AMAZON KINDLE STORE REVIEWS ANALYSIS USING IBM WATSON SERVICES

AN INDUSTRY ORIENTED MINI REPORT

Submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

In partial fulfillment of the requirements for the award of the degree of

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IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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Bollikunta, Warangal –

506005 **2019– 2023**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINNERING

VAAGDEVI ENGINEERING COLLEGE

BOLLIKUNTA, WARANGAL – 506005

2019 – 2023

CERTIFICATE OF COMPLETION

INDUSTRY ORIENTED MINI PROJECT

This is to certify that the UG Project Phase-1 entitled "**AMAZON KINDLE STORE REVIEWS ANALYSIS USING IBM WATSON SERVICES**" Is being submitted by- ***GUDLA SRIYA(H.NO:19UK1A0518),MAMIDALAVAMSHI(H.NO:19UK1A0516),BOLL EPELLI RAMYA(H.NO:19UK1A0553),***in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology in Computer Science and Engineering to Jawaharlal Nehru Technological University Hyderabad during the academic year 2022-23, is a record of work carried out by them under the guidance and supervision.

Project Guide
Mr. A. ASHOK KUMAR
(Assistant Professor)

Head of the Department
Dr. R. NaveenKumar
(Professor)

External

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ABSTRACT

Amazon Kindle Store is an e-book e-commerce store for all the book reading hobbyists. Online reviews are a category of product information created by users based on personal handling experience. Online shopping websites endow with platforms for consumers to review products and carve up opinions. The problem is most of the comments from customer reviews about the products are contradicted to their ratings. Many customers will post their comments and forgot to rate the product or not engrossed to rate it.

Sentiment mining plays a very important role in business to understand the opinion of customers to improve the products. Customer also depends on the opinion of others who have bought the products already. Reviews or feedback becomes the deciding factor to buy or sell a product. A rating of the products gives a speedy clarification to pact with the product. We will be using Natural language processing to analyse the sentiment (positive or a negative) of the given review.

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1.INTRODUCTION

1.1.OVERVIEW

The objective of this paper is to categorize the positive and negative feedback of the customers over different products and build a supervised learning model to polarize large amounts of reviews. A study on amazon last year revealed more than 80% of online shoppers trust reviews as much as personal recommendations. Any online item with a large amount of positive reviews provides a powerful comment of the legitimacy of the item. Conversely, books, or any other online item, without reviews puts potential prospects in a state of distrust. Quite simply, more reviews look more convincing. People value the consent and experience of others and the review on a material is the only way to understand others' impression on the product. Opinions, collected from users' experiences regarding specific products or topics, straightforwardly influence future customer purchase decisions. Similarly, negative reviews often cause sales loss. For those understanding the feedback of customers and polarizing accordingly over a large amount of data is the goal. There are some similar works done over amazon dataset. In opinion mining over a small set of dataset of Amazon kindle product reviews to understand the polarized attitudes towards the product.

- Know fundamental concepts and techniques of natural language processing (NLP)
- Gain a broad understanding of text data.
- Know how to pre-process/clean the data using different text preprocessing techniques.
- Know how to build a neural network.
- Know how to build a web application using the Flask framework

1.2.PURPOSE

As the commercial sites of the world are almost fully online platforms, people are trading products through different e-commerce websites. And for that reason reviewing products before buying is also a common scenario. Also nowadays, customers are more inclined towards the reviews to buy a product. So analyzing the data from those customer reviews to make the data more dynamic is an essential field nowadays. In this age of increasing machine learning and deep learning based algorithms, reading thousands of reviews to understand a product is rather time consuming where we can polarize a review on a particular category to understand its popularity among the buyers all over

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

Given a dataset containing of various attributes,use the features available in dataset and define a supervised classification algorithm which can identify wether they getting reviews correct predicted reviews or not. The problem is most of the comments from customer reviews about the products are contradicted to their ratings. Many customers will post their comments and forgot to rate the product or not engrossed to rate it.

2.2 PROPOSED SOLLUTION

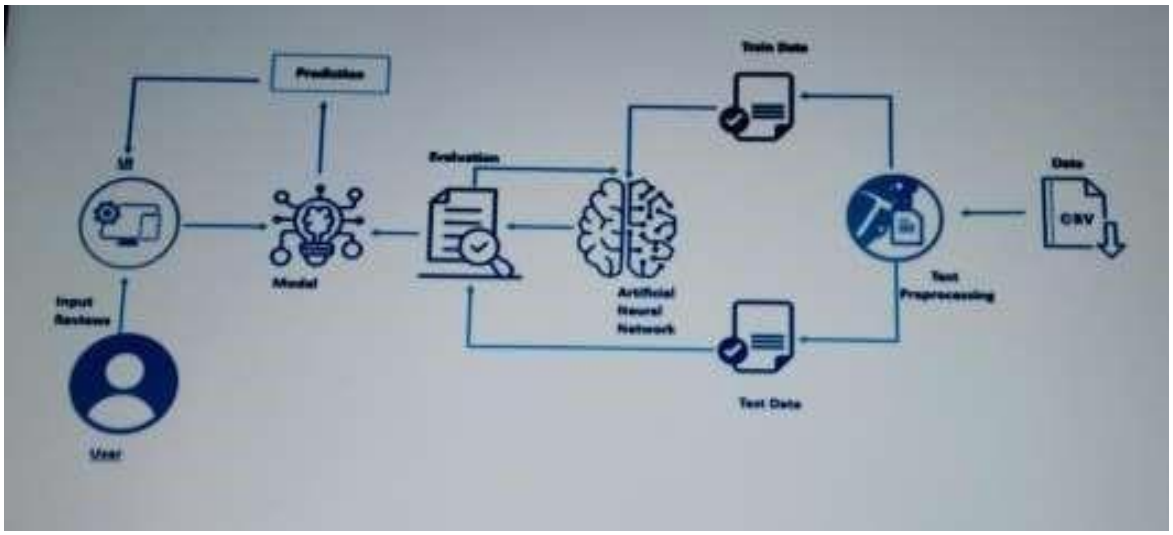
All Information in the world can be broadly classified into mainly two categories, facts and opinions. Factsare objective statements about entities and worldly events. On the other hand opinions are subjective statements that reflect people's sentiments or perceptions about the entities and events . Maximum amount of existing research on text and information processing is focused on mining and getting the factual information from the text or information. Before we had WWW we were lacking a collection of opinion data, in an individual needs to make a decision, he/she typically asks for opinions from friends and families. When an organization needs to find opinions of the general public about its products and services, it conducted surveys and focused groups. But after the growth of Web, especially with the drastic growth of the user generated content on the Web, the world has changed and so has the methods of gaining ones opinion. One can post reviews of products at merchant sites and express views on almost anything in Internet forums, discussion groups, and blogs, which are collectively called the user generated content . As the technology of connectivity grew so as the ways of interpreting and processing of users opinion information has changed. Some of the machine learning techniques like Naïve Bayes, Maximum Entropy and Support Vector Machines has been discussed in the paper . Extracting features from user opinion information is an emerging task.

1. Preparing Review Database
2. POS Tagging
3. Feature Extraction
4. Opinion Word Extraction
5. Opinion Word Polarity Identification
6. Opinion Sentences Polarity Identification
7. Summary Generation

a generic model of feature extraction from opinion information is shown, firstly the information database is created, next POS tagging is done on the review, next the features are extracted using grammar rules such as adjective + noun or so on, as nouns are features and adjectives are sentiment words. Next Opinion words are extracted followed by its polarity identification. Some models also calculate sentence polarity for accuracy. Lastly the results are combined to obtain a summary. Many algorithms can be used in opinion mining such as Naive Bayes Classification, Probabilistic Machine Learning approach to classify the reviews as positive or negative, have been used to get the sentiment of opinions of different domains such as movie, Amazon reviews of products. In our work we have used reviews of iPhone 5 extracted from Amazon website. We studied all the reviews and got to know that there are many reviews in which the user talks about the service provided by amazon and its sellers. So we decided to classify reviews into service, product and feature based reviews. We also found that the sentiment of each review is very obvious, the review rating provided by the user mirrors what the user writes as his/her review, i.e. if the user writes something bad definitely the overall rating the user gives is either 1 or 2 out of 5. This is from our study of a set of amazon reviews on iPhone 5. Our work mainly concentrates on feature extraction and finding out the sentiment of the particular feature. We have used POS tagging technique on sentence level. In our approach we have made certain rules using the tags of particular word and using list of words with respective sentiment value to find the feature and then getting the appropriate sentiment from it. The Sentiment model that we have proposed is designed based on the uncertainty of the amazon reviews. Our work also include summarization in the form of charts for overall view of the sentiments of the users on the product or a particular feature.

3.THEORITICAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 HARDWARE / SOFTWARE DESIGNING

The following is the Hardware required to complete this project:

● Internet connection to download and activate

● Administration access to install and run Anaconda Navigator

● Minimum 10GB free disk space

● Windows 8.1 or 10 (64-bit or 32-bit version) OR Cloud: Get started free, *Cloud account required.

Minimum System Requirements To run Office Excel 2013, your computer needs to meet the following minimum hardware requirements:

● 500 megahertz (MHz)
● 256 megabytes (MB) RAM

● 1.5 gigabytes (GB) available space

● 1024x768 or higher resolution monitor

The following are the software required for the project:

● Google Colaboratory Notebook and Jupyter Notebook

● Spyder and Pycharm Community

● Microsoft Excel 2013

4.EXPERIMENTAL INVESTIGATION

In this project, we have used Amazon Kindle Store Reviews Dataset.This dataset is a csv file consisting of labelled data and having the following coloumns-

