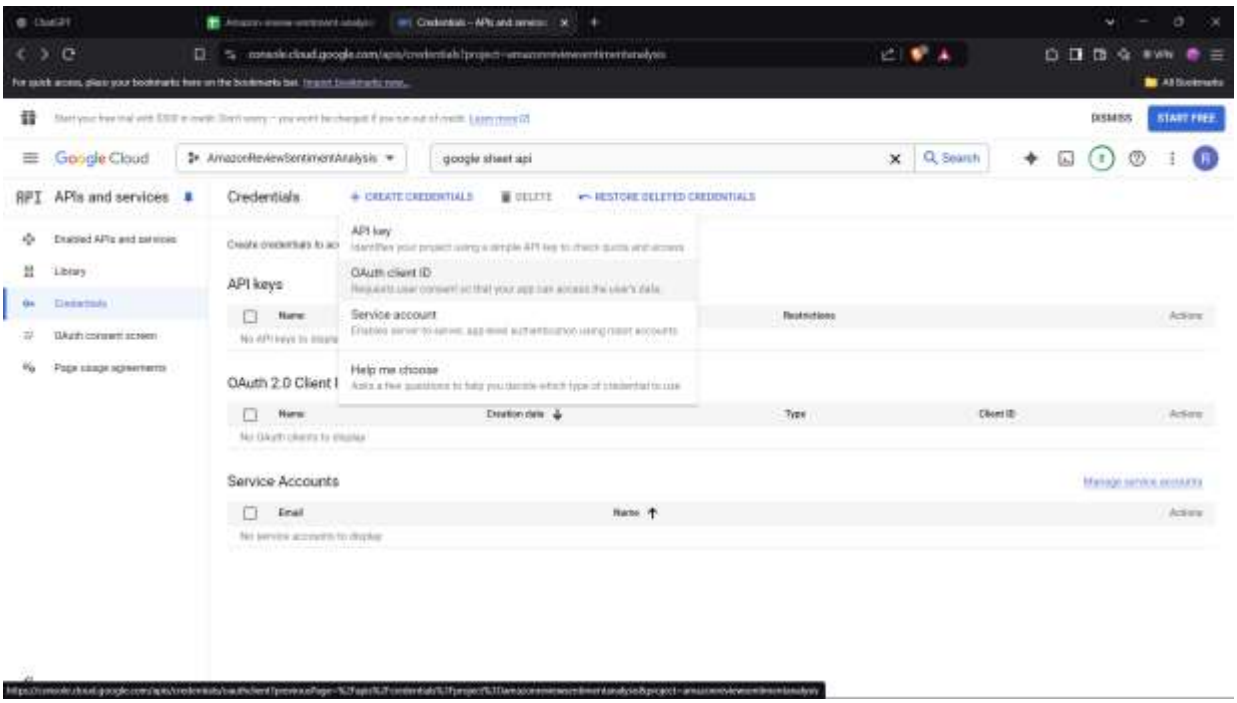


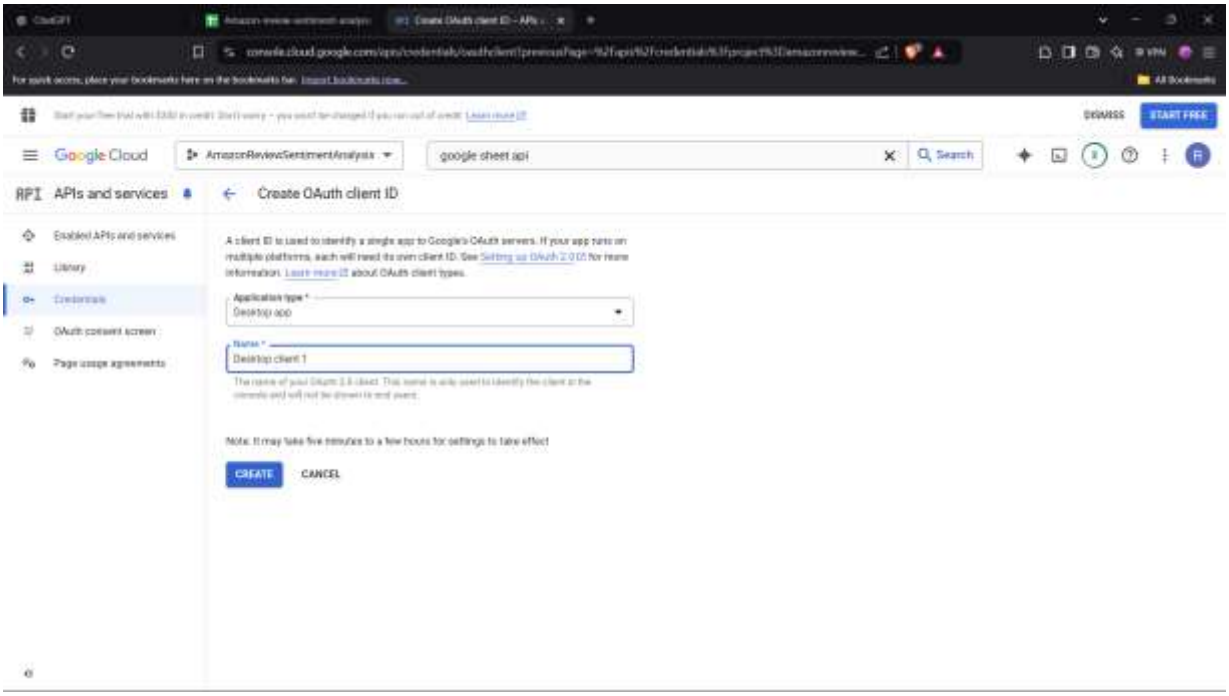


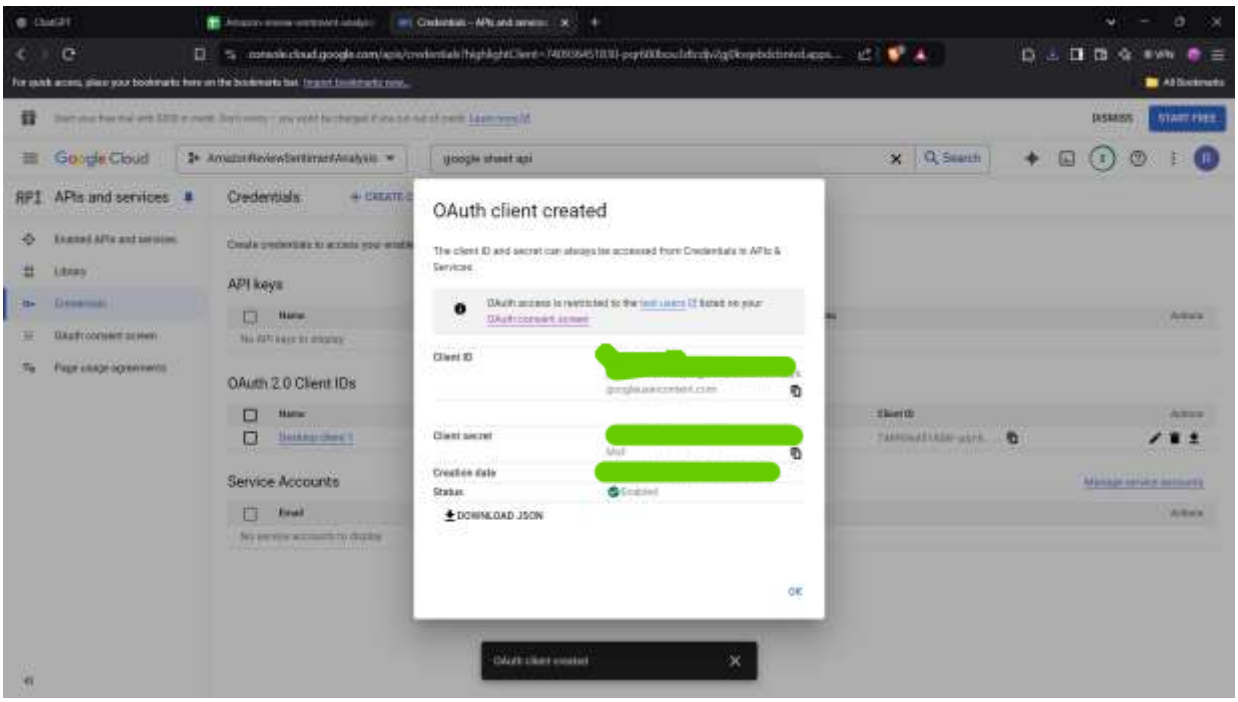
- Now simply click “Save and Continue” button on each next step.
- Now Click “Back to Dashboard” button and click “Publish app” button.

