Assignment-4

AssignmentDate	17 november2022
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StudentRollNumber	421319104006
MaximumMarks	2Marks

Question1:

DownloadthedatasetL

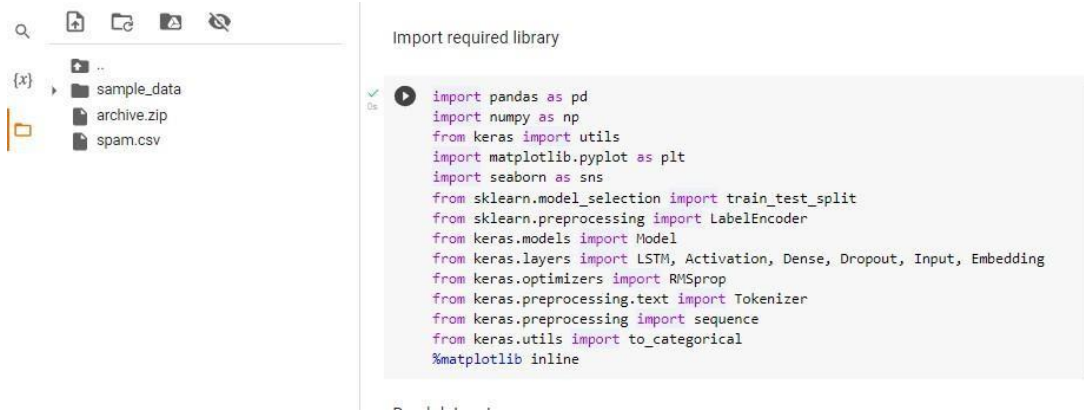
ink:
https://drive.google.com/file/d/1Sjqx5H5R86tRp2YZKzzd4_iEfjChZ3ob/view?usp=sharing

Question2:

ImportrequiredlibraryS

olution:

```
importpandas as
pdimport numpyas
npfromkerasimportutil
s
importmatplotlib.pyplotasplti
mportseabornassns
fromsklearn.model_selectionimporttrain_test_splitfr
om sklearn.preprocessingimport
LabelEncoderfromkeras.modelsimportModel
fromkeras.layersimportLSTM,Activation,Dense,Dropout,Input,Embeddingfromker
as.optimizersimportRMSprop
fromkeras.preprocessing.textimportTokenizerfr
om keras.preprocessingimport
sequencefromkeras.utilsimportto_categorical
```



Question3:

Readdatasetanddopre-

processingSolution:

Readdataset

```
!unzip"/content/archive.zip"

df=pd.read_csv('spam.csv',delimiter=',',encoding='latin-1')df
```