“reviewerID”: D of the reviewer

“asin”: ID of the product

“reviewerName”: name of the reviewer

“helpful”: helpfulness rating of the review

“reviewText”: text of the review

“overall”: rating of the product

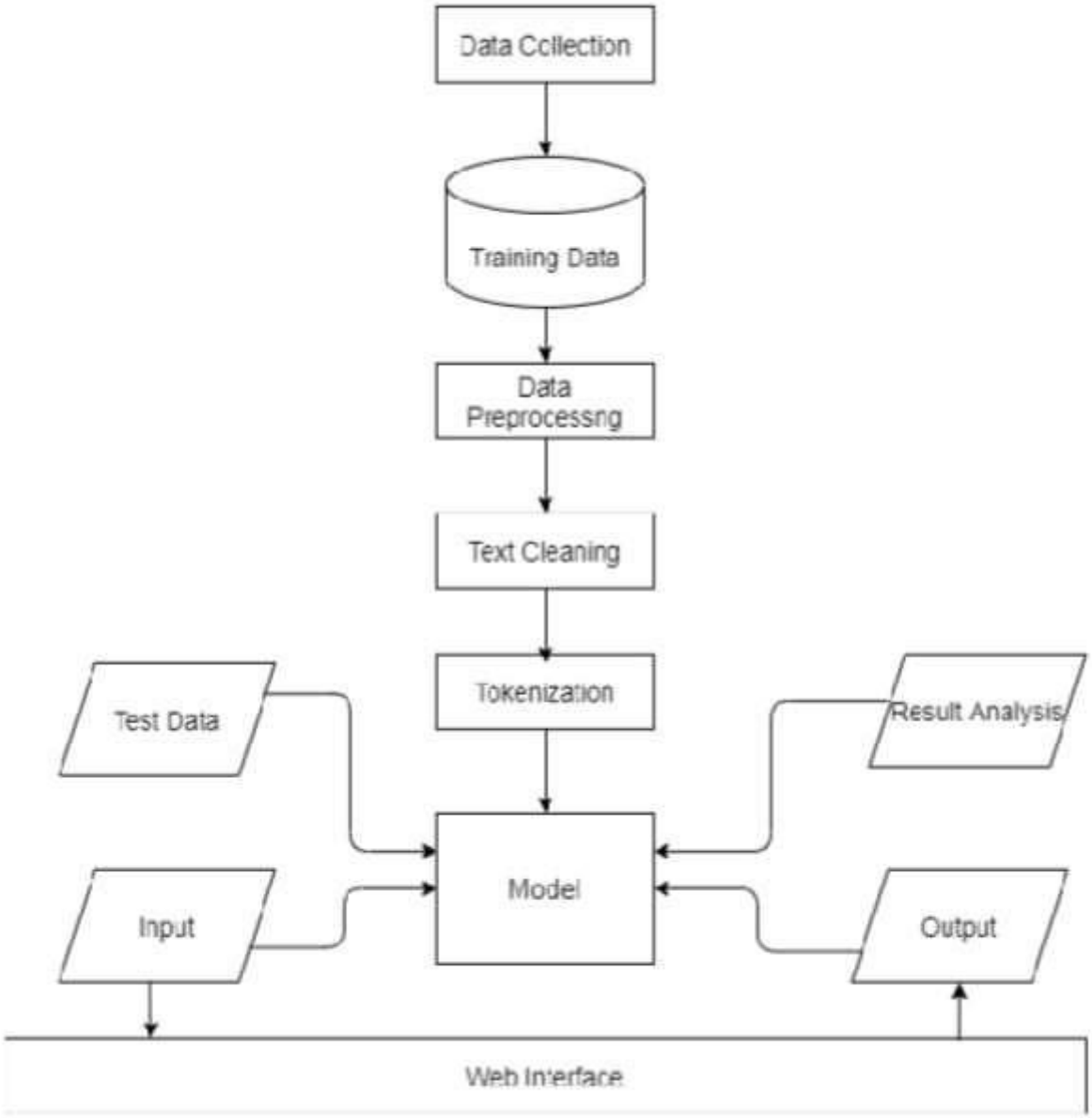
“summary”: summary of the review

“reviewTime”: time of the review

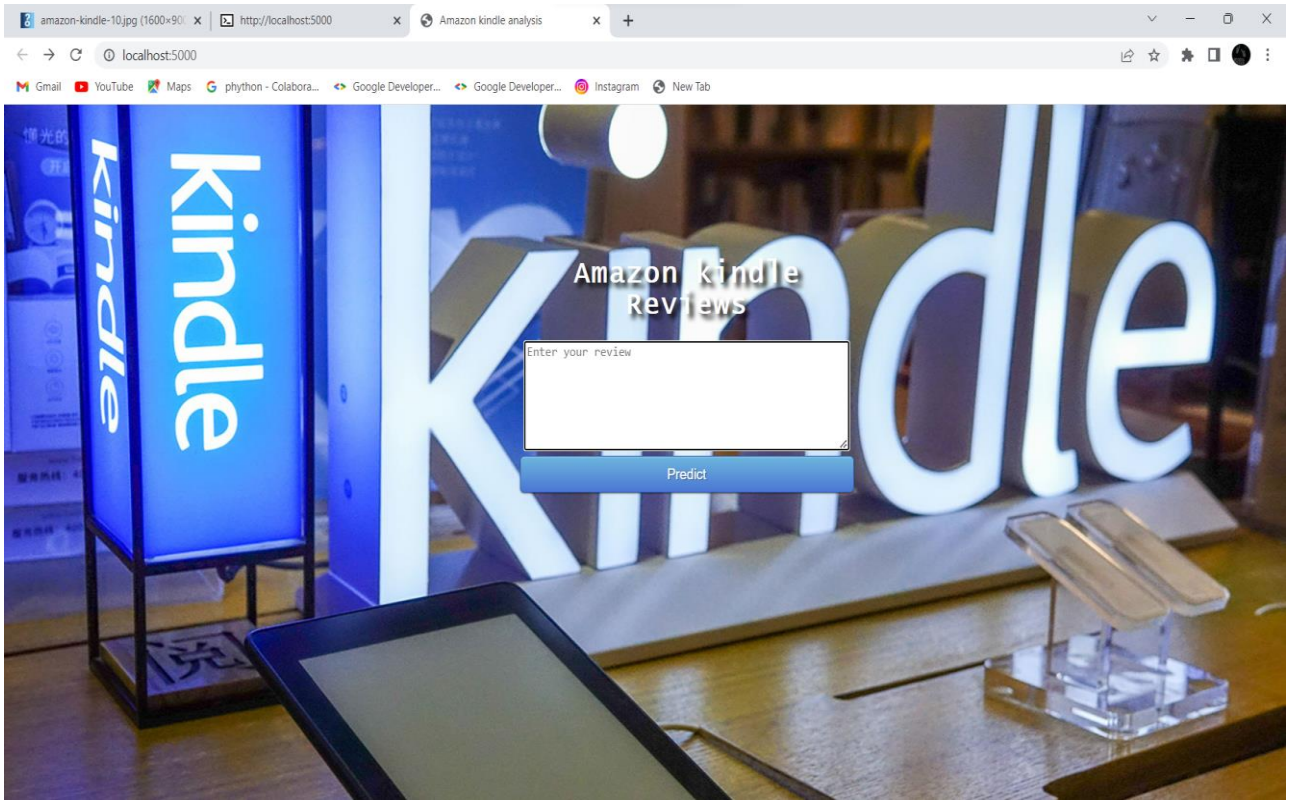
“unixreviewTime”: unix timestamp

For the dataset we selected, it consists of more than 50,000 kindle book reviews. From the format used analysing the review polarity we used review test & Overall from it.

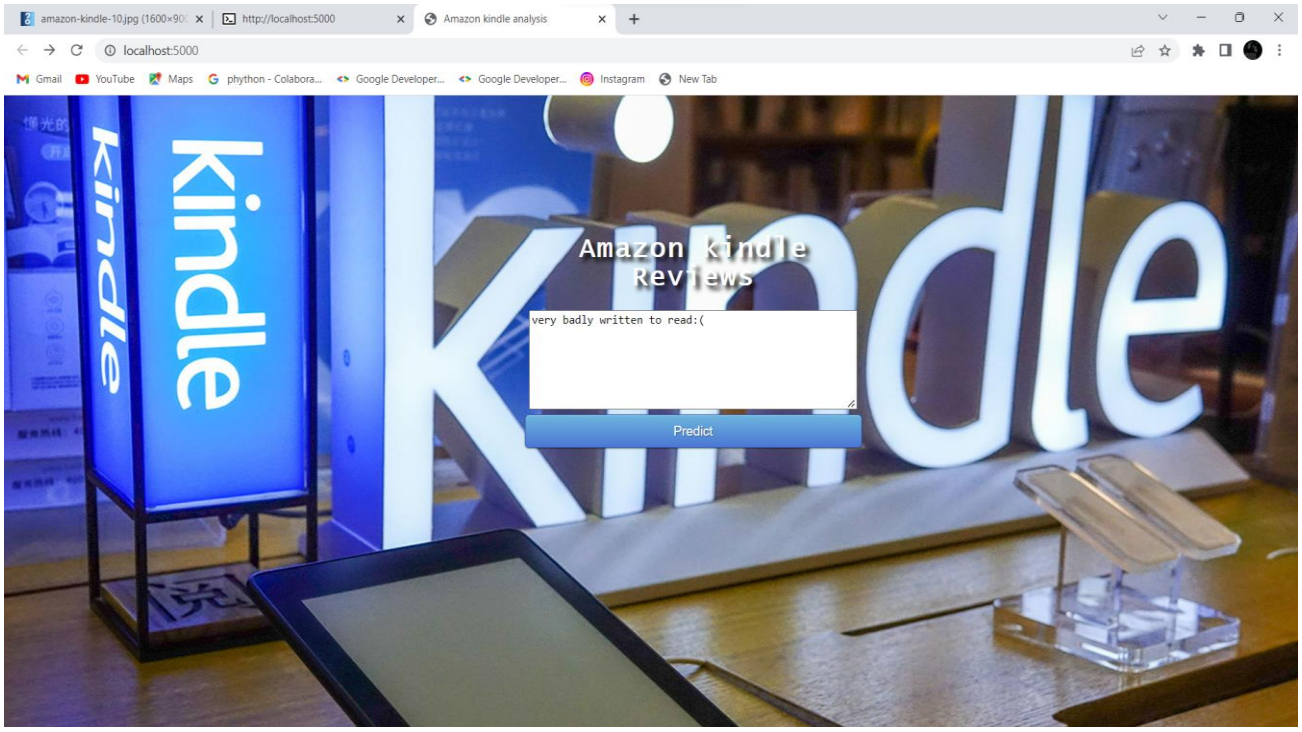
5.FLOWCHART


Data Collection
Training Data
Data Preprocessng
Text Cleaning
Tokenization
Test Data
Result Analysis
Model
Input
Output
Web Interface

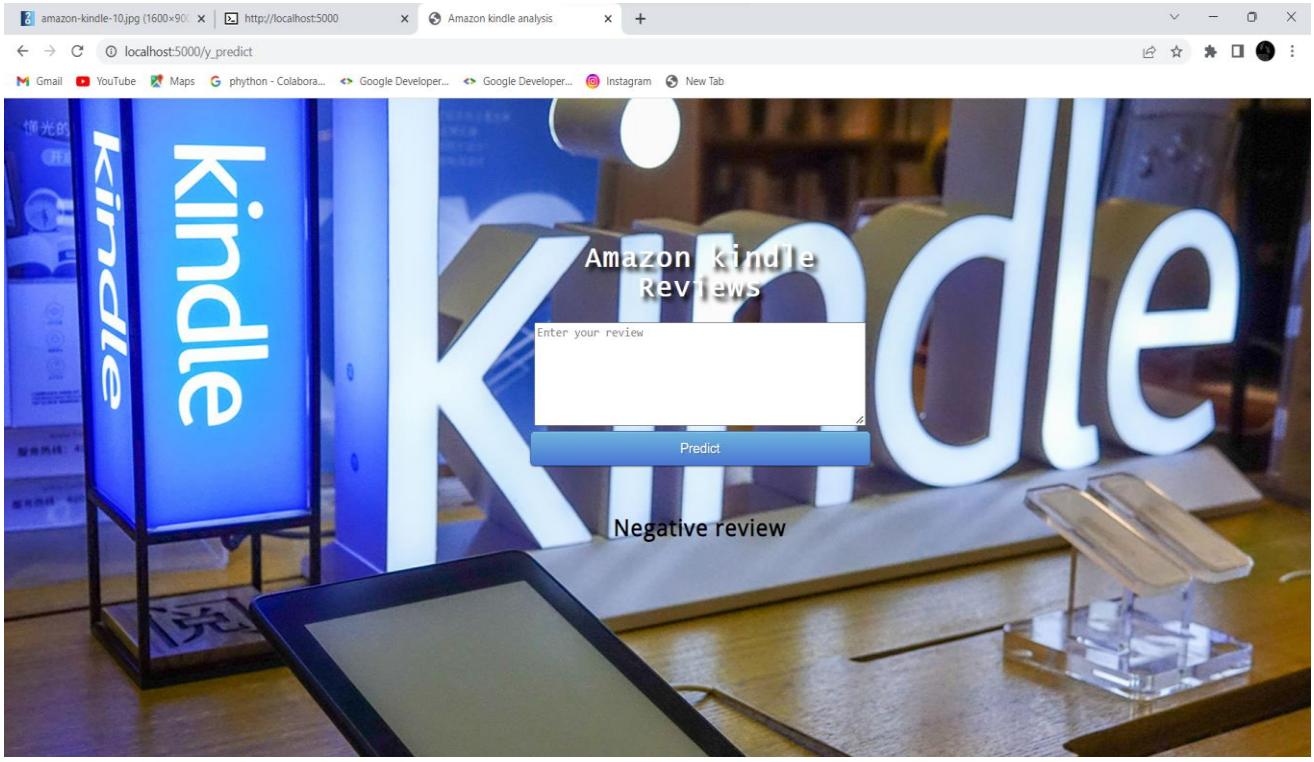
6.RESULT



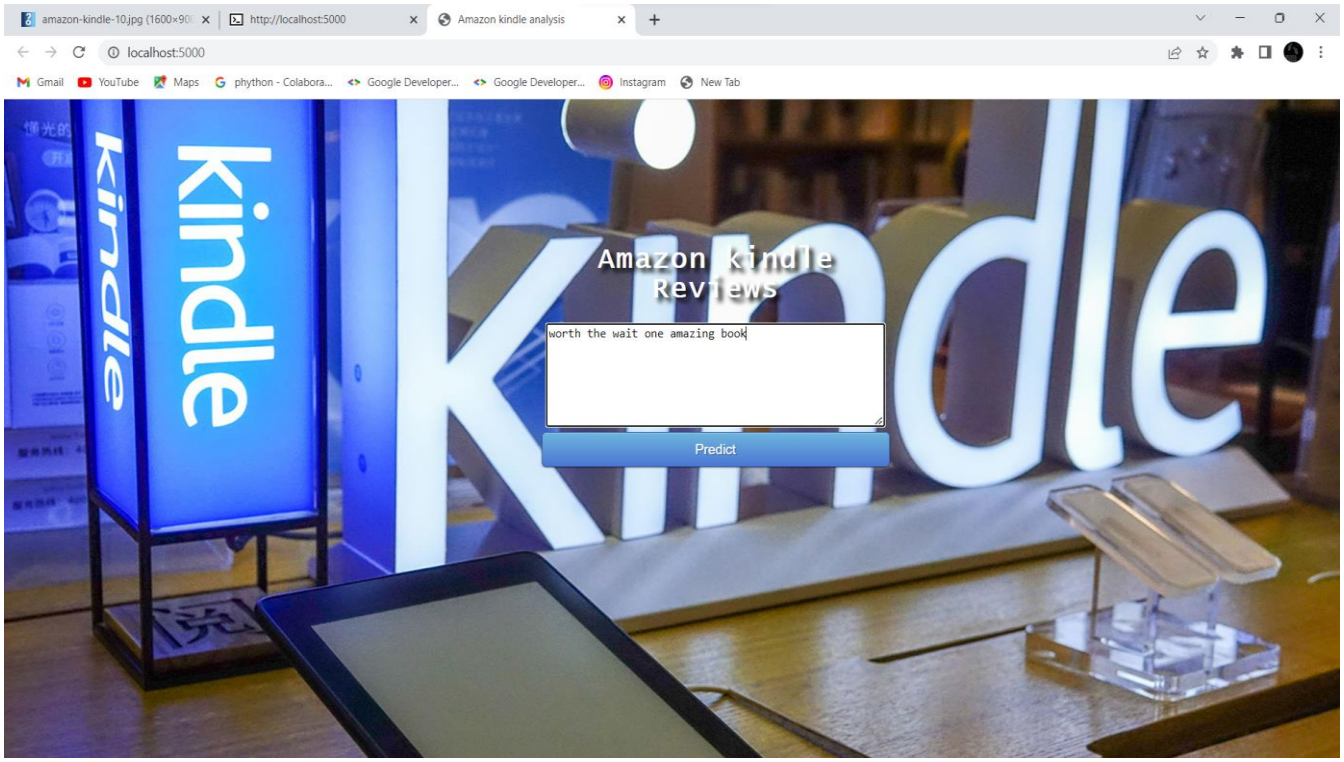
HOME PAGE



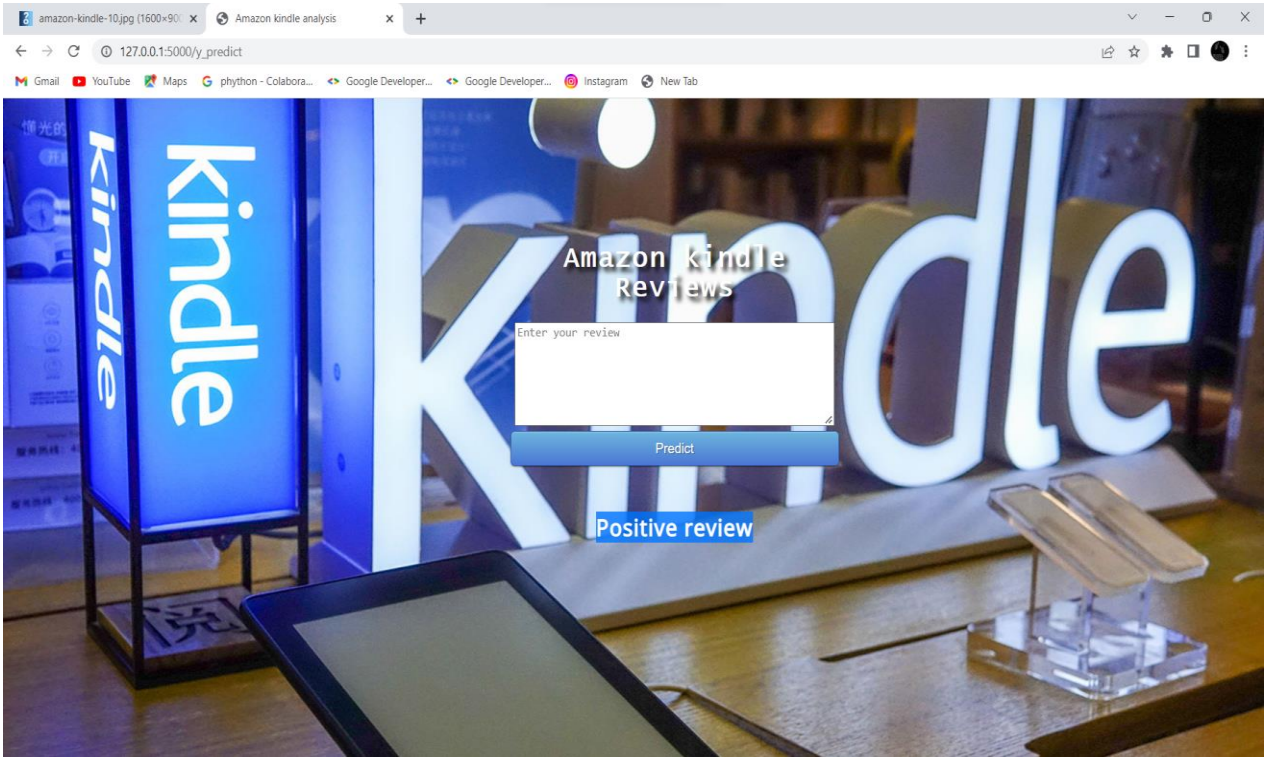
NEGITIVE REVIEW ANALYSIS



NEGATIVE REVIEWS OUTPUT



POSITIVE REVIEW



POSITIVE REVIEWS OUTPUT

7.ADVANTAGES AND DISADVANTAGES

ADVANTAGES

So many books to choose from
Free books
Access to libraries online collections
Cheaper books
Internet, music, and games
Dictionary
Translations
Electronic markers
No book light required
Large print
Long battery life
Search function
Paperless
Convenience

DISADVANTAGES

It’s harder to share
No color
Eye strain and retention
Its electronic

8.APPLICATIONS

1.Kindle unlimited and amazon prime numbers can select and download kindle books directly in the app

2.choose from over six million kindle books

3.understand challenging books

4.Improve your reading comprehension

9.CONCLUSION

It is completely impossible to use only raw text as input for making predictions. Hence,we saw that the preprocessing step played a major role in the complete process of NLP. To get better results, accuracy and make the machine take all the text as tokens, pre-processing of data is to be done carefully looking at the type of contents present in it.The most important thing is to be able to extract the relevant features from the given source of data. This kind of data can often come as a good complementary source in order to extract more learning features and increase the predictive power of the models. And the user is able to predict that the given comment is positive or negative.