5. Download Credentials


Google Cloud
AmazonReviewSentimentAnalysis
google sheet api
Search
APIs and services
Credentials
+ CREATE CREDENTIALS
DELETE
RESTORE DELETED CREDENTIALS
Enabled APIs and services
Library
Credentials
OAuth consent screen
Page usage agreements
API keys
Name
Creation date
Restrictions
No API keys to display
OAuth 2.0 Client IDs
Name
Creation date
Type
Client ID
No OAuth clients to display
Service Accounts
Email
Name
No service accounts to display


Google Cloud
AmazonReviewSentimentAnalysis
google sheet api
Search
APIs and services
Credentials
+ CREATE CREDENTIALS
DELETE
RESTORE DELETED CREDENTIALS
API key
OAuth client ID
Service account
Help me choose
Enabled APIs and services
Library
Credentials
OAuth consent screen
Page usage agreements
API keys
Name
Restrictions
Creation date
Type
Client ID
No API keys to display
No OAuth clients to display
Service Accounts
Email
Name
No service accounts to display


Google Cloud
google sheet api
APIs and services
Create OAuth client ID
Enabled APIs and services
Library
Credentials
OAuth consent screen
Page usage agreements
Application type *
Desktop app
Name *
Desktop client 1
Note: It may take five minutes to a few hours for settings to take effect
CREATE
CANCEL


Google Cloud
google sheet api
APIs and services
Credentials
API keys
OAuth 2.0 Client IDs
Service Accounts
OAuth client created
Client ID
Client secret
Creation date
Status
DOWNLOAD JSON
OK

Setting up Environment

1. Creating virtual environment using below command:

```
Python -m venv  virtualenv_path
```

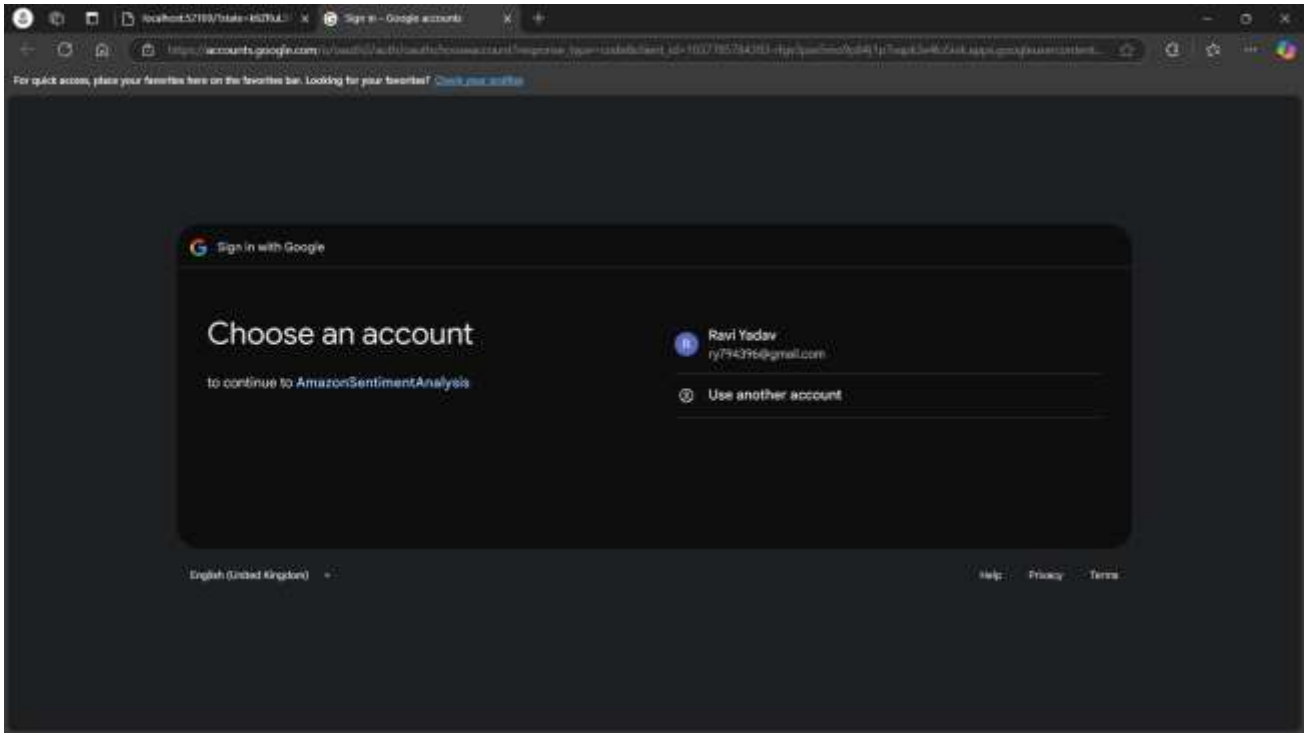
2. Install google auth library and google api client library.

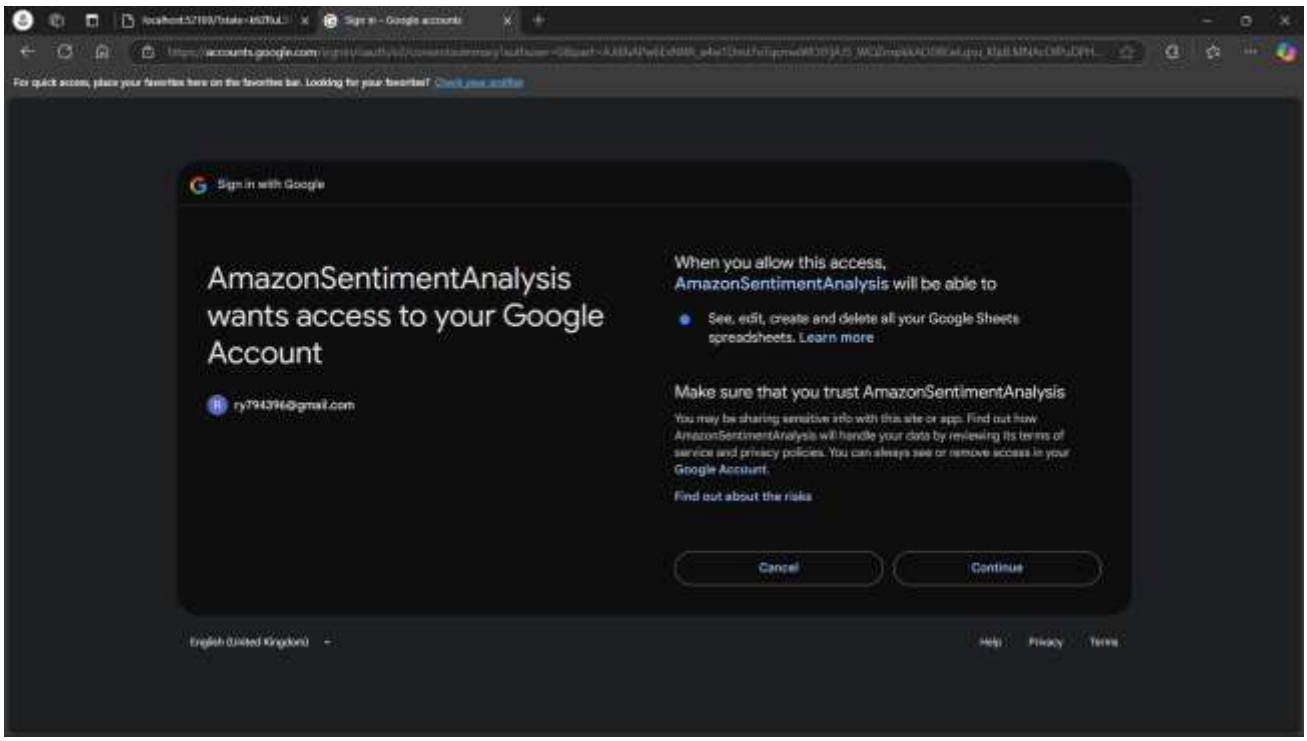
```
pip install google_auth_oauthlib
pip install google_api_python_client
```

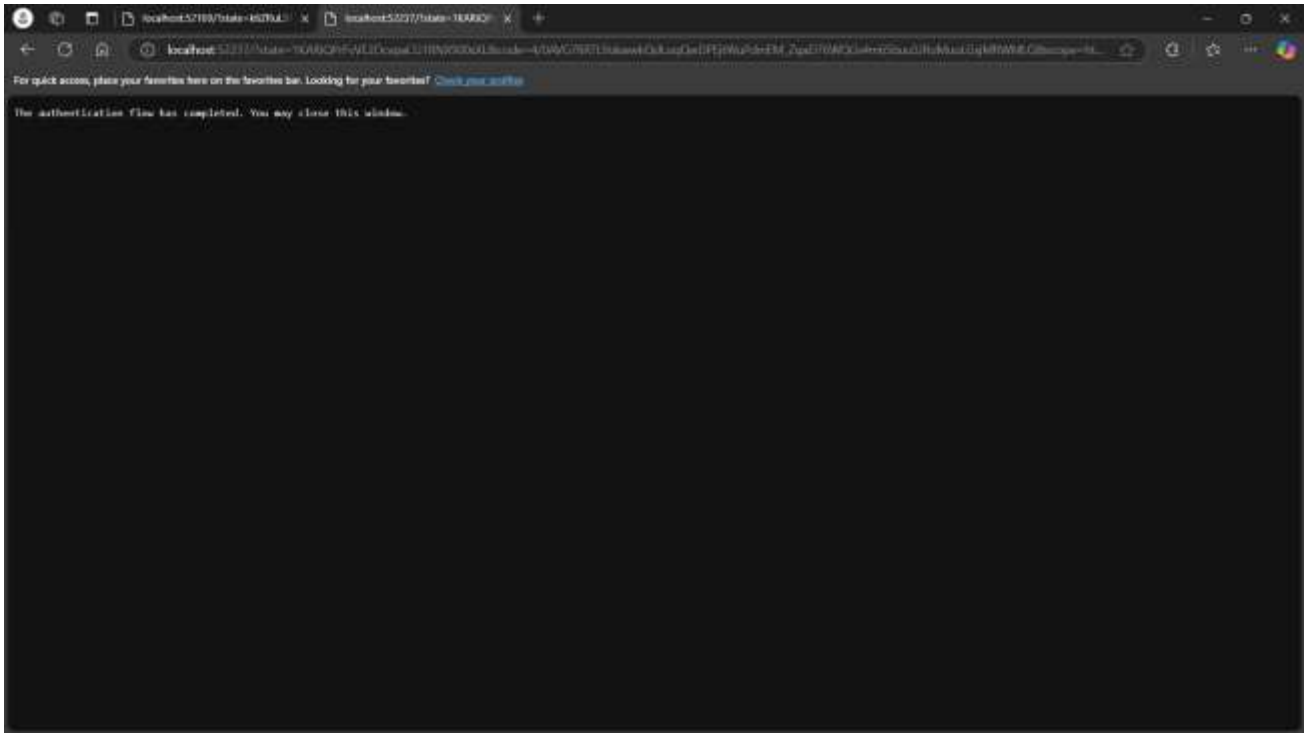
3. Establishing connection between python program and google sheet.
    - Code for creating connection

```python
from google_auth_oauthlib.flow import InstalledAppFlow
from googleapiclient.discovery import build

# Getting Permissions
f=InstalledAppFlow.from_client_secrets_file("key.json", ["https://www.googleapis.com/auth/spreadsheets"])
creds=f.run_local_server(port=0)
print(creds)
service=build("Sheets","v4", credentials=creds).spreadsheets().values()
d=service.get(spreadsheetId="1u3l2eyMCQEgUahI13YxyqSVOBPFPQSIXVHlCV_-45mM",range="B:F").execute()
data=d['values']
print(data)
```

```
<google.oauth2.credentials.Credentials object at 0x0000015BDDF4D760>

(arsa) E:\DS Course\Projects\amazon-review-sentiment-analysis\arsa>python backend.py
Please visit this URL to authorize this application: https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=1037785784393-r
fgv3pse5mo9p84j1p7vapk3e4lo5ivk.apps.googleusercontent.com&redirect_uri=http%3A%2F%2Flocalhost%3A52237%2F&scope=https%3A%2F%2Fwww.googleapi
s.com%2Fauth%2Fspreadsheets&state=1KARiQPrFvVE2DcvpaCG1RNX900sXL&access_type=offline
```