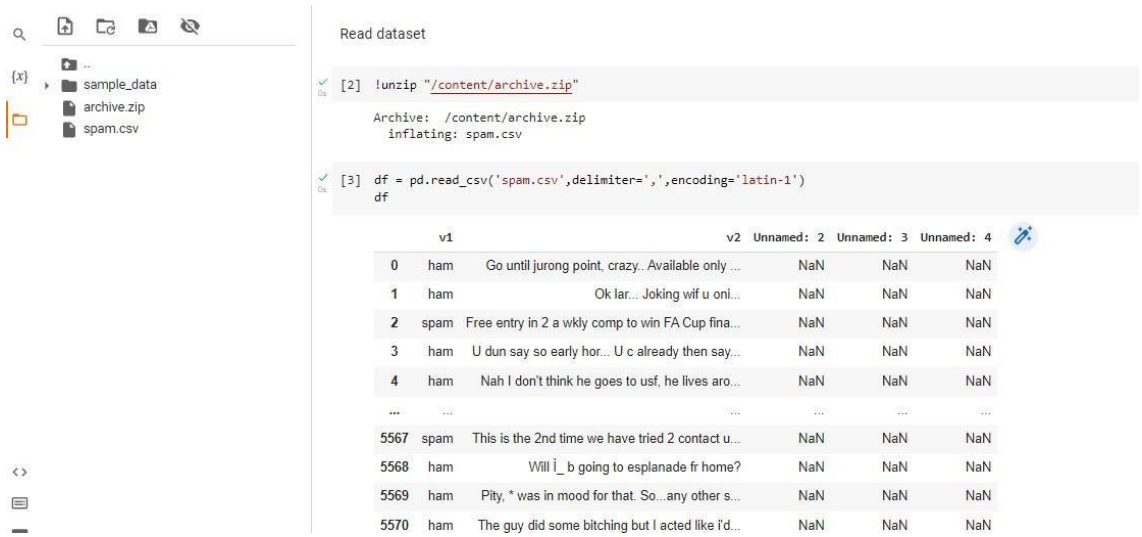
Preprocessing

```
df.drop(['Unnamed:2','Unnamed:3','Unnamed:4'],axis=1,inplace=True)df

sns.countplot(df.v1,palette='Set3')pl
t.xlabel('Label')
plt.title('Numberofhamandspammessages')

X =
df.v2Y=d
f.v1
le=LabelEncoder()Y=
le.fit_transform(Y)Y=
Y.reshape(-1,1)

X_train,X_test,Y_train,Y_test=

train_test_split(X,Y,test_size=0.15)max_words=1000
max_len=150
tok=
Tokenizer(num_words=max_words)tok.fit_on_texts
(X_train)
sequences=tok.texts_to_sequences(X_train)
sequences_matrix=utils.pad_sequences(sequences,maxlen=max_len)
```