10.FUTURE SCOPE

In future, the work can be extended to perform multi-class classification of reviews which will provide a delineated nature of review to the consumer, hence better judgment of the product. It can also be used to predict the rating of a product from the review. This will provide users with a reliable rating because sometimes the rating received by the product and the sentiment of the review do not provide justice to each other. The proposed extension of work will be very beneficial for the e-commerce industry as it will augment user satisfaction and trust.

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[10] Text mining for yelp dataset challenge; Mingshan Wang; University of California San Diego, (2017)

12.APPENDIX

Model Building

1.Dataset

2.Jupiter Notebook

Application Building

1.HTML file

2.CSS file

3.Flask

4.IBM Watson.

SOURCE CODE:

HTML CODE

```
<!DOCTYPE html>
<html >

<head>
  <meta charset="UTF-8">
  <title> Amazon kindle analysis</title>
  <link href='https://fonts.googleapis.com/css?family=Pacifico' rel='stylesheet' type='text/css'>
<link href='https://fonts.googleapis.com/css?family=Arimo' rel='stylesheet' type='text/css'>
<link href='https://fonts.googleapis.com/css?family=Hind:300' rel='stylesheet' type='text/css'>
<link href='https://fonts.googleapis.com/css?family=Open+Sans+Condensed:300' rel='stylesheet'
type='text/css'>
<link rel="stylesheet" href="{{ url_for('static', filename='css/style.css') }}">

<style>
.login{
```

```
top: 40%;
}
body {
  background-image:url("https://cdn.hswstatic.com/gif/amazon-kindle-10.jpg");
  background-color:#B3C99E;
_background-repeat:no-repeat;
  background-position: 50%50%;
  background-size: center;
</style>
</head>

<body align="center">
 <div class="login">
<h1 style="font-family: Lucida Console, Courier, monospace;font-size: 32px;text-shadow:5px 5px 5px black">Amazon kindle Reviews</h1>

    <!-- Main Input For Receiving Query to our DL -->
   <form action="{{ url_for('y_predict')}}"method="post">

         <textarea id="review" placeholder="Enter your review" name="Sentence" rows="7" cols="50"></textarea>

       <button type="submit" class="btn btn-primary btn-block btn-large">Predict</button>

   </form>

  <br>
  <br>
  <span style="color:black;font-size:25px;font-weight:bold">{{ prediction_text }}</span>
```

```
 </div>


</body>
</html>
```

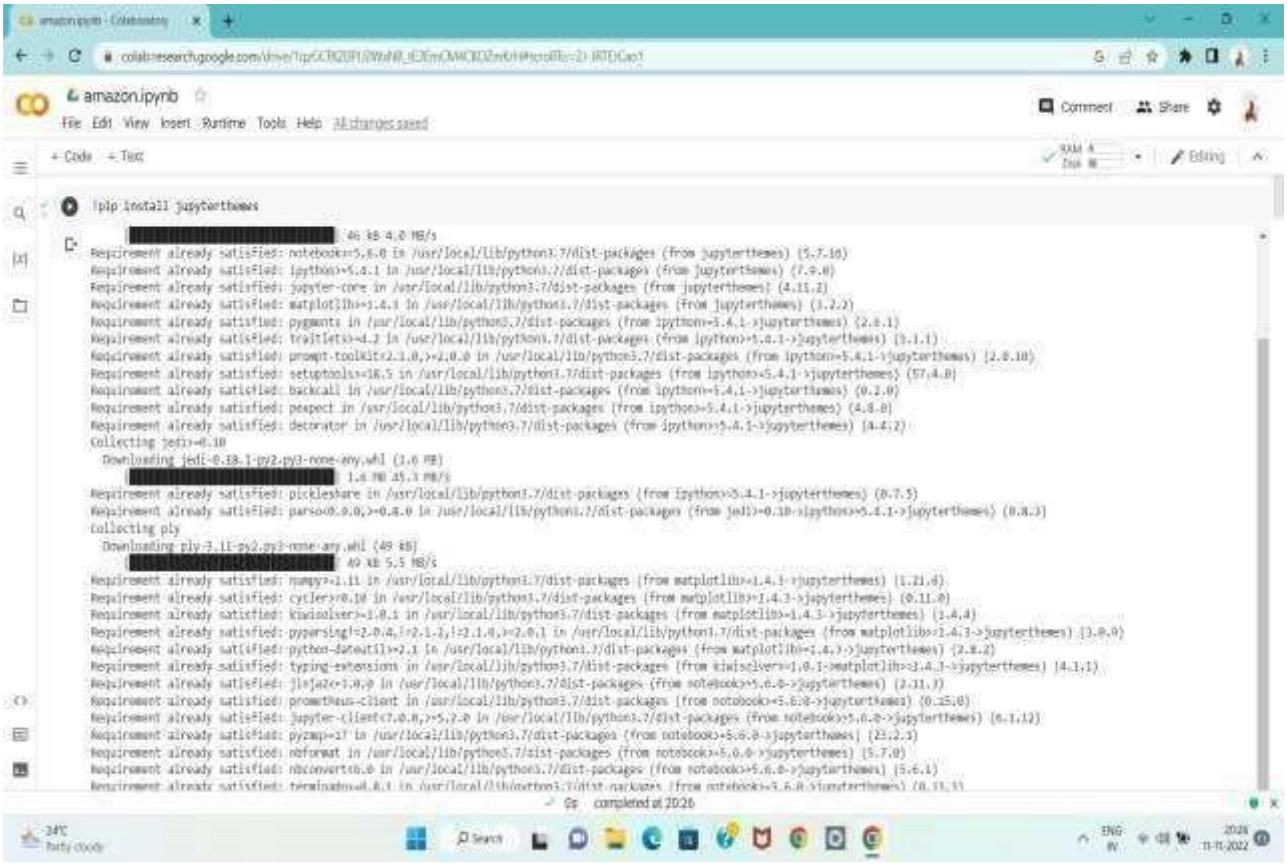
FLASK CODE

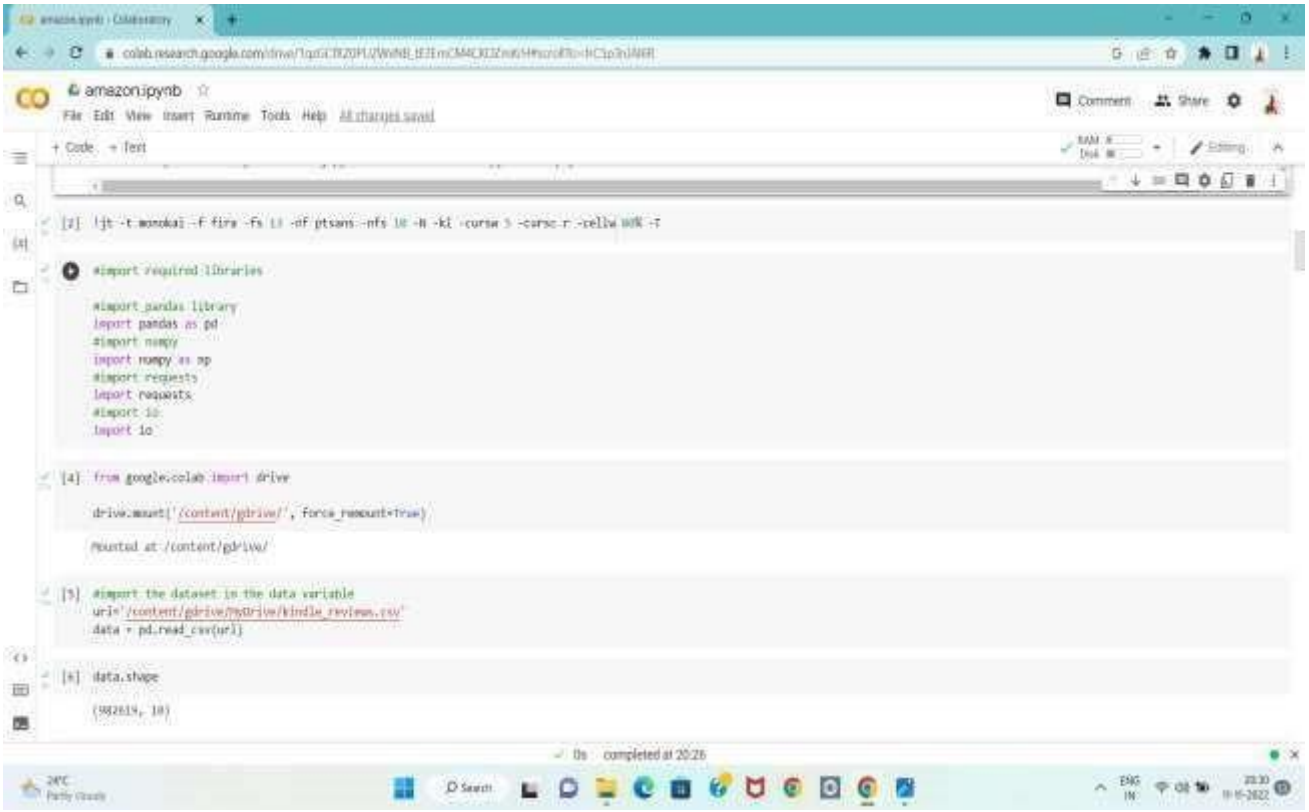
```
import numpy as np
from flask import Flask, request, render_template
from joblib import load
import joblib
from tensorflow.keras.models import load_model
from sklearn.feature_extraction.text import CountVectorizer
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras import models
from tensorflow.keras import backend
from gevent.pywsgi import WSGIServer
import os

tf.keras.backend.clear_session()
app = Flask(__name__,template_folder="templates")
model=tf.keras.models.load_model("amazo.h5")
@app.route('/')
def home():
    return render_template('index3.html')
```

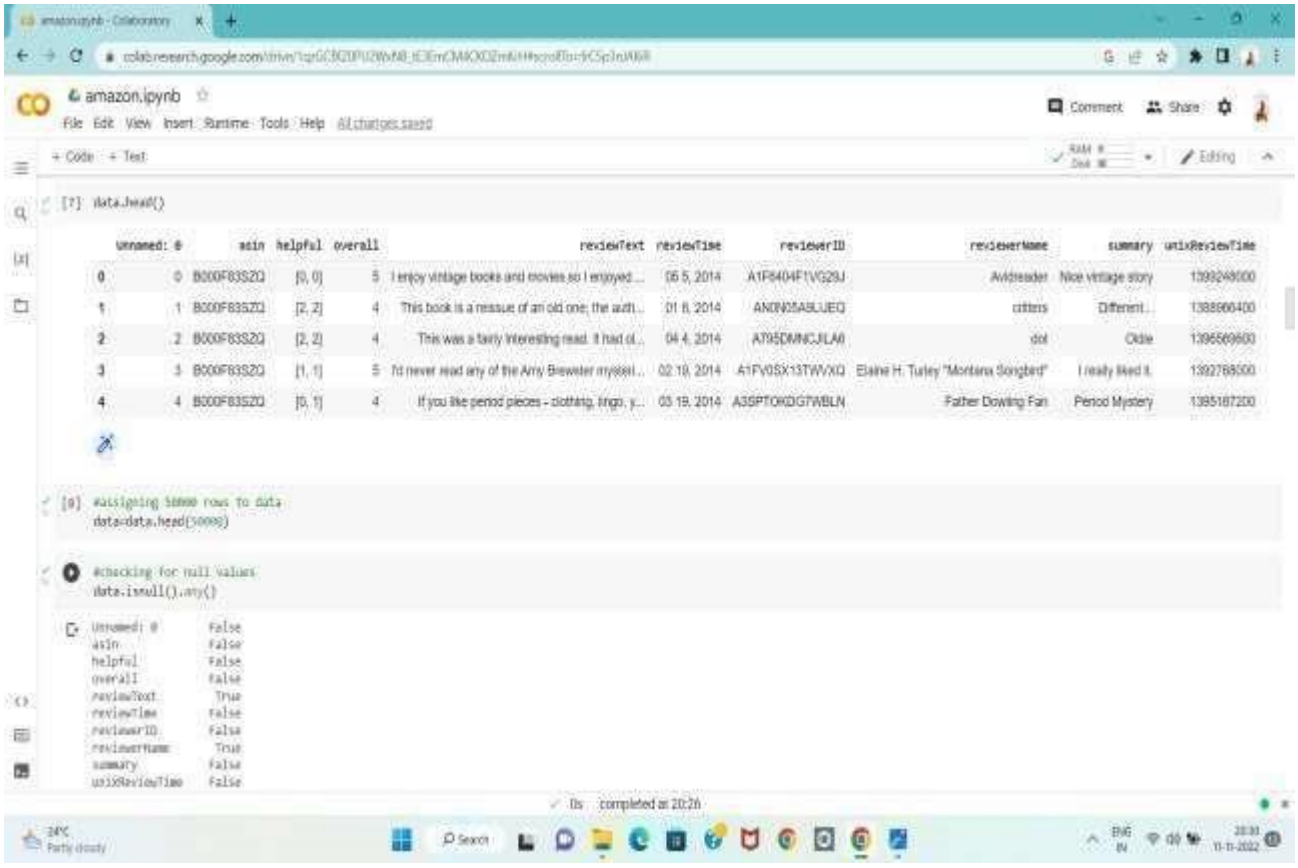
```
@app.route('/y_predict',methods=['POST'])
def y_predict():
    '''
    For rendering results on HTML GUI
    '''
    d = request.form['Sentence']
    print(d)
    loaded=CountVectorizer(decode_error='replace',vocabulary=joblib.load("amazo.save"))
    d=d.split("delimiter")
    result=model.predict(loaded.transform(d))
    print(result)
    prediction=result>0.5

    if prediction[0] == False:
        output="Positive review"
    elif prediction[0] == True:
        output="Negative review"
    return render_template('index3.html', prediction_text='{}'.format(output))

port = os.getenv('VCAP_APP_PORT','5000')

if __name__ == "__main__":
    app.run(debug=False)
    app.secret_key = os.urandom(12)
    app.run(debug=False,host='0.0.0.0',port = port)
```