Sign in with Google
Choose an account
to continue to AmazonSentimentAnalysis
Ravi Yadav
Use another account
English (United Kingdom)
Help
Privacy
Terms


Sign in with Google
AmazonSentimentAnalysis wants access to your Google Account
When you allow this access, AmazonSentimentAnalysis will be able to
See, edit, create and delete all your Google Sheets spreadsheets. Learn more
Make sure that you trust AmazonSentimentAnalysis
Cancel
Continue
English (United Kingdom)
Help
Privacy
Terms




```
(arsa) E:\DS Course\Projects\amazon-review-sentiment-analysis\arsa>python backend.py
Please visit this URL to authorize this application: https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=103778578439 3-rfgv3pse5mo9p84j1p7vapk3e4lo5ivk.apps.googleusercontent.com&redirect_uri=http%3A%2F%2Flocalhost%3A52237%2F&scope=https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fspreadsheets&state=1KARiQPrFvVE2DcvpaCG1RNX900sXl&access_type=offline
<google.oauth2.credentials.Credentials object at 0x0000025730315D90>
[['Gadget Type', 'Gender', 'Language', 'Product Name', 'Opinion'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', "I had a great exp erience using this phone. It's affordable and works really well for everyday use. The only thing that could be better is the camera quality , but considering the low price, it's still a fantastic deal. If you're looking for a budget-friendly phone that gets the job done, this is a solid choice!"], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Excellent phone and excellent price I got it at 7500. Great phon e at this price'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Its an Ok-Ok phone at this price range. definately try it if u ha ve low budget.'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', "Okay for basic use, but it falls short in a few key areas. The cha rging speed is not as fast as expected, and the battery drains quicker than anticipated. The camera quality is average, not very impressive in low-light conditions. While performance is decent for casual usage, it lags during multitasking or when running heavier apps. Overall, it's good for light usage, but if you're looking for more efficiency, this may not be the best option."], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Just received my realme n61, very slim and light phone 👌nice phone considering price.'], ['Smartphone', 'Male', 'Eng lish', 'Realme Narzo N61', 'Using it for a month, so far so good and reliable!'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'I got this phone in sale under 6000 . I think its a good phone under 7000 and if you have no problem with its inability of 5g then you are go od to go. This phone is not for hardcore phone users who need performance'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Phone i s nice but delivery boy experience was very bad , for exchange good condition phone he asked for 500 Rs and put it in his pocket without me ntioning any issue in his remark'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Worth it product for the price . Build quality i s really good . Also battery is very good'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Great performance and quality build.wor th it.'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Product is nice in that budget but when I take camera it takes slowly. Any way when compare to price it is suitable.'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Product is good.. features must be upg raded..charging is very slow 10 watt charger...screen guard is missing in the box .. every thing is good worth of money..go through it..'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Loud speaker making noise on call'], ['Smartphone', 'Male', 'English', 'Realme Narz o N61', 'Mobile is good but need 5g for better rating'], ['Smartphone', 'Male', 'English', 'POCO C61', "it is very laggy and the ads are a pain to deal with so don't take the 4 gb ram the os it self is buggy and it has no light sensor 😑 it uses the camera the camera bezel is j ust stupid , then why buy it idk my dad wanted it because it's cheap thats , buy the samsung m05 it the same price much cheaper around 6500 and has a nice camera and no bezel b.s and cools clean and good os 😂"], ['Smartphone', 'Male', 'Hindi', 'POCO C61', 'Price ke hisab se ka fi badhiya phone hai'], ['Smartphone', 'Male', 'English', 'POCO C61', 'Performance average but camer superb'], ['Smartphone', 'Male', 'Hind i', 'POCO C61', 'Display pe line mark aa raha h .... return policy ke andar hi problem aaya uske baad'], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', "It is good phone in this price range. It can do basic task with ease. - Build quality is good. - Phone screen is huge( I am not big fan of huge screens though). - Supports all basic functions with some casual gaming. - Filled with many pre installed apps. - Don't expect too much with camera. - Sound is loud enough. - Charging take 90-120 mins. - Fingerprint sensor is less sensitive (my view) - Heats while charging and Gaming. I think purpose of this phone is for day to day calling with smartphone features of internet browsing, pay ments, YouTube, etc. It does well in that area."], ['Smartphone', 'Male', 'English', 'Realme Narzo N61', 'Phone scores in all area. Must bu y if you are looking for budget phone'], ['Smartphone', 'Male', 'English', 'POCO C61', 'Value for money'], ['Smartphone', 'Male', 'English' , 'POCO C61', 'Bought for my grand parent, a steal if u buy just to watch YouTube and call, it has the biggest screen and best battery'], [ 'Smartphone', 'Male', 'English', 'POCO C61', "Don't buy this phone,Worst battery in the poco phone."], ['Smartphone', 'Male', 'Hindi', 'POC O C61', 'Ye phone maine bhi amazon se liya, itna bekar phone aajtak maine nahi dekha kahin, isme network he nahi rahata, itna bad feel karw
```

4. Representing data in Data frame
    - Install pandas package using command:

```
pip install pandas
```

    - Code for representing data in dataframes.

```python
from google_auth_oauthlib.flow import InstalledAppFlow
from googleapiclient.discovery import build
import pandas as pd

# Getting Permissions
f=InstalledAppFlow.from_client_secrets_file("key.json", ["https://www.googleapis.com/auth/spreadsheets"])
creds=f.run_local_server(port=0)
print(creds)
service=build("sheets","v4", credentials=creds).spreadsheets().values()
d=service.get(spreadsheetId="1u3l2eyMCQEgUahI13YxyqSVO8PFPQS1XVHlCV_-45mM",range="B:F").execute()
data=d['values']

# Getting first 5 datapoints from dataframe
df=pd.DataFrame(data[1:], columns=data[0])
print(df.head())

# Getting Opinion columns only
for reviews in df.loc[:5,'Opinion']:
    print(reviews)
```

```
(arsa) E:\DS Course\Projects\amazon-review-sentiment-analysis\arsa>python backend.py
Please visit this URL to authorize this application: https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=1037785784393-r
fgv3pse5mo9p8tj1p7vapk3e4lo5ivk.apps.googleusercontent.com&redirect_uri=http%3A%2F%2Flocalhost%3A50490%2F&scope=https%3A%2F%2Fwww.googleapi
s.com%2Fauth%2Fspreadsheets&state=R2a9JHzpD8AZEdLrBI7Qfi8BGzRQFu&access_type=offline
<google.oauth2.credentials.Credentials object at 0x00000221D8520E90>
  Gadget Type Gender Language      Product Name                                                Opinion
0  Smartphone   Male  English  Realme Narzo N61  I had a great experience using this phone. It'...
1  Smartphone   Male  English  Realme Narzo N61  Excellent phone and excellent price I got it a...
2  Smartphone   Male  English  Realme Narzo N61  Its an Ok-Ok phone at this price range. defina...
3  Smartphone   Male  English  Realme Narzo N61  Okay for basic use, but it falls short in a fe...
4  Smartphone   Male  English  Realme Narzo N61  Just received my realme n61, very slim and lig...
I had a great experience using this phone. It's affordable and works really well for everyday use. The only thing that could be better is t
he camera quality, but considering the low price, it's still a fantastic deal. If you're looking for a budget-friendly phone that gets the
job done, this is a solid choice!
Excellent phone and excellent price I got it at 7500. Great phone at this price
Its an Ok-Ok phone at this price range. definately try it if u have low budget.
Okay for basic use, but it falls short in a few key areas. The charging speed is not as fast as expected, and the battery drains quicker th
an anticipated. The camera quality is average, not very impressive in low-light conditions. While performance is decent for casual usage, i
t lags during multitasking or when running heavier apps. Overall, it's good for light usage, but if you're looking for more efficiency, thi
s may not be the best option.
Just received my realme n61, very slim and light phone 👌nice phone considering price.
Using it for a month, so far so good and reliable!
```