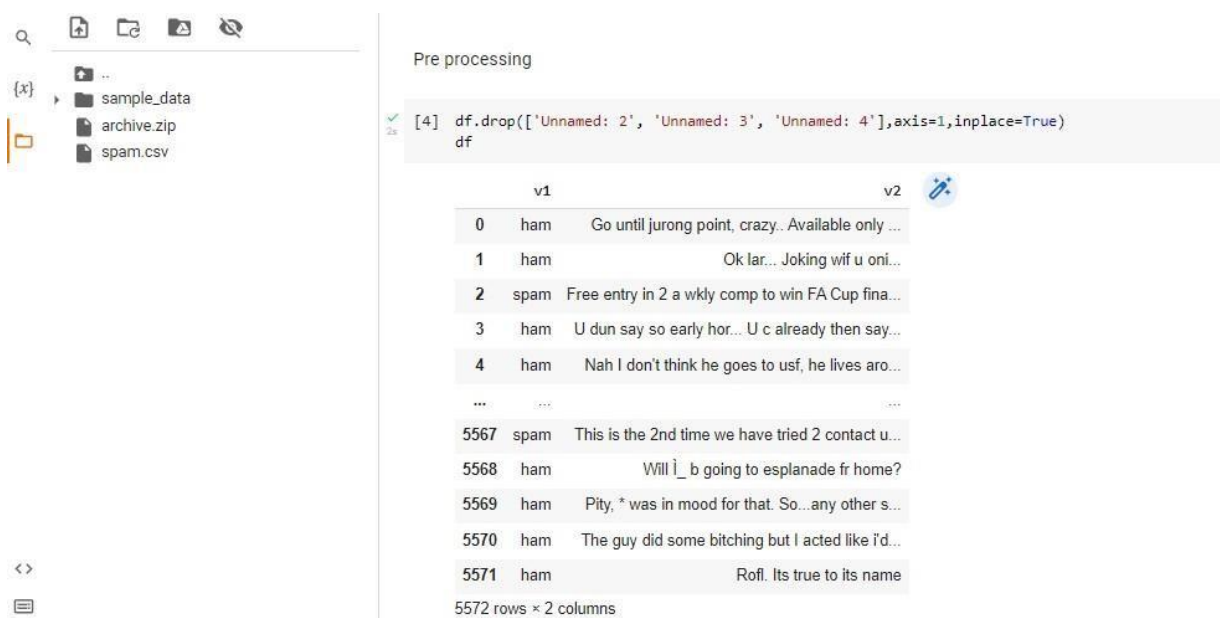
sequences_matrix.shapes

equences_matrix.ndim

sequences_matrix= np.reshape(sequences_matrix,(4736,150,1))sequences_matrix.ndim



	v1	v2	Unnamed: 2	Unnamed: 3	Unnamed: 4
0	ham	Go until jurong point, crazy.. Available only ...	NaN	NaN	NaN
1	ham	Ok lar... Joking wif u oni...	NaN	NaN	NaN
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...	NaN	NaN	NaN
3	ham	U dun say so early hor... U c already then say...	NaN	NaN	NaN
4	ham	Nah I don't think he goes to usf, he lives aro...	NaN	NaN	NaN
...	...	...	...	...	...
5567	spam	This is the 2nd time we have tried 2 contact u...	NaN	NaN	NaN
5568	ham	Will Ì_ b going to esplanade fr home?	NaN	NaN	NaN
5569	ham	Pity, * was in mood for that. So...any other s...	NaN	NaN	NaN
5570	ham	The guy did some bitching but I acted like i'd...	NaN	NaN	NaN



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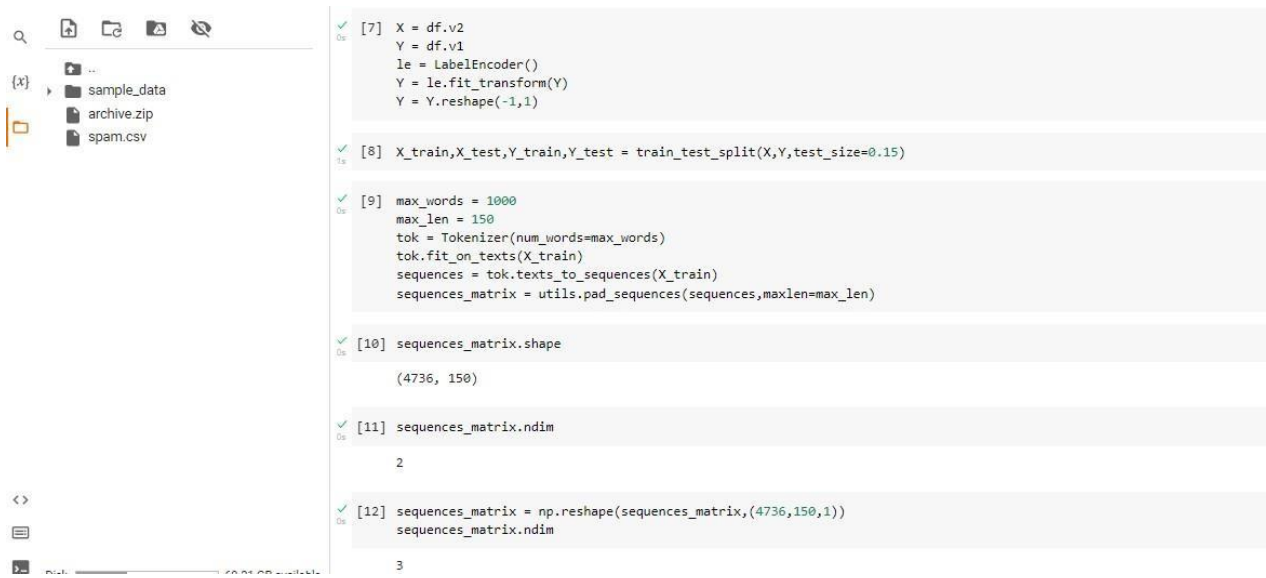
...	...	...
5567	spam	This is the 2nd time we have tried 2 contact u...
5568	ham	Will Ì_ b going to esplanade fr home?
5569	ham	Pity, * was in mood for that. So...any other s...
5570	ham	The guy did some bitching but I acted like i'd...
5571	ham	Rofl. Its true to its name

5572 rows × 2 columns



Question4:

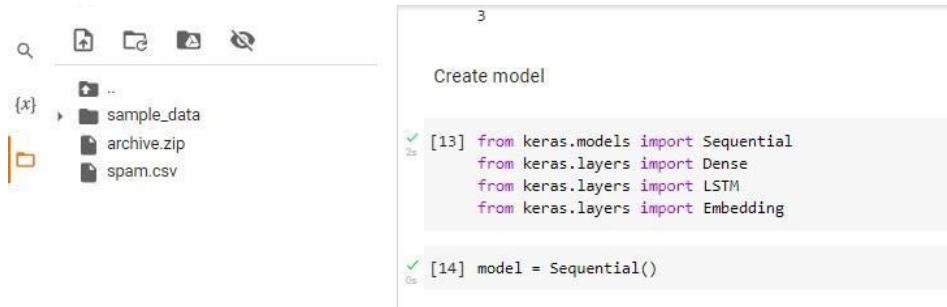
Create

modelSolutio

n:

fromkeras.modelsimportSequentialfr
omkeras.layersimportDense
fromkeras.layersimportLSTM
fromkeras.layersimportEmbedding

model=Sequential()

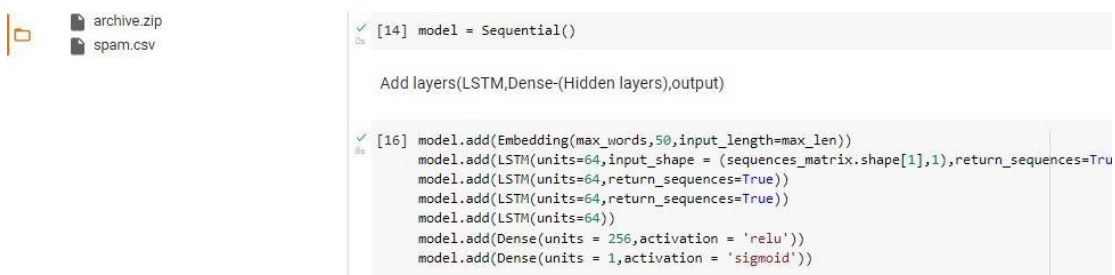


Question5:

Addlayers(LSTM,Dense-

(Hiddenlayers),output)Solution:

```
model.add(Embedding(max_words,50,input_length=max_len))model.add(LSTM(units=64,input_shap
e =
(sequences_matrix.shape[1],1),return_sequences=True))model.add(LSTM(units=64,return_sequence
s=True))model.add(LSTM(units=64,return_sequences=True))
model.add(LSTM(units=64))model.add(Dense(unit
s = 256,activation =
'relu'))model.add(Dense(units=1,activation='sigmoi
d'))
```