CODE SNIPPETS

MODELBUILDING

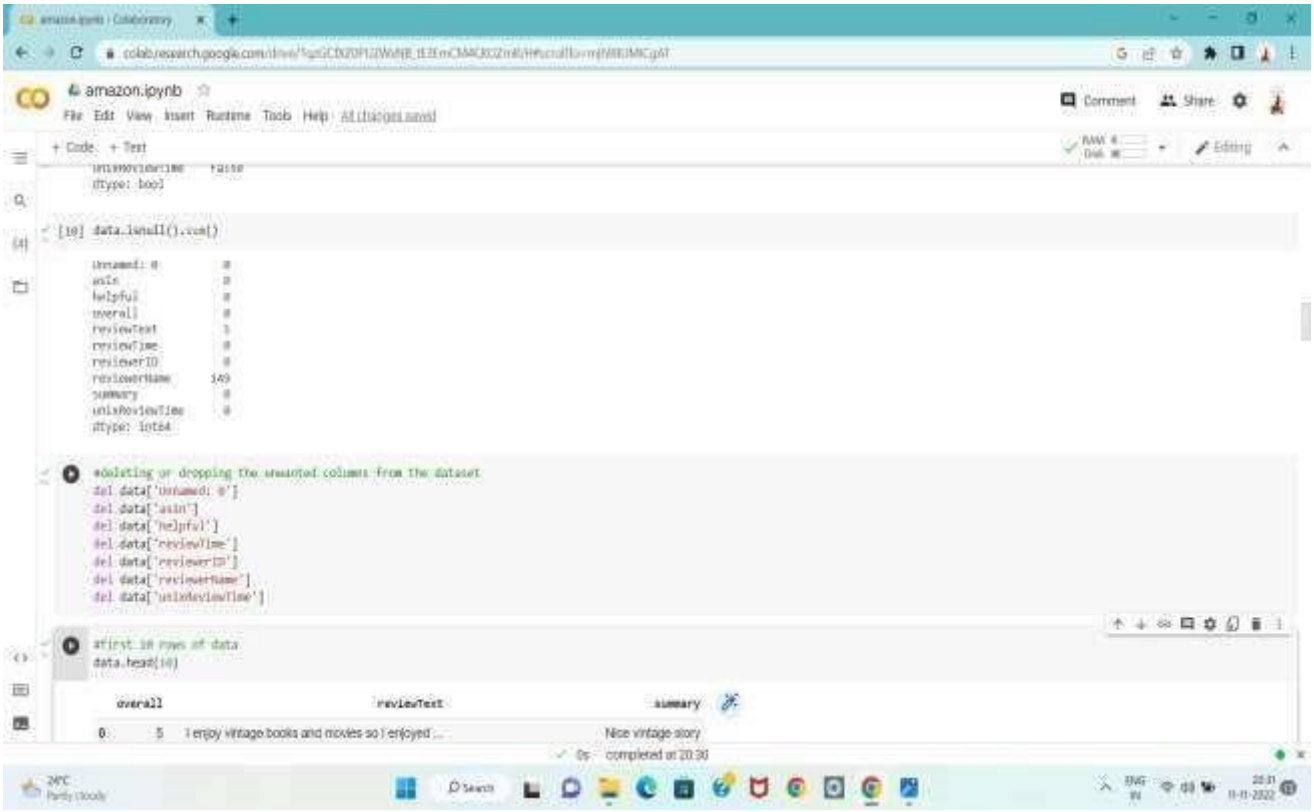


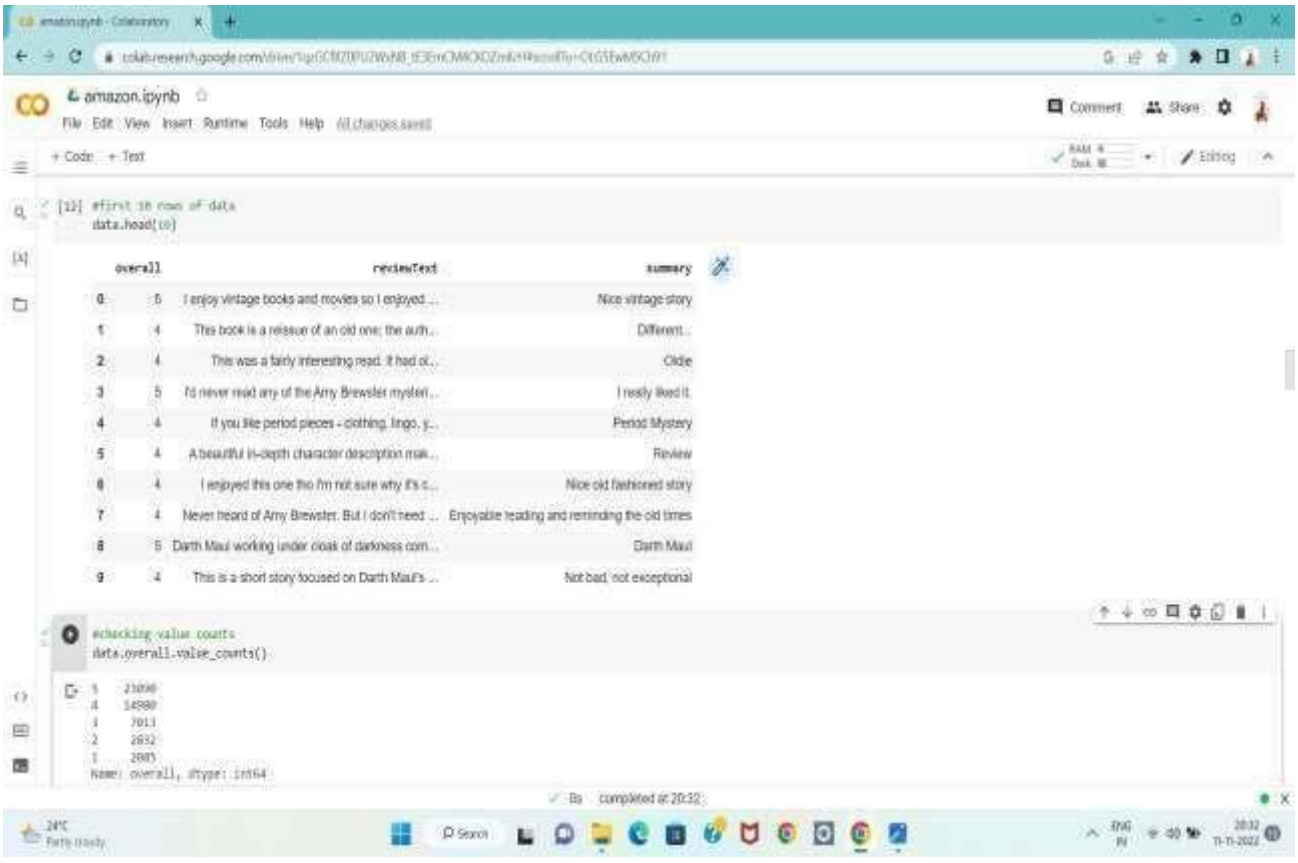


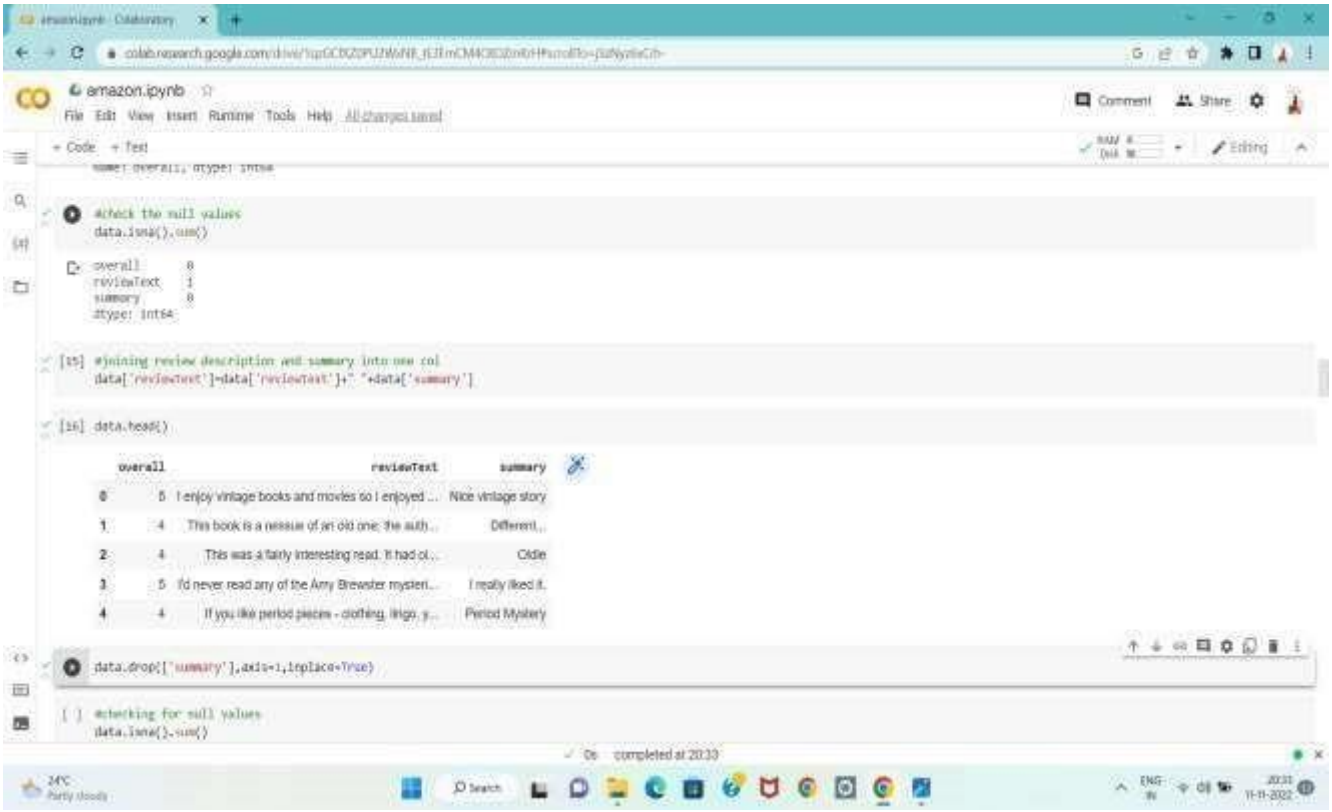


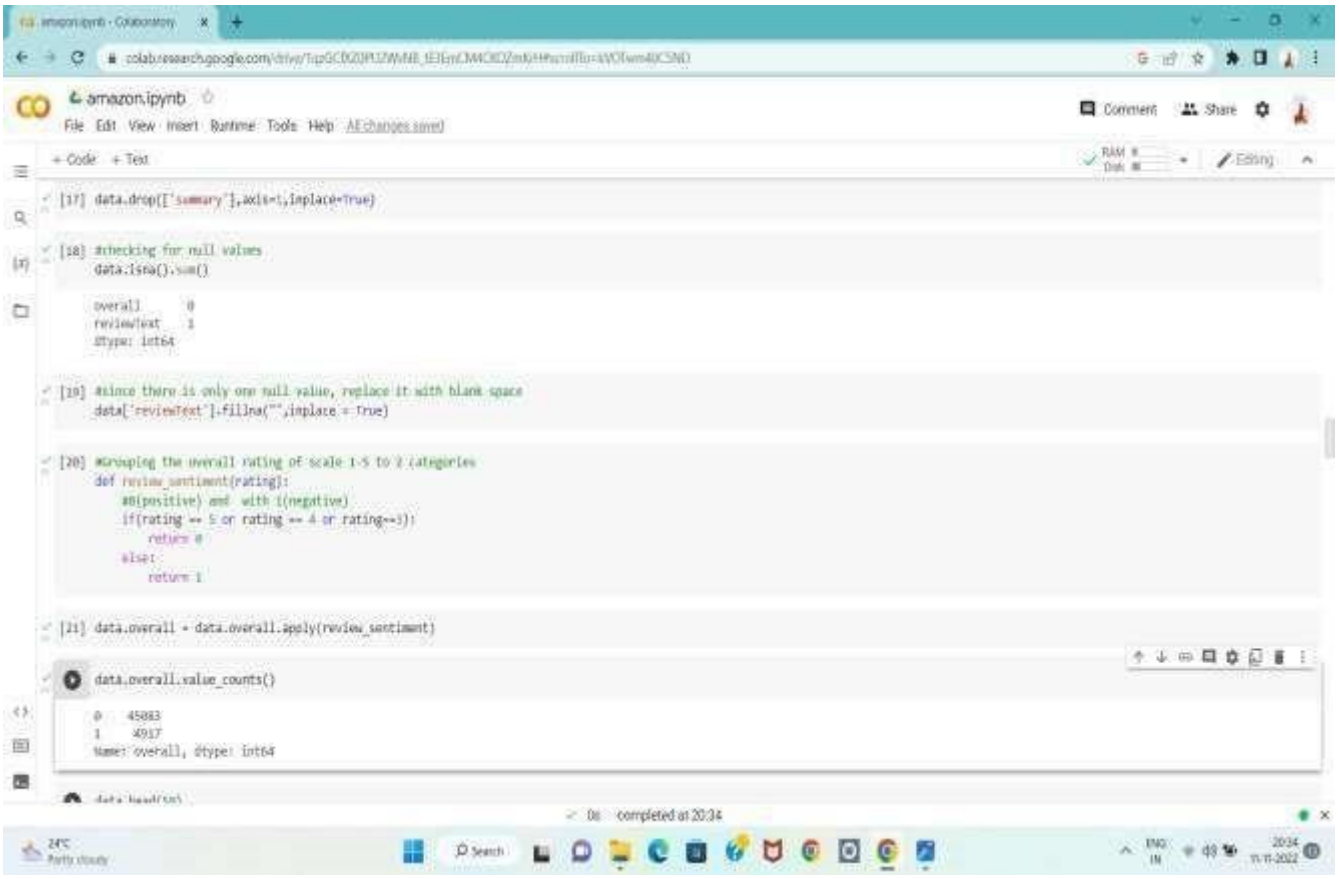
	Unnamed: 0	asin	helpful	overall	reviewText	reviewTime	reviewerID	reviewerName	summary	unixReviewTime
0	0	B000F83SZQ	[0, 0]	5	I enjoy vintage books and movies so I enjoyed ...	05 5, 2014	A1F6404F1VG29J	Avidreader	Nice vintage story	1399248000
1	1	B000F83SZQ	[2, 2]	4	This book is a reissue of an old one; the auth...	01 6, 2014	AN0N05A9LIJEQ	critters	Different...	1388966400
2	2	B000F83SZQ	[2, 2]	4	This was a fairly interesting read. It had ol...	04 4, 2014	A795DMNCJILA6	dot	Oldie	1396569600
3	3	B000F83SZQ	[1, 1]	5	I'd never read any of the Amy Brewster mysteri...	02 19, 2014	A1FV0SX13TWVXQ	Elaine H. Turley "Montana Songbird"	I really liked it.	1392768000
4	4	B000F83SZQ	[0, 1]	4	If you like period pieces - clothing, lingo, y...	03 19, 2014	A3SPTOKDG7WBLN	Father Dowling Fan	Period Mystery	1395187200