Sentiment Analysis

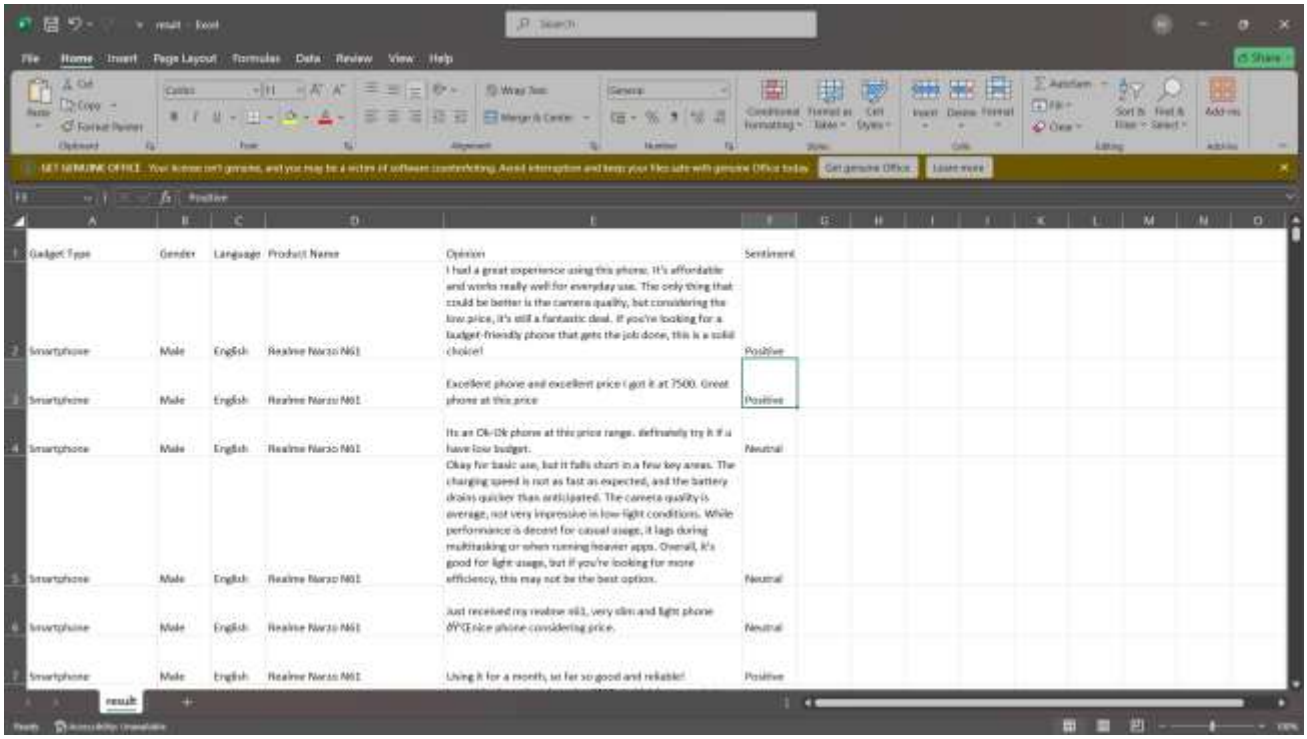
1. Install the following packages:

```
pip install vadersentiment nltk
```

2. Code for sentiment analysis and saving the data frame into a CSV file.

backend.py

```python
from google_auth_oauthlib.flow import InstalledAppFlow
from googleapiclient.discovery import build
import pandas as pd
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

# Getting Permissions
f=InstalledAppFlow.from_client_secrets_file("key.json", ["https://www.googleapis.com/auth/spreadsheets"])
creds=f.run_local_server(port=0)
print(creds)
service=build("sheets","v4", credentials=creds).spreadsheets().values()
d=service.get(spreadsheetId="1u3l2eyMCQEgUahI13YxyqSVOBPFPQSIXVHlCV_-45mM",range="B:F").execute()
data=d['values']

# Getting first 5 datapoints from dataframe
df=pd.DataFrame(data[1:], columns=data[0])
print(df.head())

mymodel=SentimentIntensityAnalyzer()
sentiment=[]

# Getting Opinion columns only
for reviews in df.loc[:,'Opinion']:
    pred=mymodel.polarity_scores(reviews)
    if pred['compound']>=0.5:
        sentiment.append("Positive")
    elif pred['compound']<0.5 and pred['compound']>=-0.5:
        sentiment.append("Neutral")
    else:
        sentiment.append("Negative")

# Adding prediction to dataframe as sentiment feature.
df['Sentiment']=sentiment
# Saving CSV file
df.to_csv("./data/result.csv",index=False)
```



Gadget Type	Gender	Language	Product Name	Opinion	Sentiment
Smartphone	Male	English	Realme Narzo N61	I had a great experience using this phone. It's affordable and works really well for everyday use. The only thing that could be better is the camera quality, but considering the low price, it's still a fantastic deal. If you're looking for a budget-friendly phone that gets the job done, this is a solid choice!	Positive
Smartphone	Male	English	Realme Narzo N61	Excellent phone and excellent price i got it at 7500. Great phone at this price	Positive
Smartphone	Male	English	Realme Narzo N61	Its an Ok-Ok phone at this price range. definately try it if u have low budget.	Neutral
Smartphone	Male	English	Realme Narzo N61	Okay for basic use, but it falls short in a few key areas. The charging speed is not as fast as expected, and the battery drains quicker than anticipated. The camera quality is average, not very impressive in low-light conditions. While performance is decent for casual usage, it lags during multitasking or when running heavier apps. Overall, it's good for light usage, but if you're looking for more efficiency, this may not be the best option.	Neutral
Smartphone	Male	English	Realme Narzo N61	Just received my realme n61, very slim and light phone ðŸ‘Œnice phone considering price.	Neutral
Smartphone	Male	English	Realme Narzo N61	Using it for a month, so far so good and reliable!	Positive

Data Visualization

1. Installing plotly package.

```
pip install plotly
```

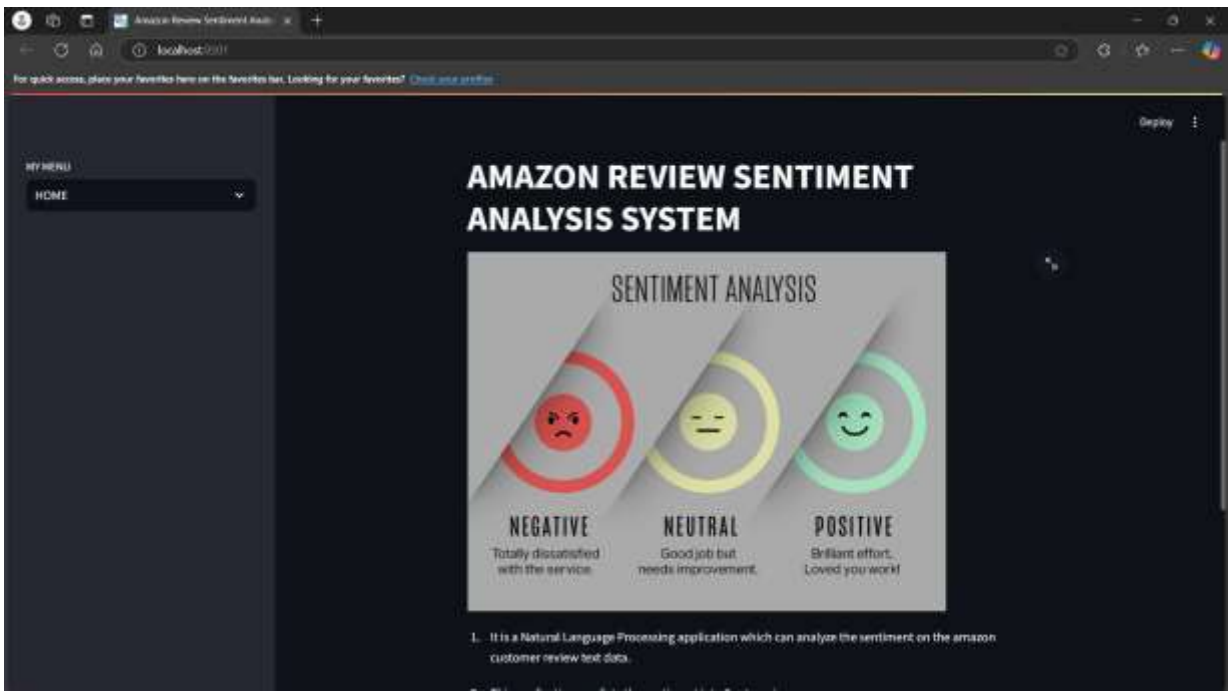
Creating Frontend

1. Install streamlit package.

```
pip install streamlit
```

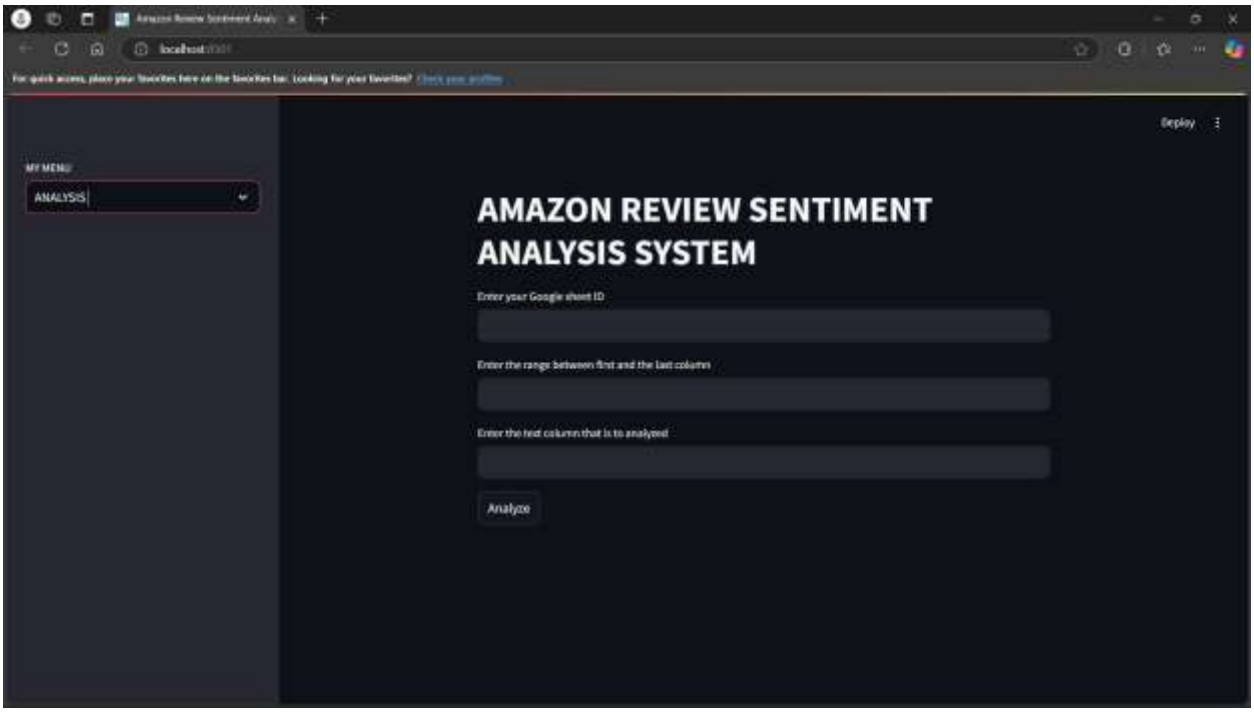
2. Creating frontend application in main.py file.