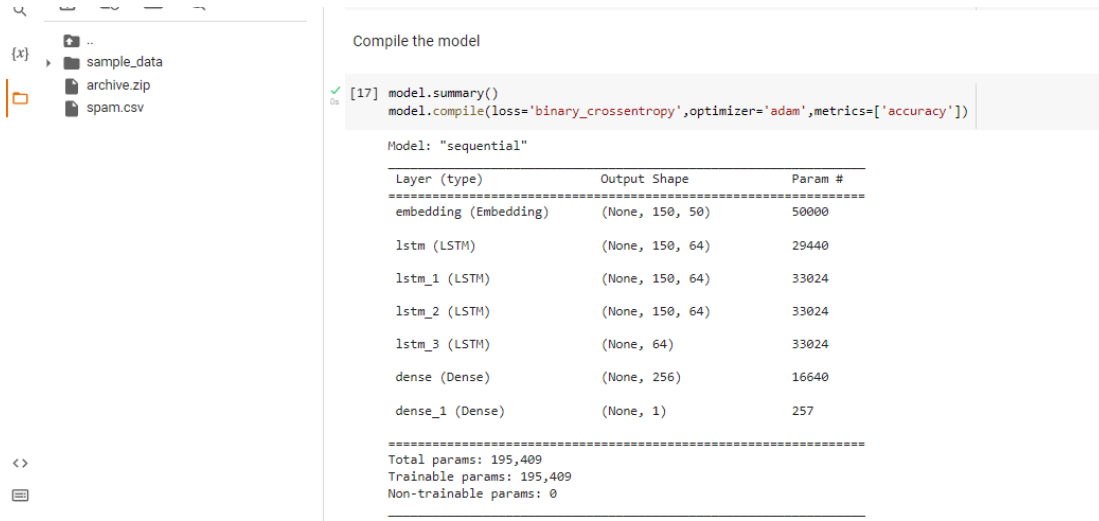


Question6:

Compilethemodel

Solution:

```
model.summary()model.compile(loss='binary_crossentropy',optimizer='adam',metrics=['a
ccuracy'])
```

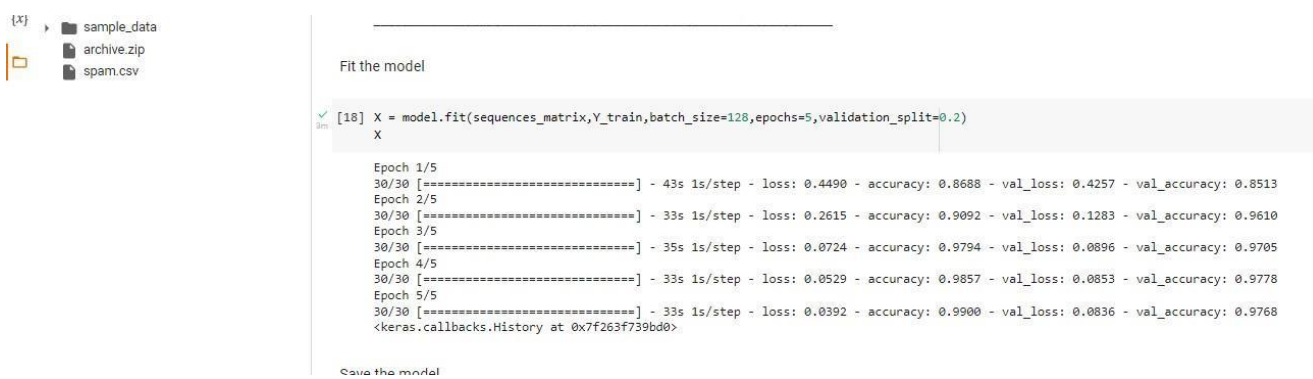


Question7:

Fitthemodel

Solution:

X=model.fit(sequences_matrix,Y_train,batch_size=128,epochs=5,validation_split=0.2)X

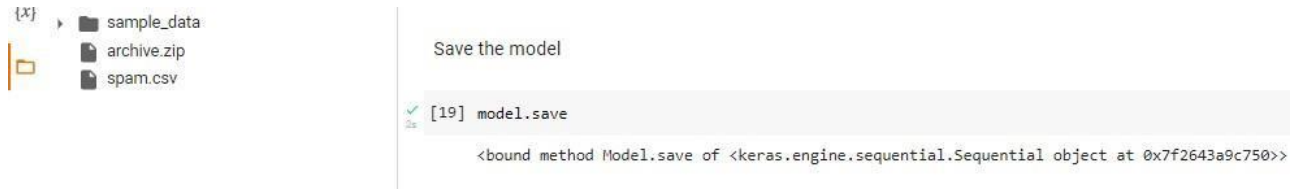


Question8:Sav

ethemodelSolu

tion:

model.save



Question9:

Testthemodel

Solution:

```
test_sequences=tok.texts_to_sequences(X_test)
test_sequences_matrix=utils.pad_sequences(test_sequences,maxlen=max_len)a

ccr=model.evaluate(test_sequences_matrix,Y_test)

l=accr[0]a
=accr[1]
print('Testset\nLoss:{:0.3f}\nAccuracy: {:0.3f}'.format(l,a))
```