Unnamed: 0	False
asin	False
helpful	False
overall	False
reviewText	True
reviewTime	False
reviewerID	False
reviewerName	True
summary	False
unixReviewTime	False


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Test
dtype: bool
[10] data.isnull().sum()
unnamed: 0 0
asin 0
helpful 0
overall 0
reviewText 5
reviewTime 0
reviewerID 0
reviewerName 149
summary 0
unixReviewTime 0
dtype: int64
#deleting or dropping the unwanted columns from the dataset
del data['unnamed: 0']
del data['asin']
del data['helpful']
del data['reviewTime']
del data['reviewerID']
del data['reviewerName']
del data['unixReviewTime']
#first 10 rows of data
data.head(10)
overall reviewText summary
0 5 I enjoy vintage books and movies so I enjoyed ... Nice vintage story
0s completed at 20:30


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Test
[12] #first 10 rows of data
data.head(10)
overall reviewText summary
0 5 I enjoy vintage books and movies so I enjoyed ... Nice vintage story
1 4 This book is a reissue of an old one; the auth... Different...
2 4 This was a fairly interesting read. It had ol... Oldie
3 5 I'd never read any of the Amy Brewster myster... I really liked it.
4 4 If you like period pieces - clothing, lingo, y... Period Mystery
5 4 A beautiful in-depth character description mak... Review
6 4 I enjoyed this one tho I'm not sure why it's c... Nice old fashioned story
7 4 Never heard of Amy Brewster. But I don't need ... Enjoyable reading and reminding the old times
8 5 Darth Maul working under cloak of darkness com... Darth Maul
9 4 This is a short story focused on Darth Maul's ... Not bad, not exceptional
#checking value counts
data.overall.value_counts()
5 21000
4 14980
3 7013
2 2632
1 2085
Name: overall, dtype: int64
0s completed at 20:32


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
Share
+ Code + Text
#check the null values
data.isna().sum()
overall 0
reviewText 1
summary 0
dtype: int64
[15] #joining review description and summary into one col
data['reviewText']=data['reviewText']+" "+data['summary']
[16] data.head()
overall reviewText summary
0 5 I enjoy vintage books and movies so I enjoyed ... Nice vintage story
1 4 This book is a reissue of an old one; the auth... Different...
2 4 This was a fairly interesting read. It had ol... Oldie
3 5 I'd never read any of the Amy Brewster mysteri... I really liked it.
4 4 If you like period pieces - clothing, lingo, y... Period Mystery
data.drop(['summary'],axis=1,inplace=True)
[ ] #checking for null values
data.isna().sum()
0s completed at 20:33


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
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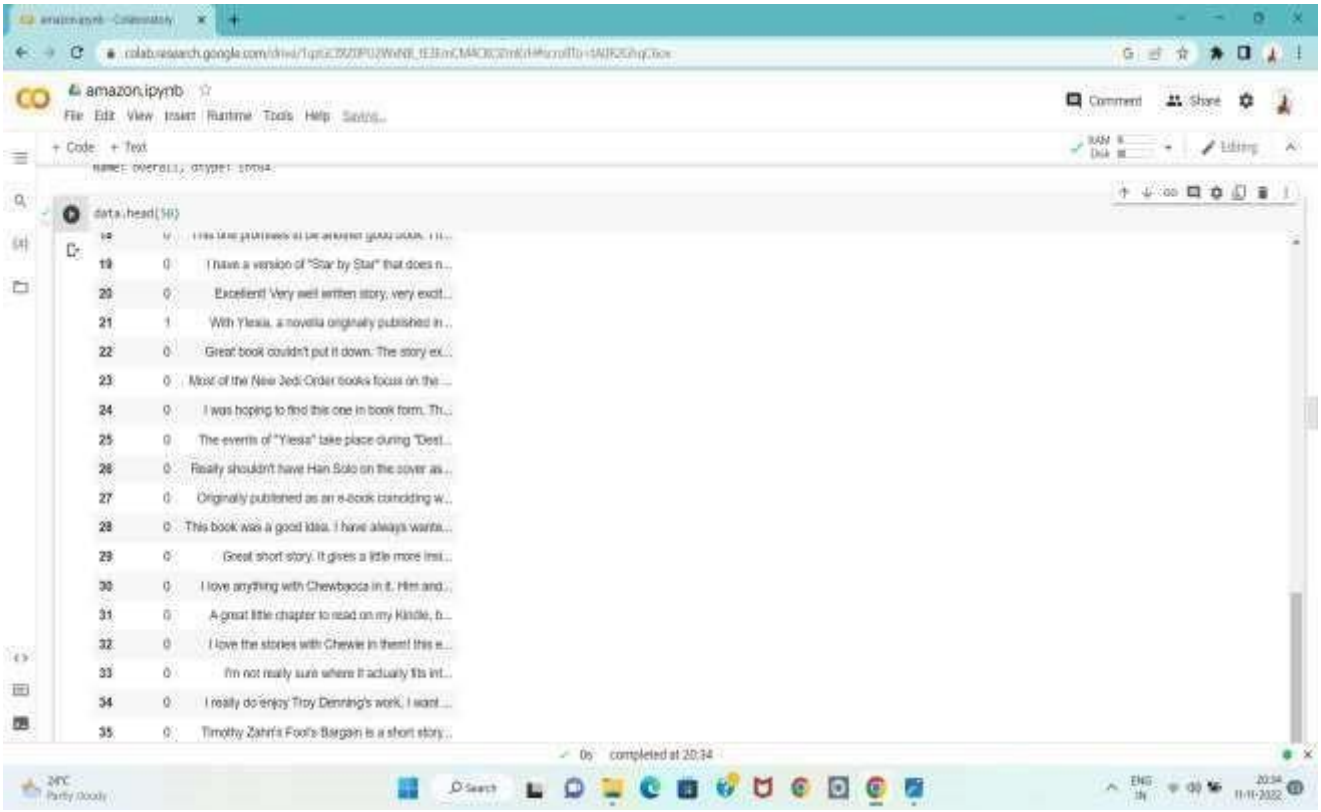
[17] data.drop(['summary'],axis=1,inplace=True)
[18] #checking for null values
data.isna().sum()
overall 0
reviewText 1
dtype: int64
[19] #since there is only one null value, replace it with blank space
data['reviewText'].fillna("",inplace = True)
[20] #Grouping the overall rating of scale 1-5 to 2 categories
def review_sentiment(rating):
#0(positive) and with 1(negative)
if(rating == 5 or rating == 4 or rating==3):
return 0
else:
return 1
[21] data.overall = data.overall.apply(review_sentiment)
data.overall.value_counts()
0 45883
1 4917
Name: overall, dtype: int64
0s completed at 20:34