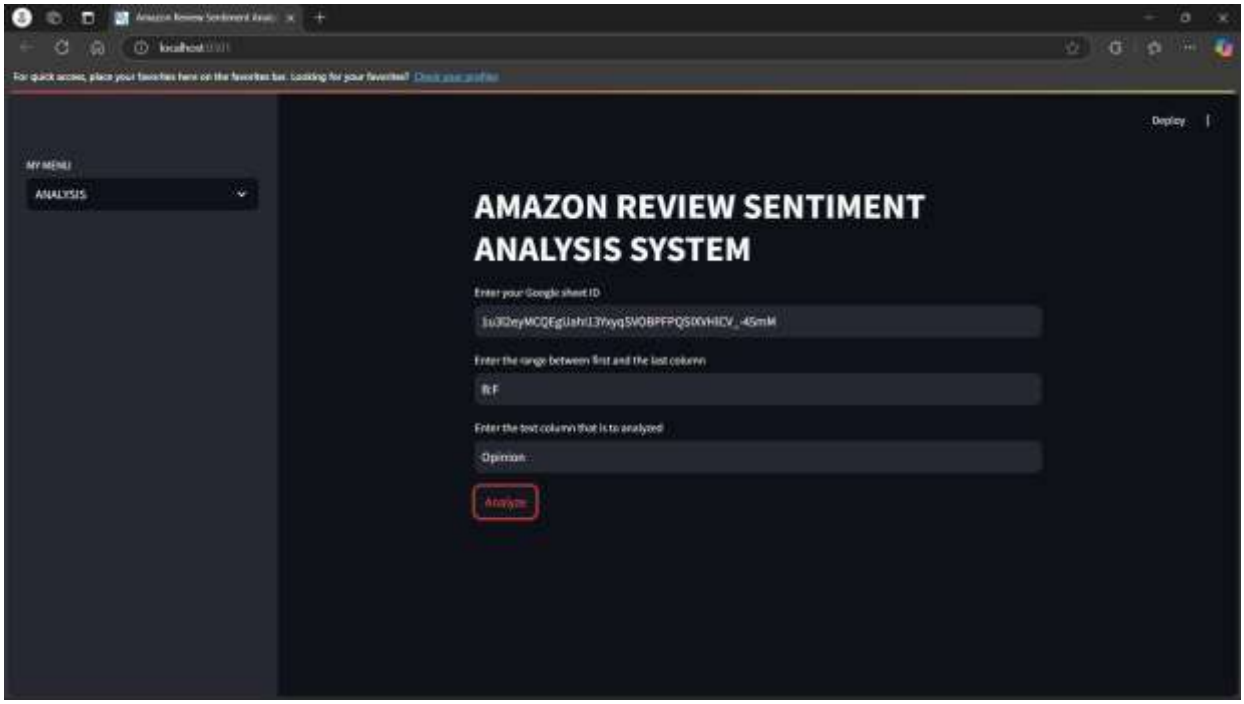
```python
from google_auth_oauthlib.flow import InstalledAppFlow
from googleapiclient.discovery import build
import pandas as pd
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer
import streamlit as st

st.set_page_config("Amazon Review Sentiment Analysis System",page_icon='https://static.vecteezy.com/system/resources/previews/0.
st.title("AMAZON REVIEW SENTIMENT ANALYSIS SYSTEM")
choice=st.sidebar.selectbox("MY MENU",("HOME", "ANALYSIS", "RESULT"))

if choice=="HOME":
    st.image("https://camo.githubusercontent.com/af6d1852b5fad2894cacc29678363df035d3c6005a3364ac33cb5181b6b65d7f/68747470733a2
    width=600)
    st.write("1.    It is a Natural Language Processing application which can analyze the sentiment on the amazon customer revi
    st.write("""2.  This application predicts the sentiment into 3 categories:\n
    a.  Positive\n
    b.  Negative\n
    c.  Neutral
        """)
    st.write("3.    This application can get the data through a google sheet.")
```

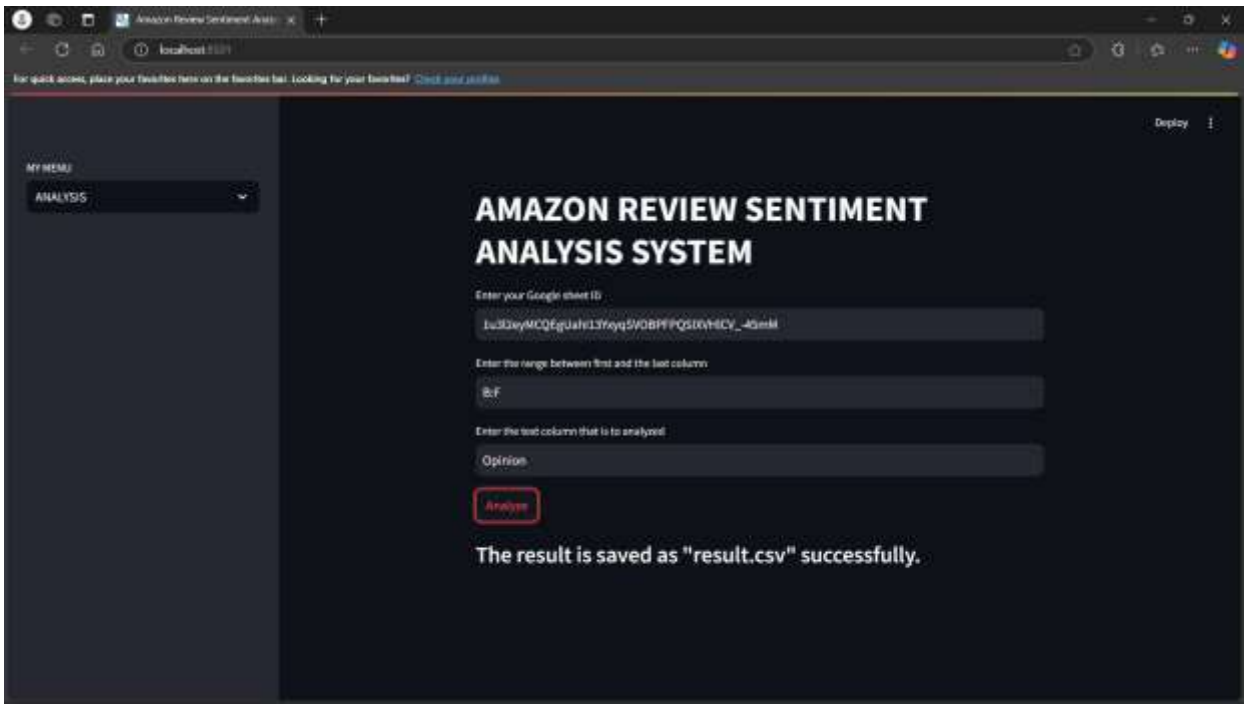


- Analyze page

```python
elif choice=="ANALYSIS":
    sid=st.text_input("Enter your Google sheet ID")
    r=st.text_input("Enter the range between first and the last column")
    c=st.text_input("Enter the text column that is to 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(d[1:],columns=d[0])
        l=[]
        for i in range(df.shape[0]):
            t=df._get_value(i,c)
            pred=mymodel.polarity_scores(t)

            if pred["compound"]>0.5:
                l.append("Positive")
            elif pred['compound']<0.5 and pred['compound']>-0.5:
                l.append("Neutral")
            else:
                l.append("Negative")

        df['Sentiment']=l
        df.to_csv("./data/result.csv",index=False)
        st.subheader("The result is saved as \"result.csv\" successfully.")
```

