Assignment-4
PythonProgramming

AssignmentDate	20 October 2022
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MaximumMarks	2Marks

Dataset

Question-1:

Importingthe dataset

Solution-1:

```
from google.colab import
drive
drive.mount('/content/drive'
)
```

Output:

```
Mountedat/content/drive
```

Solution-2:

```
dataset_location = "/content/drive/MyDrive/IBM/spam.csv"
```

Output:

```
/content/drive/MyDrive
```

Question-2

Load the dataset

Solution-1:

```
import pandas as
pdimport nltk
import re
import numpy as np
from nltk.corpus import stopwords
from nltk.stem.porter import PorterStemmer
from nltk.translate.ribes_score import word_rank_alignment
from numpy.lib.shape_base import split
from sklearn import preprocessing
from sklearn.feature_extraction.text import CountVectorizer
from tensorflow.keras.models import Sequential
from sklearn.model_selection import train_test_split
from keras.layers import LSTM,Dense,Dropout,Input,Embedding,Activation,Flatten
from keras.models import Model
import nltk
```

Output:

```
dataset import successfully
```

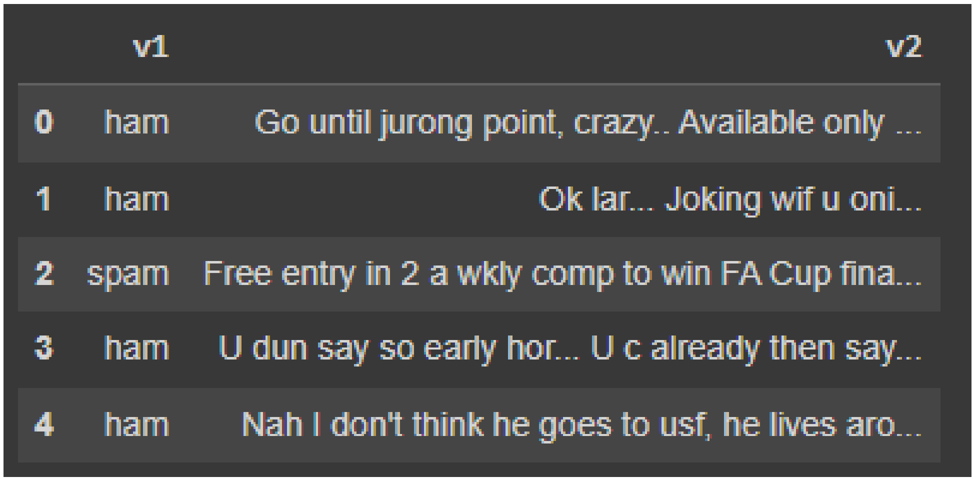
Question-3

Read dataset and do pre-processing

Solution:

```
data = pd.read_csv(dataset_location,encoding = "ISO-8859-1")
data.drop(["Unnamed: 2","Unnamed: 3","Unnamed: 4"],axis = 1,inplace = True)
data.head()
```

Output:



	v1	v2
0	ham	Go until jurong point, crazy.. Available only ...
1	ham	Ok lar... Joking wif u oni...
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...
3	ham	U dun say so early hor... U c already then say...
4	ham	Nah I don't think he goes to usf, he lives aro...

Solution-2:

```
nltk.download('stopwords',quiet=True)
nltk.download('all',quiet=True)
```

Output:

```
True
```

Solution-3:

```
ps =
PorterStemmer()
input = []
for i in range(0,5572):
 v2 = data['v2'][i]
 #removing
 punctuation
 v2 = re.sub('[^a-zA-Z]','
 ',v2)#converting to lower
 case v2 = v2.lower()
 #splitting the
 sentencev2 =
 v2.split()
#removing the stopwords and stemming
v2 = [ps.stem(word) for word in v2 if not word in set(stopwords.words('english'))]
v2 = ' '.join(v2)
input.append(v2)
#creating document term matrix
cv =
CountVectorizer(max_features=2000)x
= cv.fit_transform(input).toarray()
x.shape
```

Output:

```
(5572, 2000)
```

Solution-4:

```
le = preprocessing.LabelEncoder()
data['v1'] =
le.fit_transform(data['v1'])
data['v1'].unique()
```

Output:

```
array([0, 1])
```

Solution-5:

```
y =
data['v1'].valuesy
= y.reshape(-1,1)
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size = 0.4)
```

Output:

```
Successfully reshaped
```

Question-4:

Create model

Solution:

```
model = Sequential()
```

Output:

```
Model created successfully
```

Question-5:

5. Add layers (LSTM, Dense-(Hidden Layers), Output

Solution:

```
model.add(Dense(1565,activation =
"relu"))model.add(Dense(3000,activation
= "relu"))
model.add(Dense(1,activation =
"sigmoid"))model.add(Flatten())
```

Output:

```
Model added
```

Question-6:

Compile the model

Solution:

```
model.compile(optimizer = "adam",loss = "binary_crossentropy", metrics =
["accuracy"])
```

Output:

```
Model compiled
```

Question-7:

Fit the model

Solution:

```
model.fit(x_train,y_train,epochs = 15)
```

Output:

```
Model fit
```

Question-8:

Save the model

Solution:

```
model.save("spam-message-classifier.h5")
```

Output:

```
Model saved
```

Question-9:

Test the model

Solution:

```
ham = "imdonee. come pick me up"
spam = "WINNER$$$$ SMS REPLY
'WIN'"
message = re.sub('[^a-zA-Z]','
',spam)message
```

Output:

```
WINNER SMS REPLY WIN
```

Solution-2:

```
message = message.split()
message = [ps.stem(word) for word in message if not word in
set(stopwords.words('english')) ]
message = ' '.join(message)
message1 =
cv.transform([message])message1
```

Output:

```
<1x2000 sparse matrix of type '<class 'numpy.int64'>'
        with 4 stored elements in Compressed Sparse Row format>
```

Solution-3:

```
TruePredction = model.predict(message1.astype(float))
```

Output:

```
1/1 [==============================] - 0s 13ms/step
```

Solution-4:

```
TruePredction> 0.5
```

Output:

```
array([[ True]])
```

Solution-5:

```
TruePredction> 0.5
```

Output:

```
array([[ True]])
```

Solution-6:

```
msg = re.sub('[^a-zA-Z]','
',ham)msg
```

Output:

```
imdonee come pick me up
```

Solution-7:

```
msg = msg.split()
msg = [ps.stem(word) for word in msg if not word in
set(stopwords.words('english'))]msg = ' '.join(msg)
msg
```

Output:

```
im done come pick
```

Solution-8:

```
cv.transform([msg])
```

Output:

```
<1x2000 sparse matrix of type '<class 'numpy.int64'>' with 4 stored elements in
Compressed Sparse Row format>
```

Solution-9:

```
FalsePredection = model.predict(cv.transform([msg]))
```

Output:

```
1/1 [==============================] - 0s 110ms/step
```

Solution-10:

```
FalsePredection> 0.5
```

Output:

```
array([[False]])
```