amazon.ipynb
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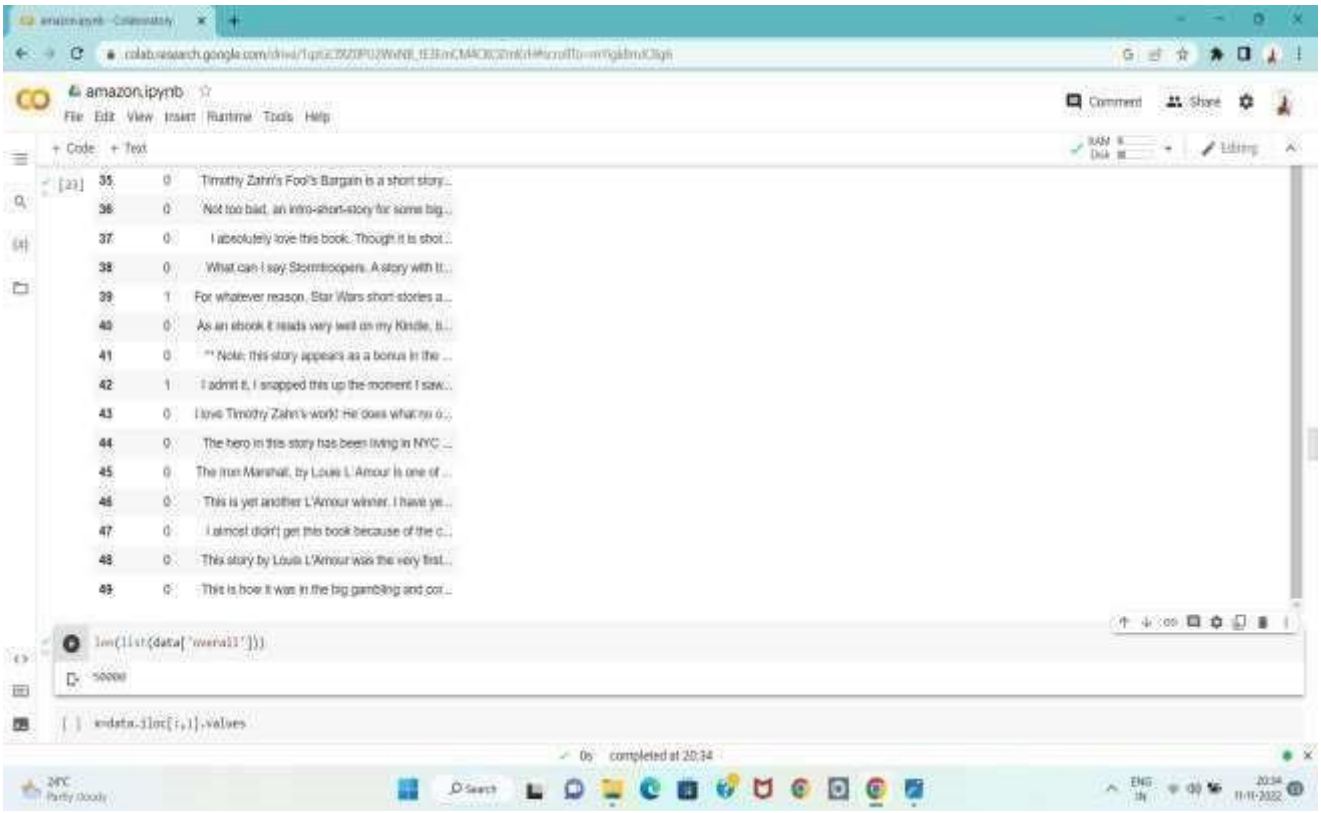
+ Code + Text
data.head(50)
19 0 I have a version of "Star by Star" that does n...
20 0 Excellent! Very well written story, very excit...
21 1 With Yiessa, a novella originally published in...
22 0 Great book couldn't put it down. The story ex...
23 0 Most of the New Jedi Order books focus on the ...
24 0 I was hoping to find this one in book form. Th...
25 0 The events of "Yiessa" take place during "Dest...
26 0 Really shouldn't have Han Solo on the cover as...
27 0 Originally published as an e-book consisting w...
28 0 This book was a good idea. I have always wante...
29 0 Great short story. It gives a little more insi...
30 0 I love anything with Chewbacca in it. Him and...
31 0 A great little chapter to read on my Kindle, b...
32 0 I love the stories with Chewie in them! this e...
33 0 I'm not really sure where it actually fits int...
34 0 I really do enjoy Troy Denning's work. I want ...
35 0 Timothy Zahn's Fool's Bargain is a short story...
0s completed at 20:34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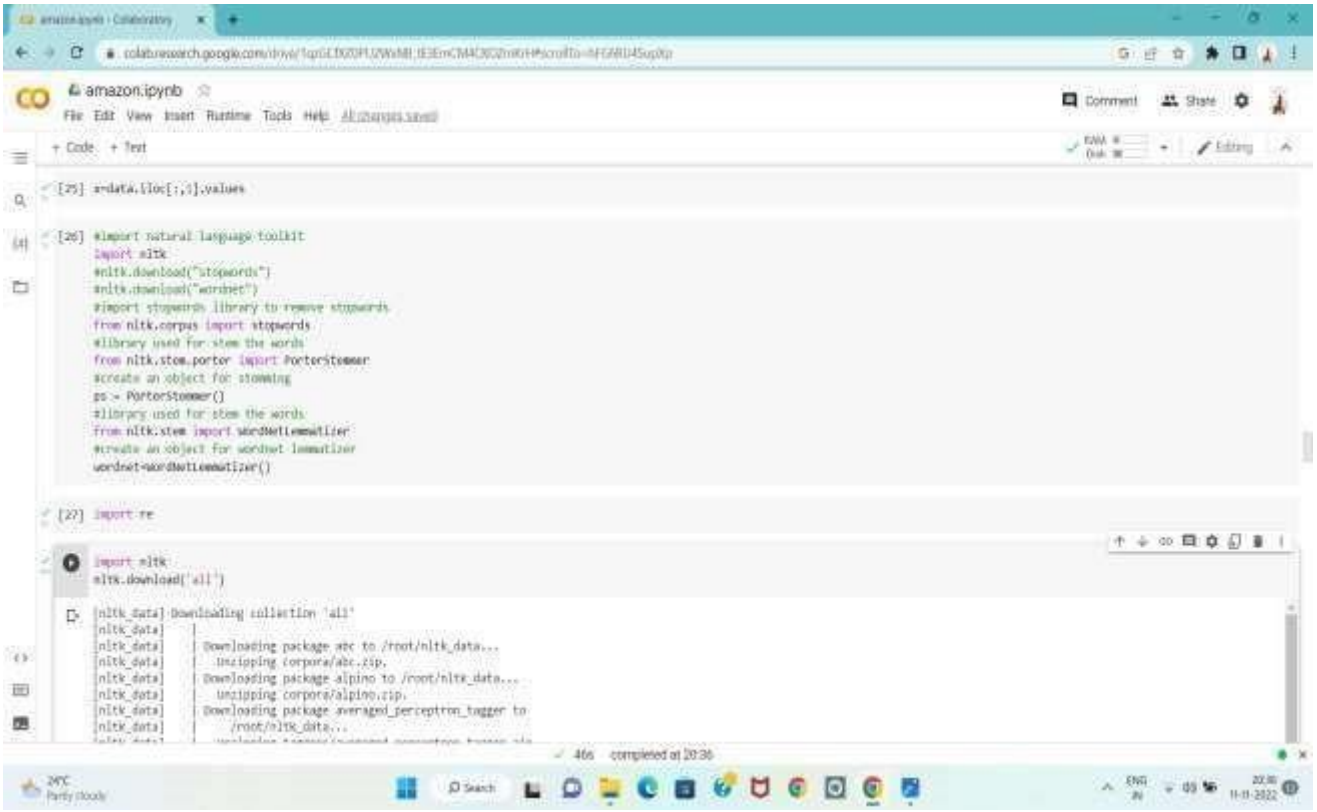
[23] 35 0 Timothy Zahn's Fool's Bargain is a short story...
36 0 Not too bad, an intro-short-story for some big...
37 0 I absolutely love this book. Though it is shor...
38 0 What can I say Stormtroopers. A story with lit...
39 1 For whatever reason, Star Wars short stories a...
40 0 As an ebook it reads very well on my Kindle, b...
41 0 ** Note: this story appears as a bonus in the ...
42 1 I admit it, I snapped this up the moment I saw...
43 0 I love Timothy Zahn's work! He does what no o...
44 0 The hero in this story has been living in NYC ...
45 0 The Iron Marshal, by Louis L'Amour is one of ...
46 0 This is yet another L'Amour winner. I have ye...
47 0 I almost didn't get this book because of the c...
48 0 This story by Louis L'Amour was the very first...
49 0 This is how it was in the big gambling and cor...
len(list(data['overall']))
50000
[ ] xdata.iloc[:,1].values
0s completed at 20:34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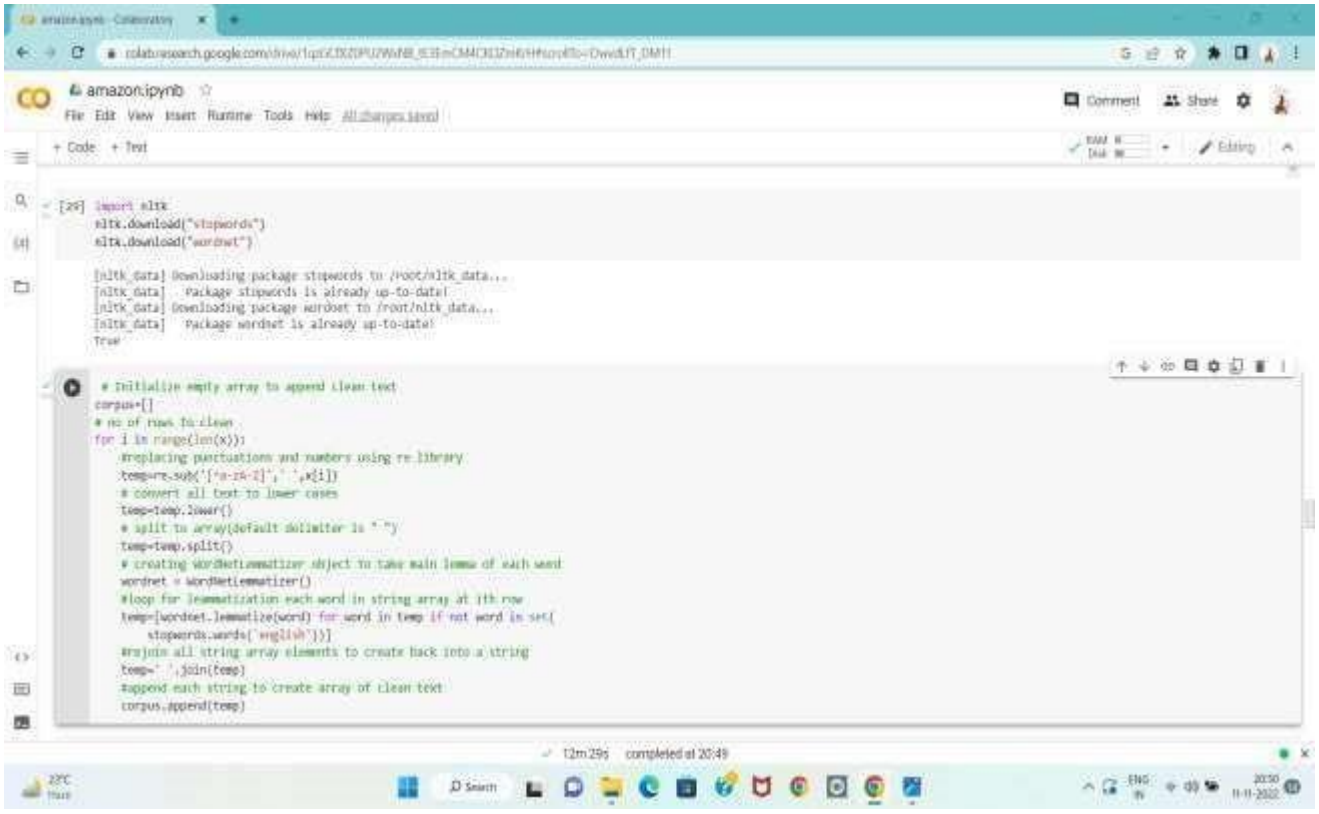
[25] x=data.iloc[:,1].values
[26] #import natural language toolkit
import nltk
#nltk.download("stopwords")
#nltk.download("wordnet")
#import stopwords library to remove stopwords
from nltk.corpus import stopwords
#library used for stem the words
from nltk.stem.porter import PorterStemmer
#create an object for stemming
ps = PorterStemmer()
#library used for stem the words
from nltk.stem import WordNetLemmatizer
#create an object for wordnet lemmatizer
wordnet=WordNetLemmatizer()
[27] import re
import nltk
nltk.download('all')
[nltk_data] Downloading collection 'all'
[nltk_data] |
[nltk_data] | Downloading package abc to /root/nltk_data...
[nltk_data] | Unzipping corpora/abc.zip.
[nltk_data] | Downloading package alpino to /root/nltk_data...
[nltk_data] | Unzipping corpora/alpino.zip.
[nltk_data] | Downloading package averaged_perceptron_tagger to
[nltk_data] | /root/nltk_data...
46s completed at 20:36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File Edit View Insert Runtime Tools Help
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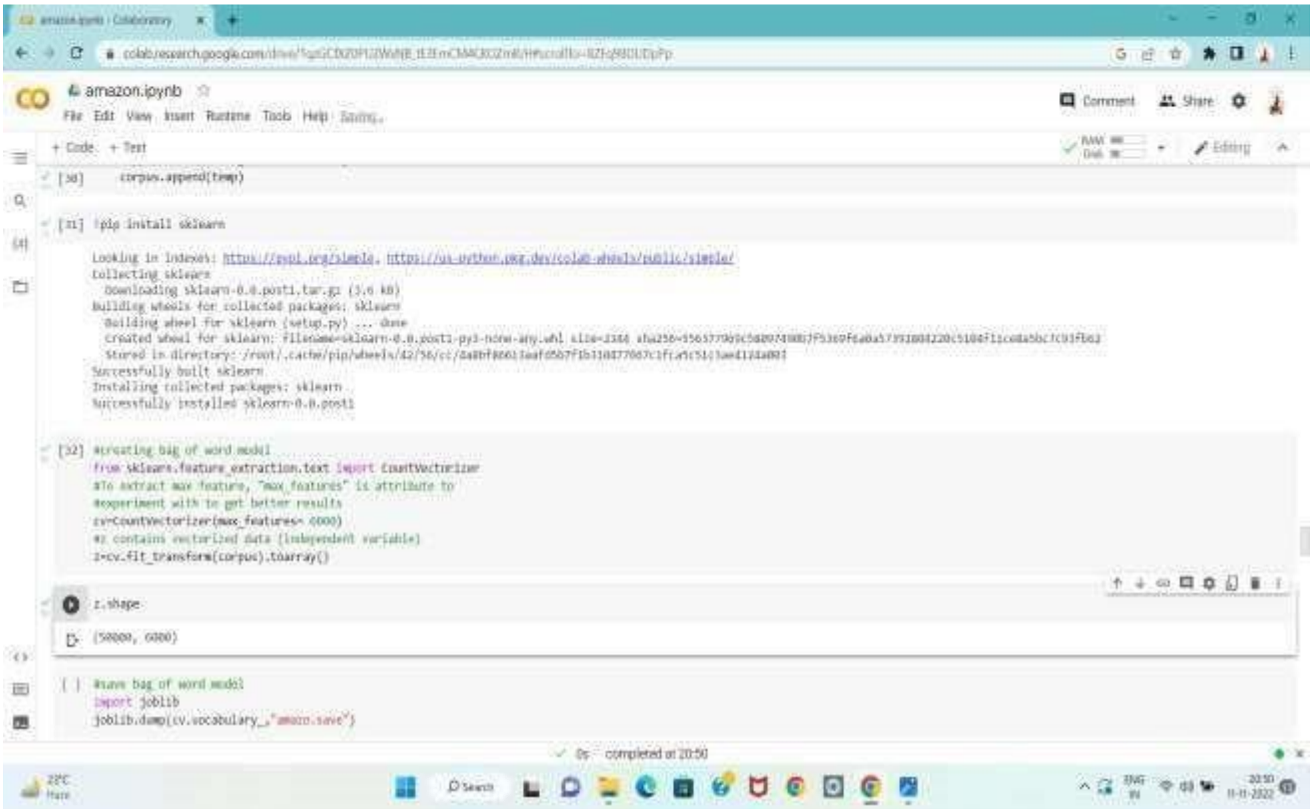
[29] import nltk
nltk.download("stopwords")
nltk.download("wordnet")
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data] Package stopwords is already up-to-date!
[nltk_data] Downloading package wordnet to /root/nltk_data...
[nltk_data] Package wordnet is already up-to-date!
True
# Initialize empty array to append clean text
corpus=[]
# no of rows to clean
for i in range(len(x)):
#replacing punctuations and numbers using re library
temp=re.sub('[^a-zA-Z]',' ',x[i])
# convert all text to lower cases
temp=temp.lower()
# split to array(default delimiter is " ")
temp=temp.split()
# creating WordNetLemmatizer object to take main lemma of each word
wordnet = WordNetLemmatizer()
#loop for lemmatization each word in string array at ith row
temp=[wordnet.lemmatize(word) for word in temp if not word in set(
stopwords.words('english'))]
#rejoin all string array elements to create back into a string
temp=' '.join(temp)
#append each string to create array of clean text
corpus.append(temp)
12m 29s completed at 20:49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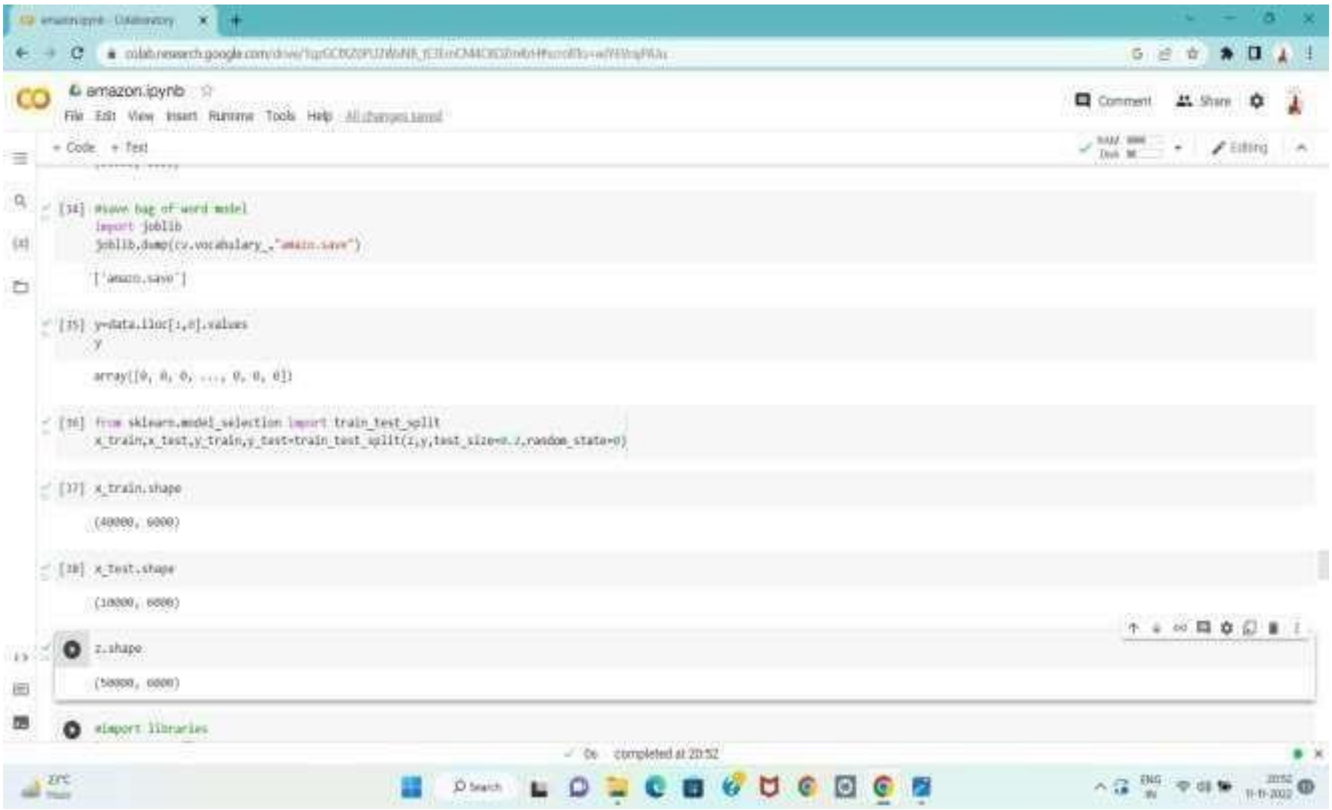
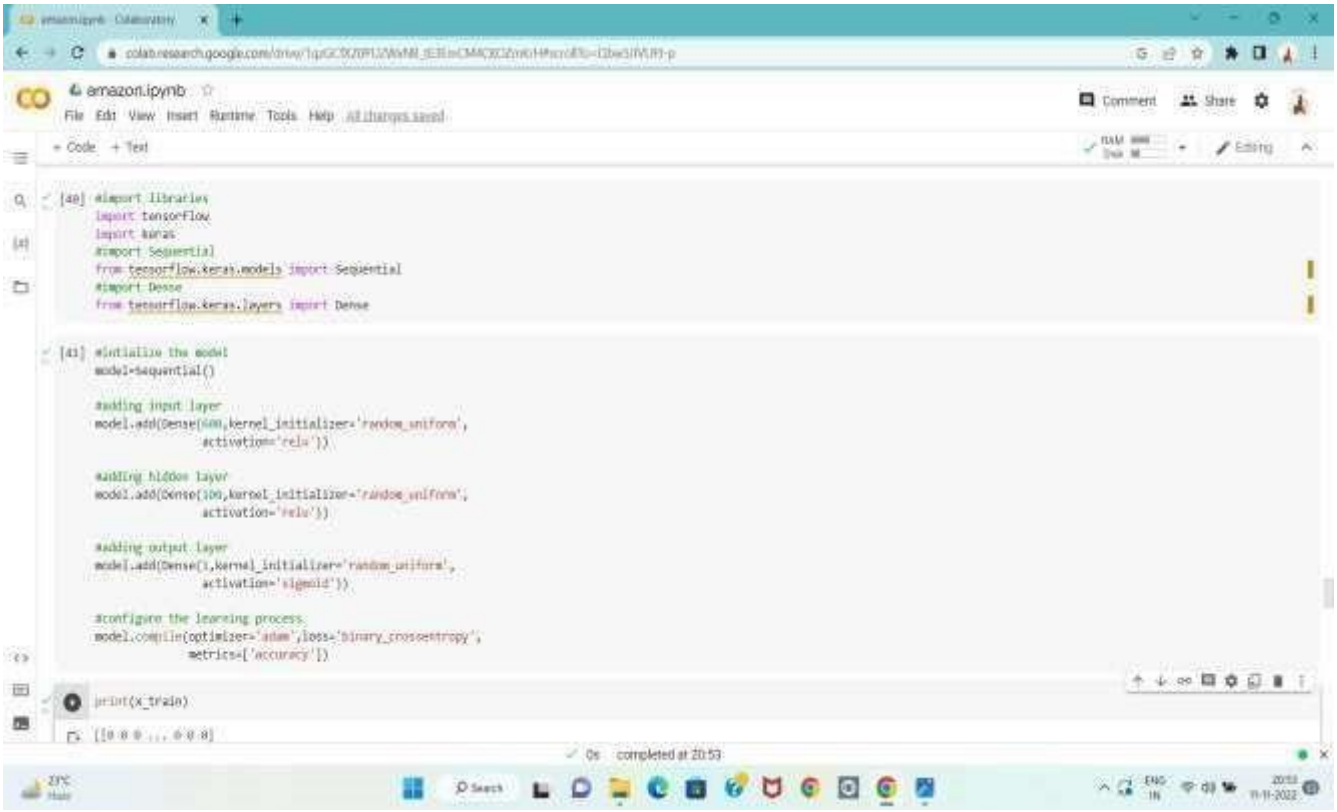
File Edit View Insert Runtime Tools Help
+ Code + Text
[30] corpus.append(temp)
[31] !pip install sklearn
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting sklearn
Building wheels for collected packages: sklearn
Successfully built sklearn
Installing collected packages: sklearn
Successfully installed sklearn-0.0.post1
[32] #creating bag of word model
from sklearn.feature_extraction.text import CountVectorizer
cv=CountVectorizer(max_features= 6000)
z=cv.fit_transform(corpus).toarray()
z.shape
(50000, 6000)
#save bag of word model
import joblib
joblib.dump(cv.vocabulary_,"amazn.save")