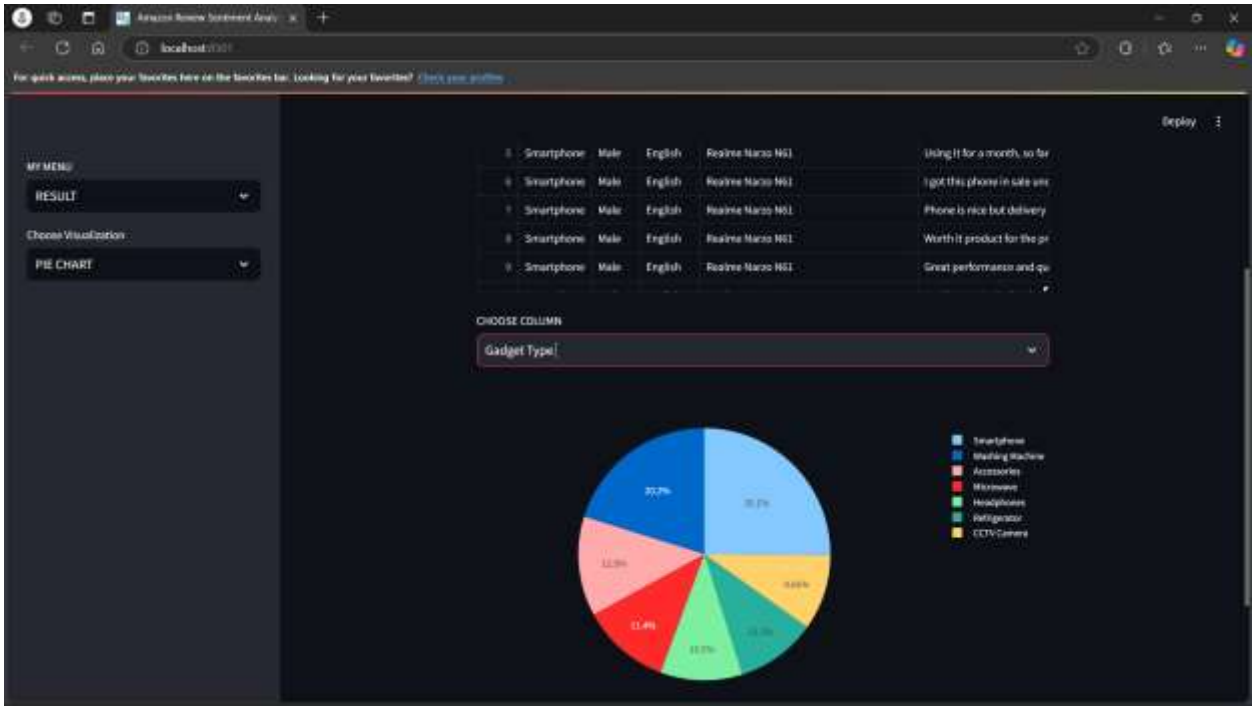


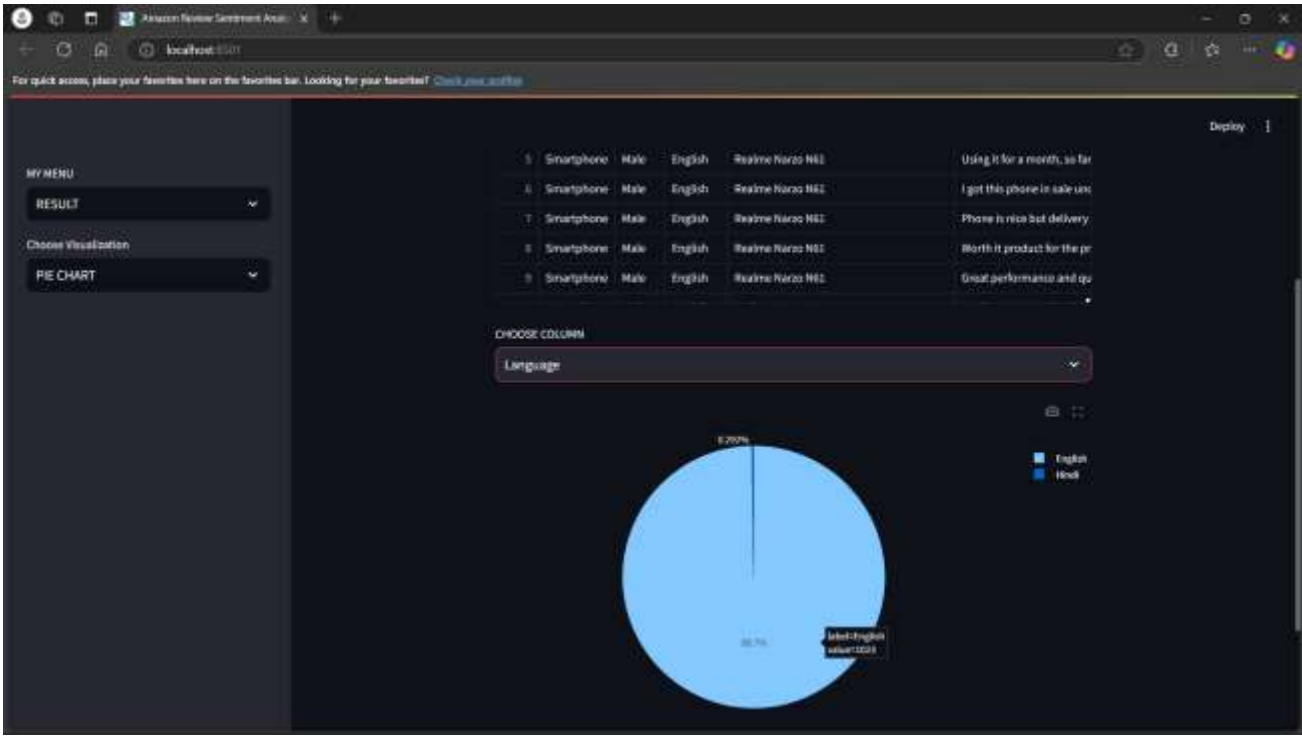

MY MENU
ANALYSIS
Deploy
AMAZON REVIEW SENTIMENT ANALYSIS SYSTEM
Enter your Google sheet ID
Enter the range between first and the last column
B:F
Enter the text column that is to analyzed
Opinion
Analyze

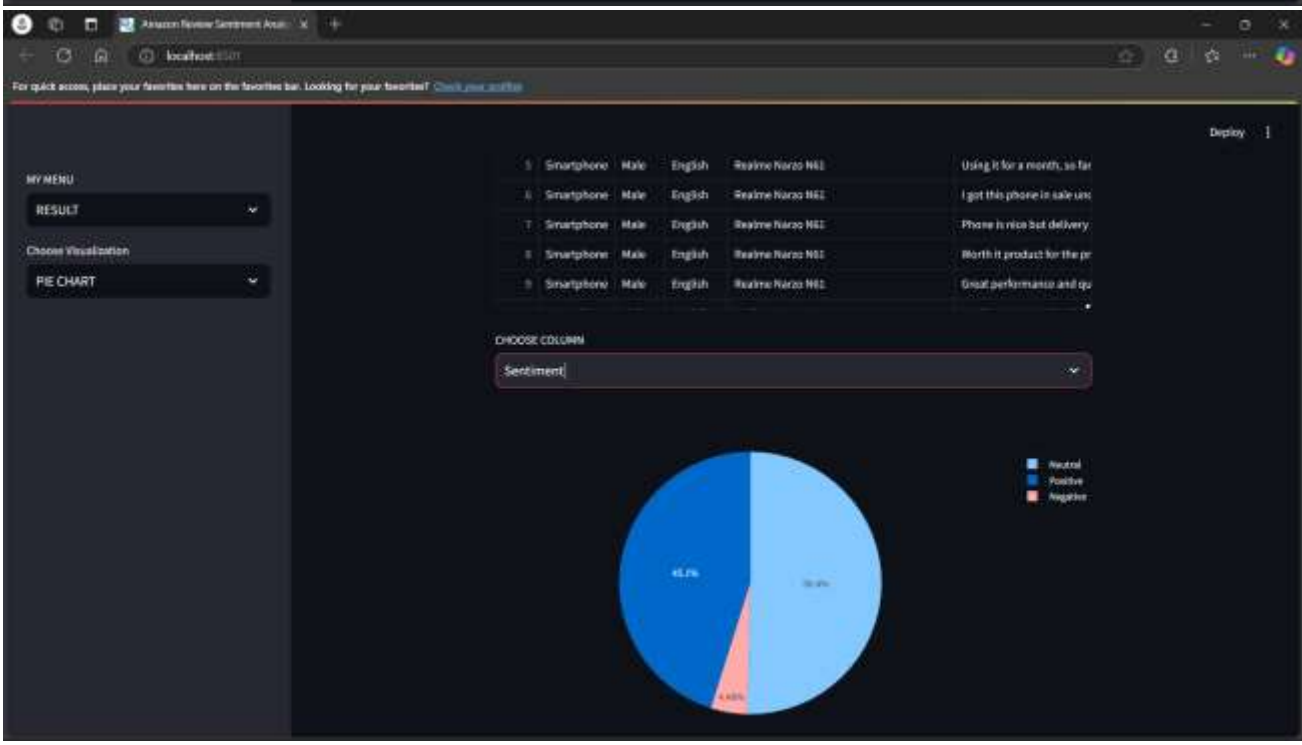

MY MENU
ANALYSIS
Deploy
AMAZON REVIEW SENTIMENT ANALYSIS SYSTEM
Enter your Google sheet ID
Enter the range between first and the last column
B:F
Enter the text column that is to analyzed
Opinion
Analyze
The result is saved as "result.csv" successfully.