amazon.ipynb
File Edit View Insert Runtime Tools Help
+ Code + Text
[34] #save bag of word model
import joblib
joblib.dump(cv.vocabulary_,"amazn.save")
['amazn.save']
[35] y=data.iloc[:,0].values
y
array([0, 0, 0, ..., 0, 0, 0])
[36] from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(z,y,test_size=0.2,random_state=0)
[37] x_train.shape
(40000, 6000)
[38] x_test.shape
(10000, 6000)
z.shape
(50000, 6000)
#import libraries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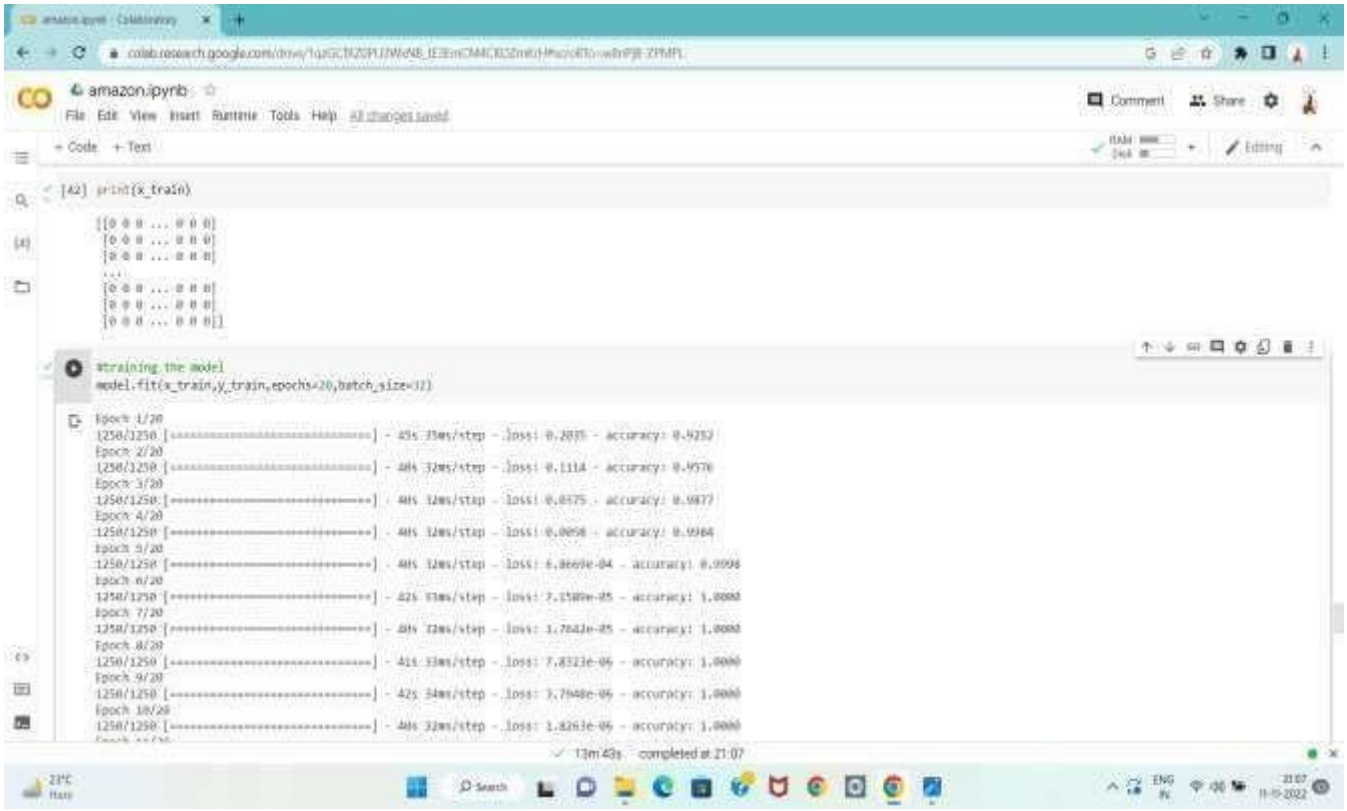
Editing
[40] #import libraries
import tensorflow
import keras
#import Sequential
from tensorflow.keras.models import Sequential
#import Dense
from tensorflow.keras.layers import Dense
[41] #initialize the model
model=Sequential()
#adding input layer
model.add(Dense(600,kernel_initializer='random_uniform',
activation='relu'))
#adding hidden layer
model.add(Dense(100,kernel_initializer='random_uniform',
activation='relu'))
#adding output layer
model.add(Dense(1,kernel_initializer='random_uniform',
activation='sigmoid'))
#configure the learning process
model.compile(optimizer='adam',loss='binary_crossentropy',
metrics=['accuracy'])
print(x_train)
[[0 0 0 ... 0 0 0]
0s completed at 20:53