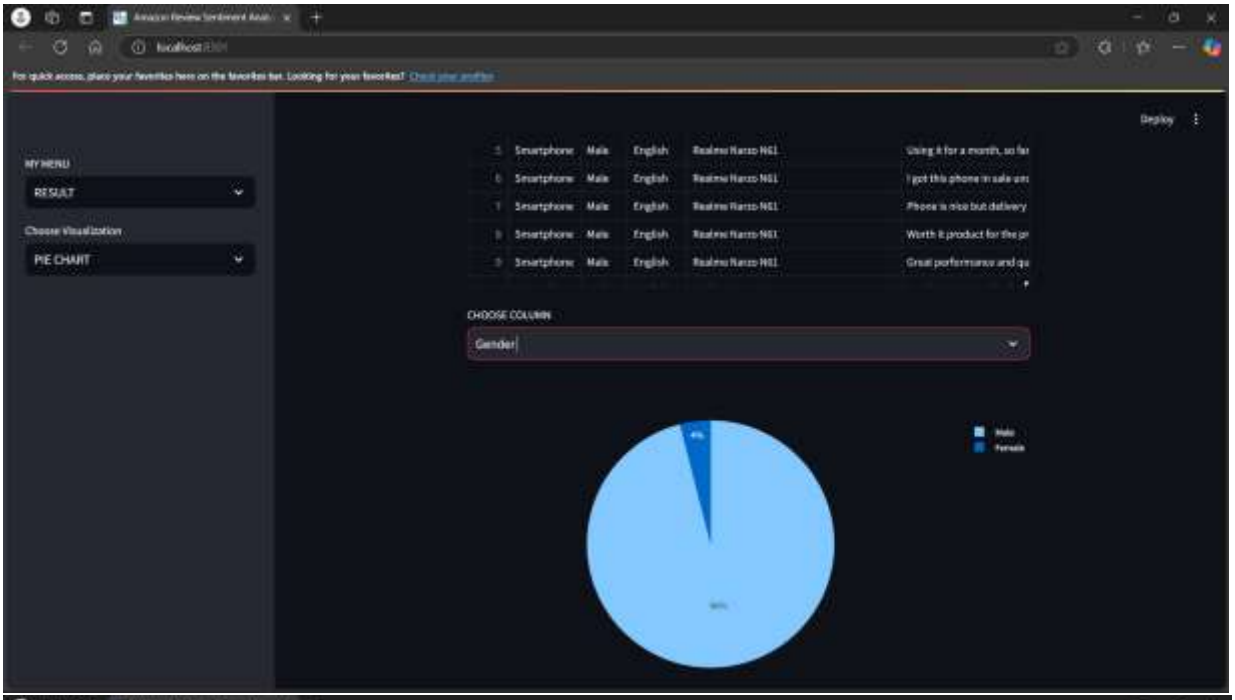
- Result page

```
else:
    df=pd.read_csv("./data/result.csv")
    choice2=st.sidebar.selectbox("Choose Visualization",("NONE","PIE CHART", "HISTOGRAM", "SCATTERPLOT"))
    st.dataframe(df)
    if choice2=="PIE CHART":
        k=st.selectbox("CHOOSE COLUMN",("None","Gadget Type", "Gender","Language", "Sentiment"))
        if k=="Gadget Type":
                freq=(df['Gadget Type'].value_counts().to_list())
                label=df['Gadget Type'].value_counts().index
                fig=px.pie(values=freq,names=label)
                st.plotly_chart(fig)
        elif k=="Gender":
                freq=(df['Gender'].value_counts().to_list())
                label=df['Gender'].value_counts().index
                fig=px.pie(values=freq,names=label)
                st.plotly_chart(fig)
        elif k=="Language":
                freq=(df['Language'].value_counts().to_list())
                label=df['Language'].value_counts().index
                fig=px.pie(values=freq,names=label,)
                st.plotly_chart(fig)
        elif k=="Sentiment":
                freq=(df['Sentiment'].value_counts().to_list())
                label=df['Sentiment'].value_counts().index
                fig=px.pie(values=freq,names=label,)
                st.plotly_chart(fig)
        else:
                pass

    elif choice2=="HISTOGRAM":
        k=st.selectbox("CHOOSE COLUMN",("None","Gadget Type", "Gender","Language"))
        if k!='None':
            fig=px.histogram(df,x=k,color=df['Sentiment'])
            st.plotly_chart(fig)

    elif choice2=="SCATTERPLOT":
        k=st.selectbox("CHOOSE NUMERIC VALUE COLUMN",("None", "Gadget Type","Gender","Language"))
        if k!="None":
                try:
                        fig=px.scatter(df,x=k,y="Sentiment")
                        st.plotly_chart(fig)
                except Exception as e:
                        st.write("Please try with a Numeric Column")
                        st.rerun()
```

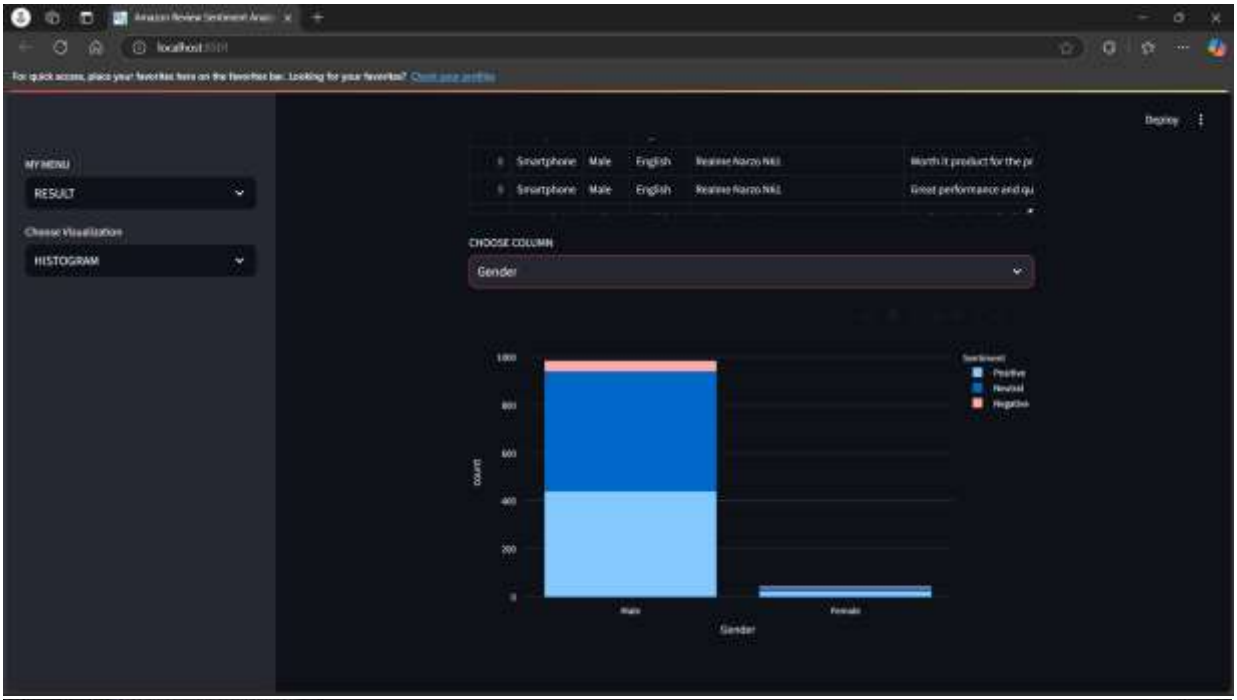

MY MENU
RESULT
Choose Visualization
PIE CHART
Deploy
Smartphone Male English Realme Narzo N61 Using it for a month, so far
Smartphone Male English Realme Narzo N61 I got this phone in sale ons
Smartphone Male English Realme Narzo N61 Phone is nice but delivery
Smartphone Male English Realme Narzo N61 Worth it product for the pr
Smartphone Male English Realme Narzo N61 Great performance and qu
CHOOSE COLUMN
Gadget Type
Smartphone
Washing Machine
Accessories
Microwave
Headphones
Refrigerator
CCTV Camera

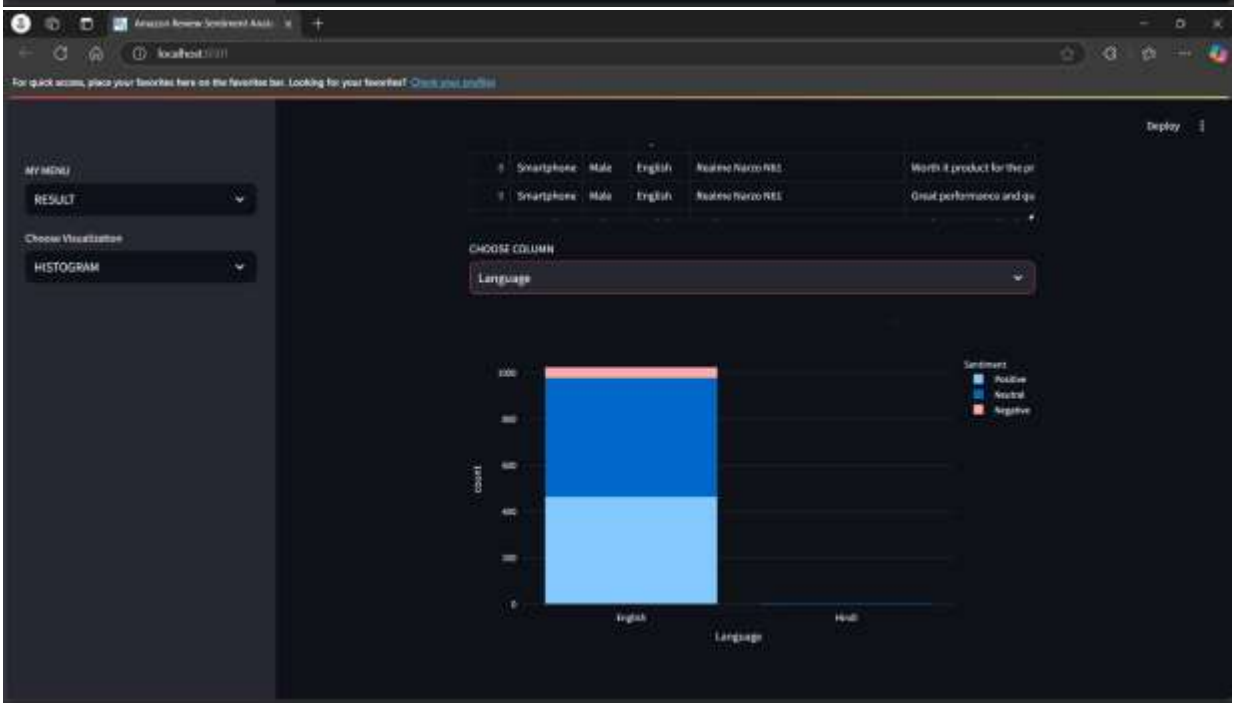

MY MENU
RESULT
Choose Visualization
PIE CHART
Deploy
CHOOSE COLUMN
Language
English
Hindi

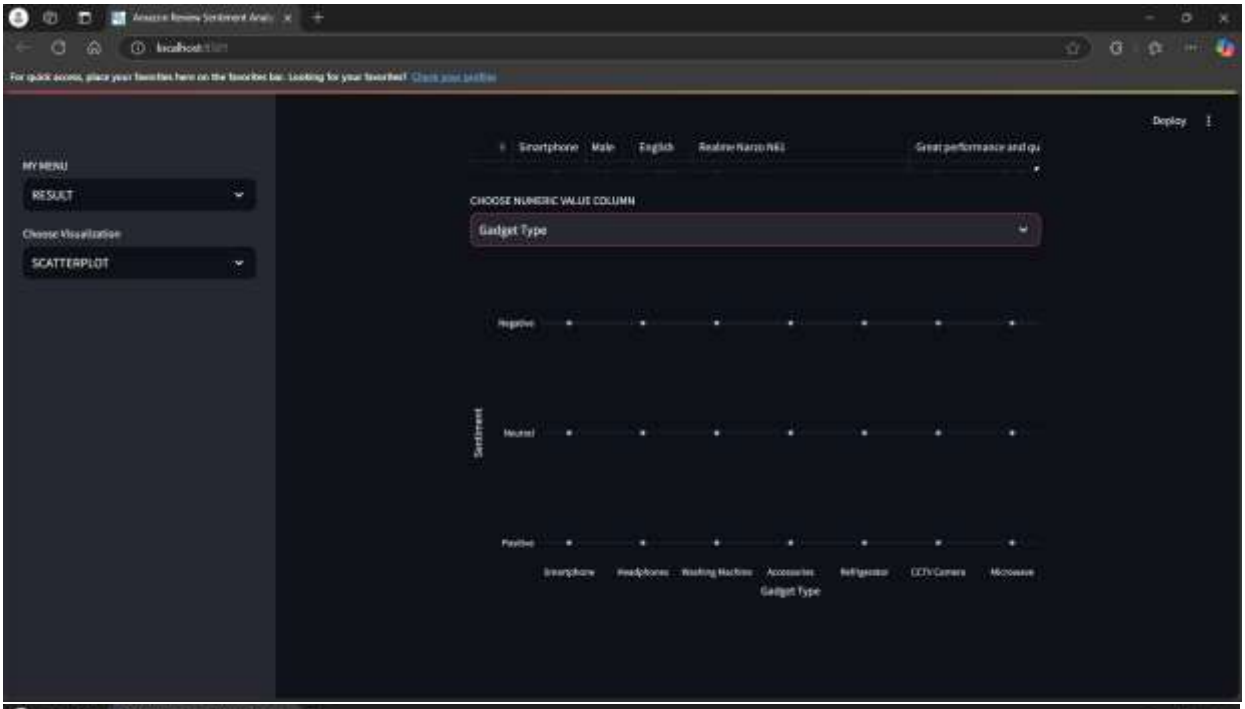

MY MENU
RESULT
Choose Visualization
PIE CHART
Deploy
CHOOSE COLUMN
Sentiment
Neutral
Positive
Negative

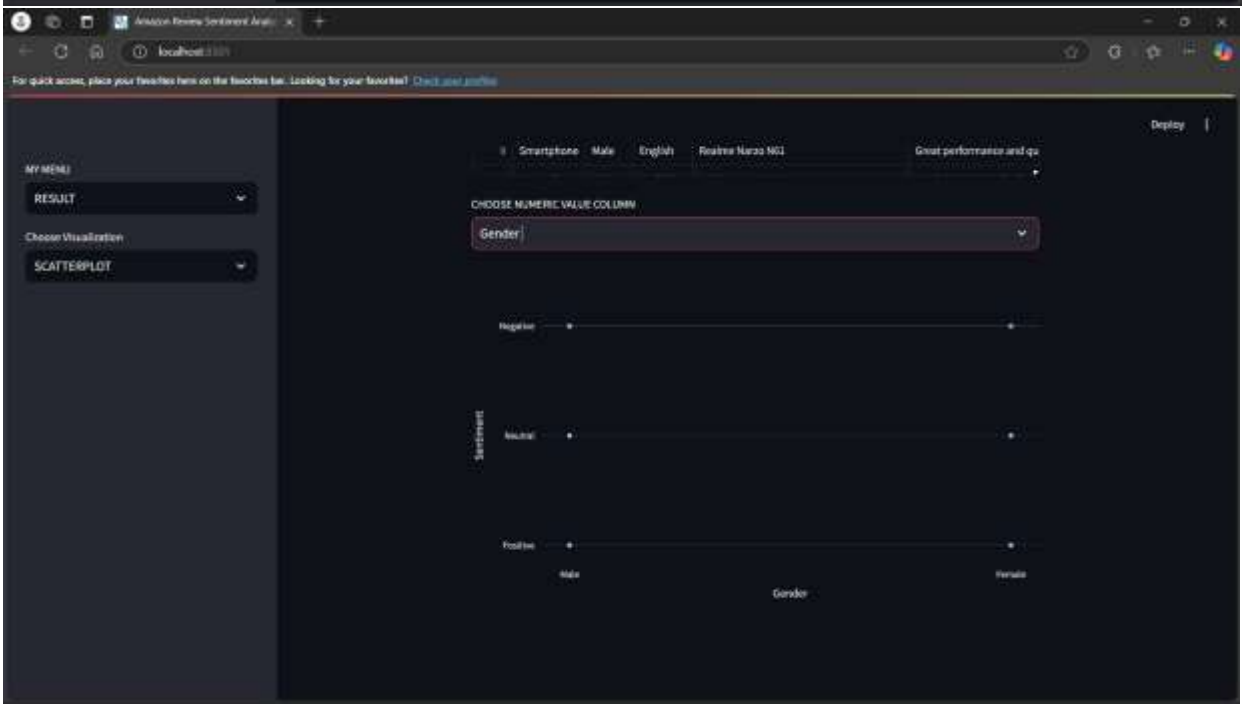

MY MENU
RESULT
Choose Visualization
PIE CHART
Deploy
CHOOSE COLUMN
Gender
Male
Female

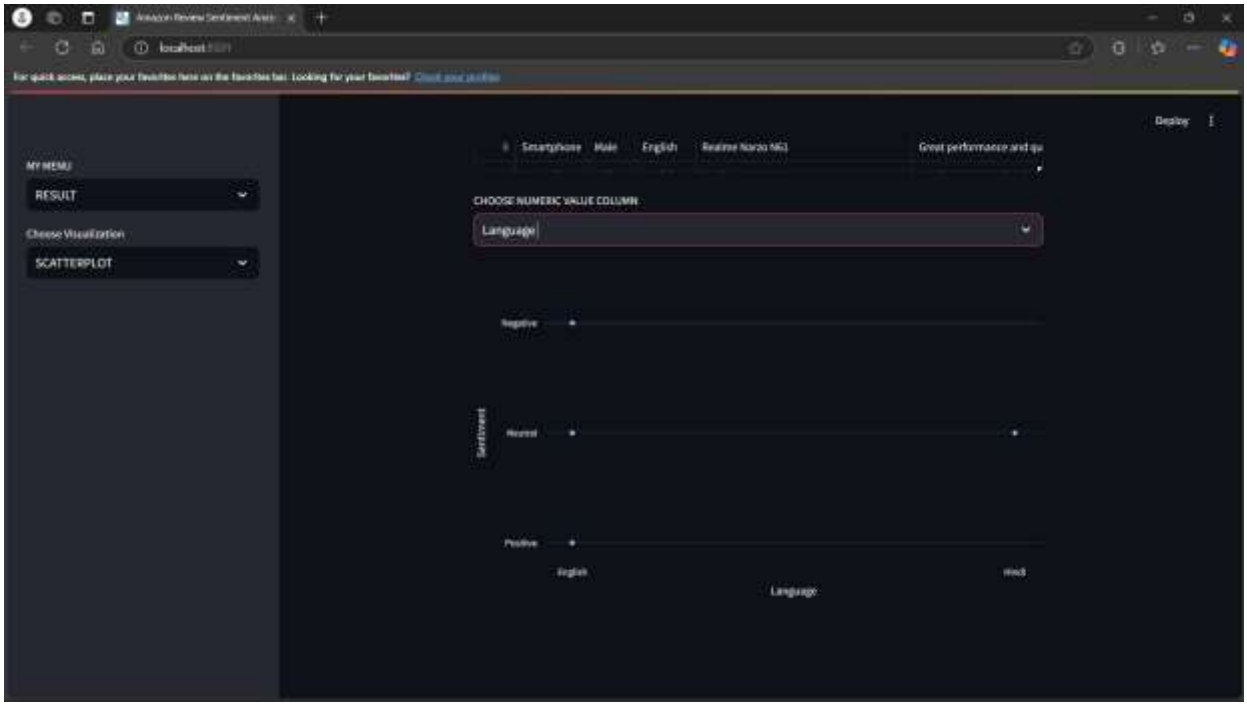

MY MENU
RESULT
Choose Visualization
HISTOGRAM
Deploy
CHOOSE COLUMN
Gadget Type
Sentiment
Positive
Neutral
Negative
count
Gadget Type


MY MENU
RESULT
Choose Visualization
HISTOGRAM
Deploy
Smartphone Male English Realme Narzo N61 Worth it product for the pr
Smartphone Male English Realme Narzo N61 Great performance and qu
CHOOSE COLUMN
Gender
Sentiment
Positive
Neutral
Negative
count
Male
Female
Gender


MY MENU
RESULT
Choose Visualization
HISTOGRAM
Deploy
Smartphone Male English Realme Narzo N61 Worth it product for the pr
Smartphone Male English Realme Narzo N61 Great performance and qu
CHOOSE COLUMN
Language
Sentiment
Positive
Neutral
Negative
count
English
Hindi
Language


Deploy
Smartphone Male English Realme Narzo N61 Great performance and qu
MY MENU
RESULT
Choose Visualization
SCATTERPLOT
CHOOSE NUMERIC VALUE COLUMN
Gadget Type
Negative
Neutral
Positive
Sentiment
Smartphone
Headphones
Washing Machine
Accessories
Refrigerator
CCTV Camera
Microwave
Gadget Type


Deploy
Smartphone Male English Realme Narzo N61 Great performance and qu
MY MENU
RESULT
Choose Visualization
SCATTERPLOT
CHOOSE NUMERIC VALUE COLUMN
Gender
Negative
Neutral
Positive
Sentiment
Male
Female
Gender


MY MENU
RESULT
Choose Visualization
SCATTERPLOT
Deploy
Smartphone Male English Realme Narzo N61 Great performance and qu
CHOOSE NUMERIC VALUE COLUMN
Language
Negative
Neutral
Positive
Sentiment
English
Hindi
Language