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
Comment
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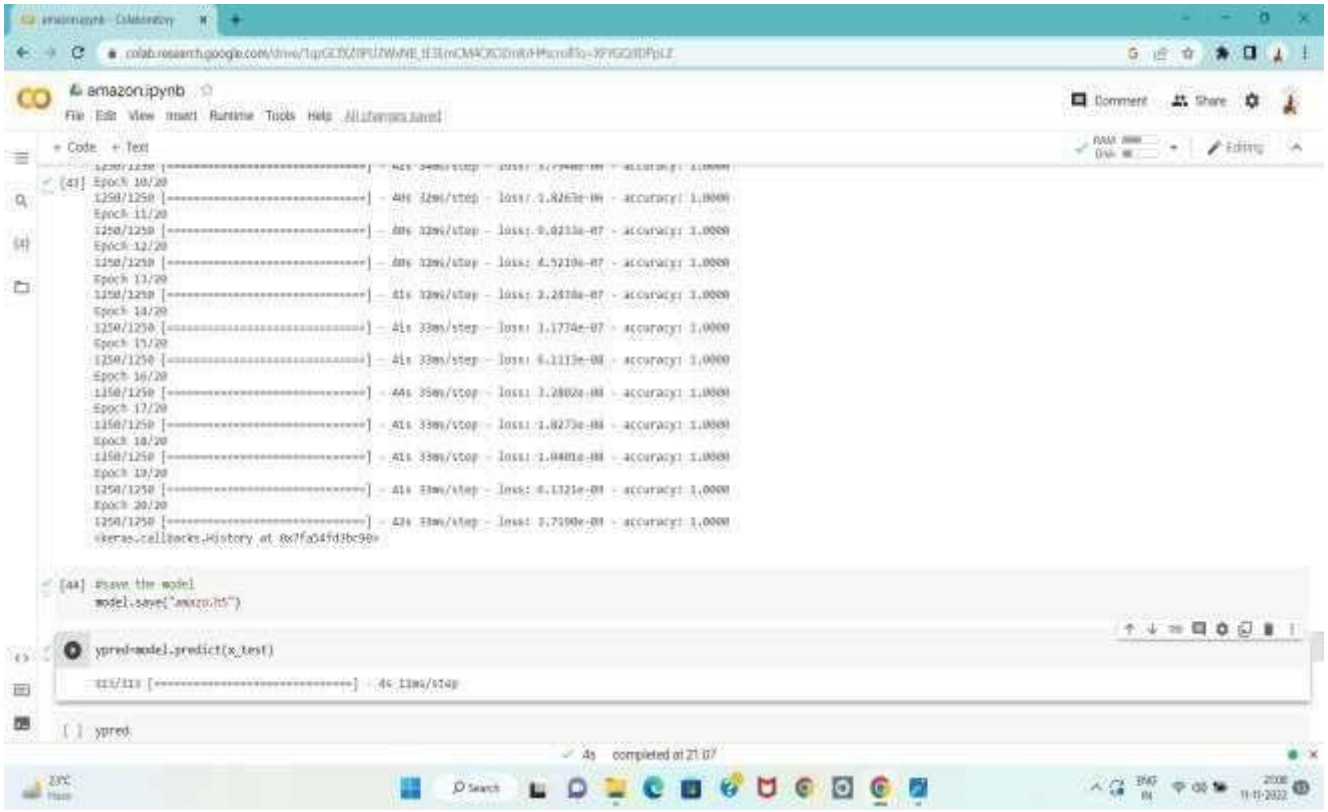
Editing
[42] print(x_train)
[[0 0 0 ... 0 0 0]
[0 0 0 ... 0 0 0]
[0 0 0 ... 0 0 0]
...
[0 0 0 ... 0 0 0]
[0 0 0 ... 0 0 0]
[0 0 0 ... 0 0 0]]
#training the model
model.fit(x_train,y_train,epochs=20,batch_size=32)
Epoch 1/20
1250/1250 [==========] - 45s 35ms/step - loss: 0.2035 - accuracy: 0.9252
Epoch 2/20
1250/1250 [==========] - 40s 32ms/step - loss: 0.1114 - accuracy: 0.9578
Epoch 3/20
1250/1250 [==========] - 40s 32ms/step - loss: 0.0575 - accuracy: 0.9877
Epoch 4/20
1250/1250 [==========] - 40s 32ms/step - loss: 0.0098 - accuracy: 0.9984
Epoch 5/20
1250/1250 [==========] - 40s 32ms/step - loss: 6.8669e-04 - accuracy: 0.9998
Epoch 6/20
1250/1250 [==========] - 42s 33ms/step - loss: 7.1589e-05 - accuracy: 1.0000
Epoch 7/20
1250/1250 [==========] - 40s 32ms/step - loss: 1.7642e-05 - accuracy: 1.0000
Epoch 8/20
1250/1250 [==========] - 41s 33ms/step - loss: 7.8321e-06 - accuracy: 1.0000
Epoch 9/20
1250/1250 [==========] - 42s 34ms/step - loss: 3.7948e-06 - accuracy: 1.0000
Epoch 10/20
1250/1250 [==========] - 40s 32ms/step - loss: 1.8261e-06 - accuracy: 1.0000
13m 43s completed at 21:07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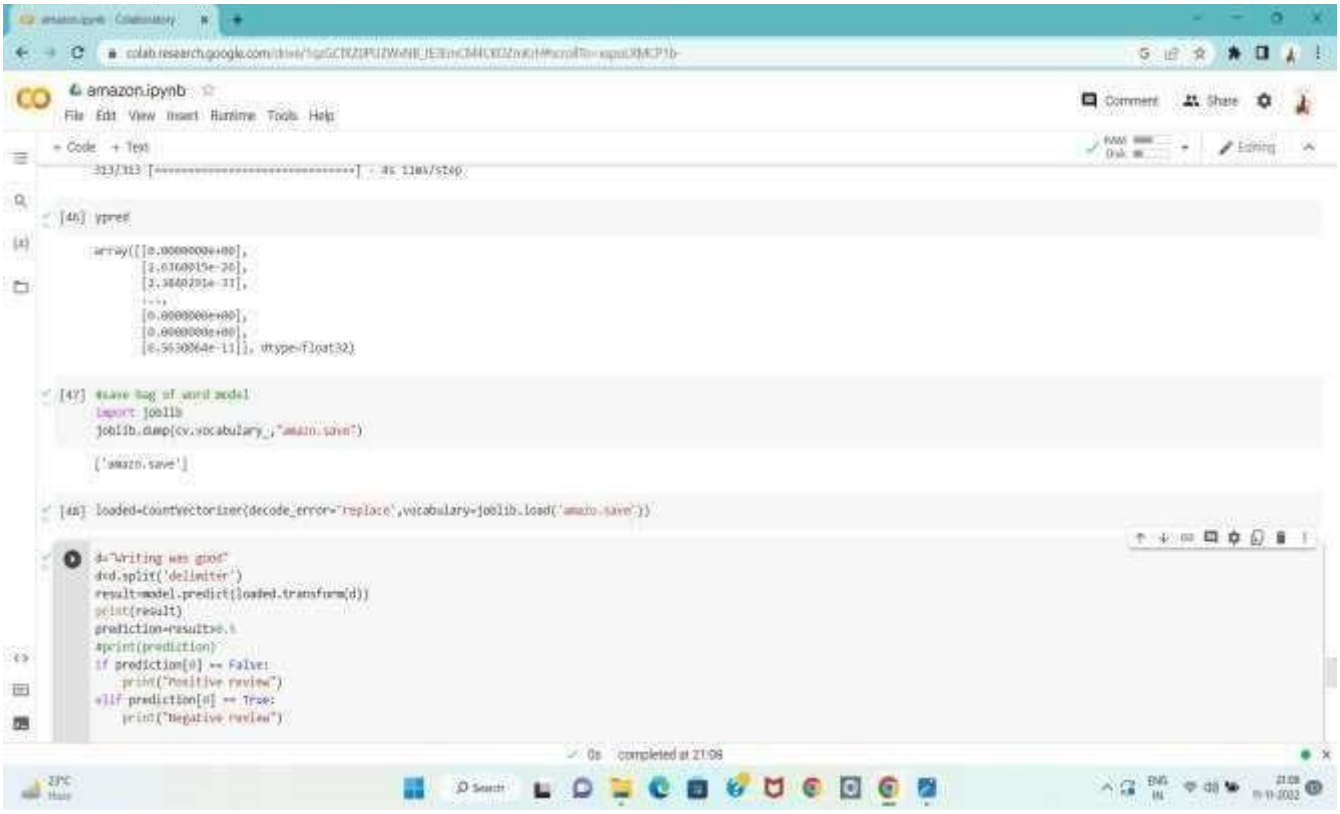
File Edit View Insert Runtime Tools Help
+ Code + Text
Epoch 10/20
1250/1250 [==========] - 40s 32ms/step - loss: 1.8263e-06 - accuracy: 1.0000
Epoch 11/20
1250/1250 [==========] - 40s 32ms/step - loss: 9.0213e-07 - accuracy: 1.0000
Epoch 12/20
1250/1250 [==========] - 40s 32ms/step - loss: 4.5210e-07 - accuracy: 1.0000
Epoch 13/20
1250/1250 [==========] - 41s 32ms/step - loss: 2.2670e-07 - accuracy: 1.0000
Epoch 14/20
1250/1250 [==========] - 41s 33ms/step - loss: 1.1774e-07 - accuracy: 1.0000
Epoch 15/20
1250/1250 [==========] - 41s 33ms/step - loss: 6.1113e-08 - accuracy: 1.0000
Epoch 16/20
1250/1250 [==========] - 44s 35ms/step - loss: 3.2802e-08 - accuracy: 1.0000
Epoch 17/20
1250/1250 [==========] - 41s 33ms/step - loss: 1.8273e-08 - accuracy: 1.0000
Epoch 18/20
1250/1250 [==========] - 41s 33ms/step - loss: 1.0401e-08 - accuracy: 1.0000
Epoch 19/20
1250/1250 [==========] - 41s 33ms/step - loss: 6.1321e-09 - accuracy: 1.0000
Epoch 20/20
1250/1250 [==========] - 42s 33ms/step - loss: 3.7190e-09 - accuracy: 1.0000
<keras.callbacks.History at 0x7fa54fd3bc90>
#save the model
model.save("amazo.h5")
ypred=model.predict(x_test)
313/313 [==========] - 4s 11ms/step
ypred
4s completed at 21:07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File Edit View Insert Runtime Tools Help
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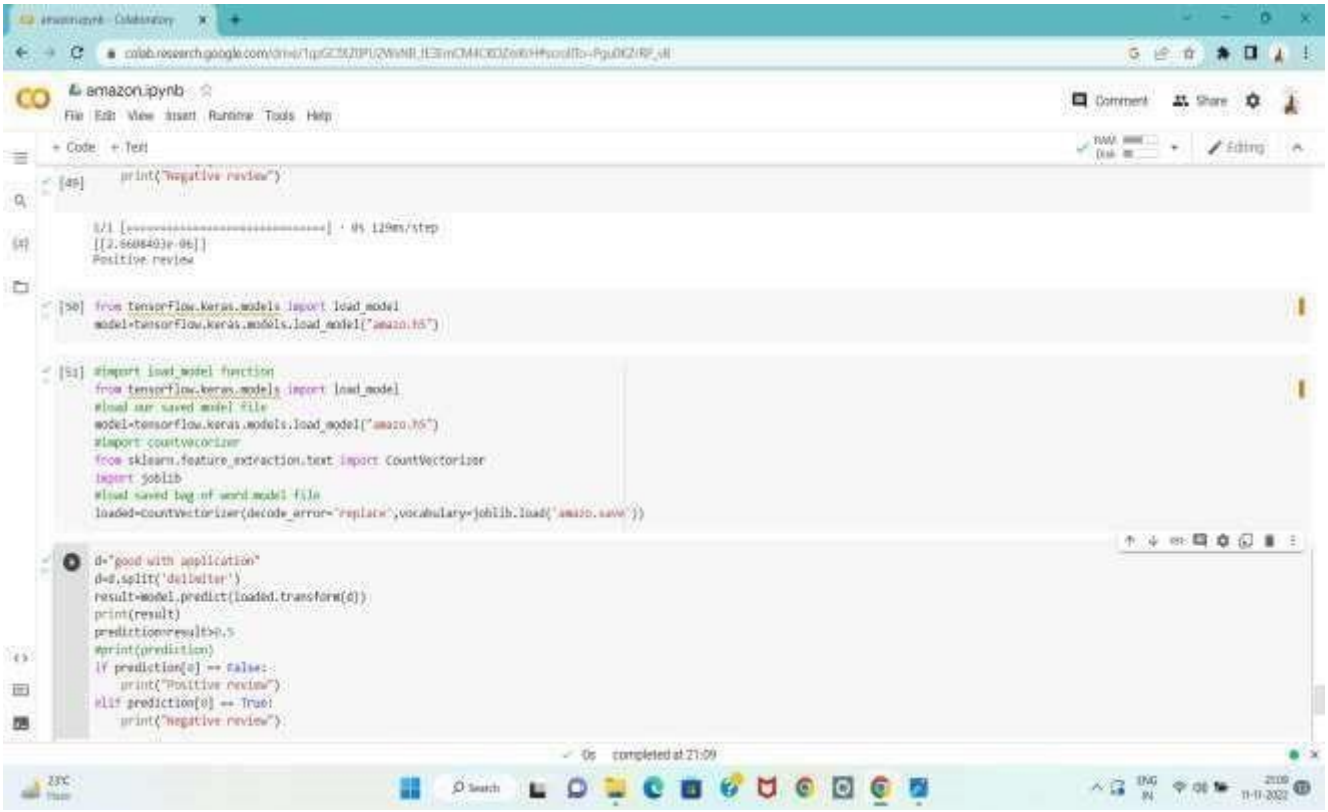
313/313 [==========] - 4s 11ms/step
ypred
array([[0.00000000e+00],
[1.0360015e-26],
[1.3840201e-31],
...,
[0.00000000e+00],
[0.00000000e+00],
[6.5630064e-11]], dtype=float32)
#save bag of word model
import joblib
joblib.dump(cv.vocabulary_,"amazo.save")
['amazo.save']
loaded=CountVectorizer(decode_error="replace",vocabulary=joblib.load('amazo.save'))
d="Writing was good"
d=d.split('delimiter')
result=model.predict(loaded.transform(d))
print(result)
prediction=result>0.5
#print(prediction)
if prediction[0] == False:
print("Positive review")
elif prediction[0] == True:
print("Negative review")
0s completed at 21:08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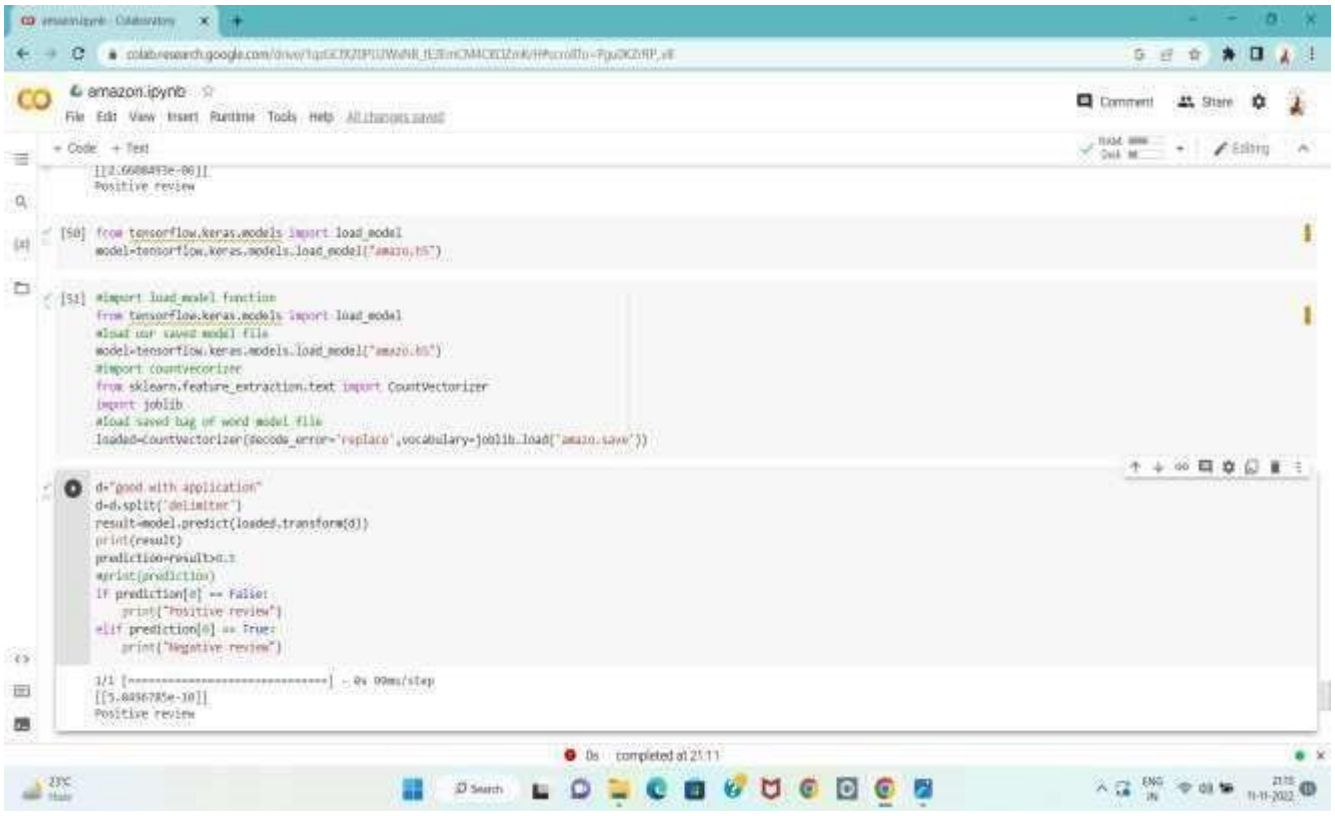
print("Negative review")
1/1 [==============================] - 0s 129ms/step
[[2.6688493e-06]]
Positive review
from tensorflow.keras.models import load_model
model=tensorflow.keras.models.load_model("amazo.h5")
#import load_model function
from tensorflow.keras.models import load_model
#load our saved model file
model=tensorflow.keras.models.load_model("amazo.h5")
#import countvecorizer
from sklearn.feature_extraction.text import CountVectorizer
import joblib
#load saved bag of word model file
loaded=CountVectorizer(decode_error='replace',vocabulary=joblib.load('amazo.save'))
d="good with application"
d=d.split('delimiter')
result=model.predict(loaded.transform(d))
print(result)
prediction=result>0.5
#print(prediction)
if prediction[0] == False:
print("Positive review")
elif prediction[0] == True:
print("Negative review")
0s completed at 21:09


amazon.ipynb
File Edit View Insert Runtime Tools Help All changes saved
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[[2.6688493e-06]]
Positive review
from tensorflow.keras.models import load_model
model=tensorflow.keras.models.load_model("amazo.h5")
#import load_model function
from tensorflow.keras.models import load_model
#load our saved model file
model=tensorflow.keras.models.load_model("amazo.h5")
#import countvecorizer
from sklearn.feature_extraction.text import CountVectorizer
import joblib
#load saved bag of word model file
loaded=CountVectorizer(decode_error='replace',vocabulary=joblib.load('amazo.save'))
d="good with application"
d=d.split('delimiter')
result=model.predict(loaded.transform(d))
print(result)
prediction=result>0.5
#print(prediction)
if prediction[0] == False:
print("Positive review")
elif prediction[0] == True:
print("Negative review")
1/1 [==============================] - 0s 99ms/step
[[5.8896785e-10]]
Positive review
0s completed at 21:11