Assignment-IV

Natural Disasters Intensity Analysis And Classification

Date	1 November 2022
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Maximum marks	2 marks

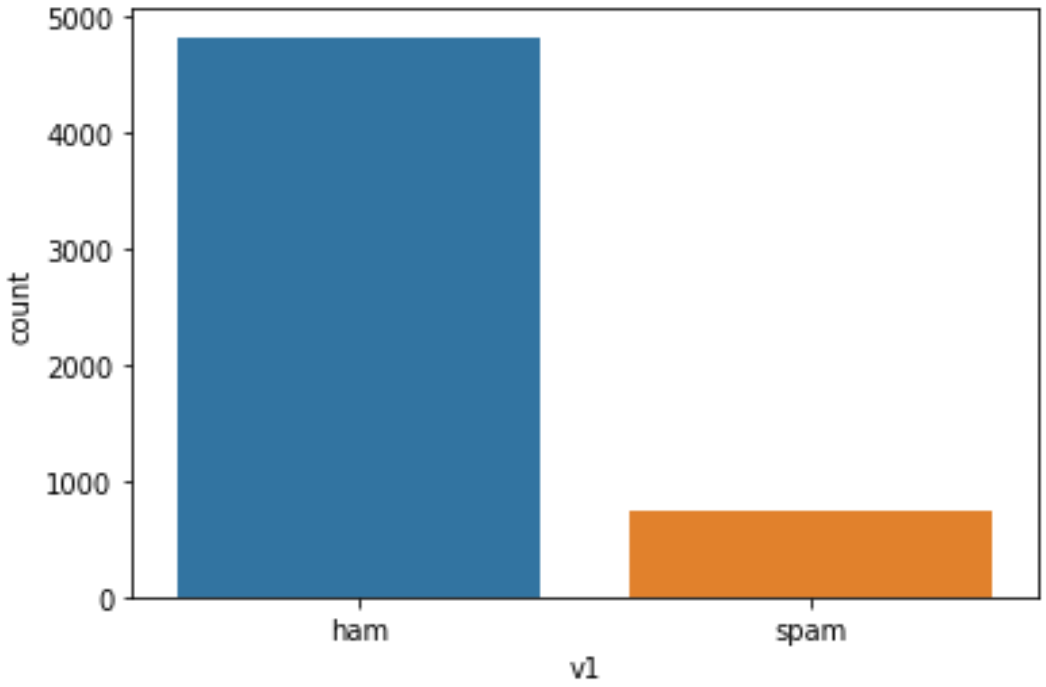
```
import pandas as pd  import numpy as np  import
matplotlib.pyplot as plt  import seaborn as sns  from
sklearn.model_selection import train_test_split  from
sklearn.preprocessing import LabelEncoder from
tensorflow.keras.models import Model
from tensorflow.keras.layers import LSTM,Activation, Dense, Dropout,
Input, Embedding  from tensorflow.keras.optimizers import RMSprop  from
tensorflow.keras.preprocessing.text import Tokenizer  from
tensorflow.keras.preprocessing import sequence  from tensorflow.keras.utils
import to_categorical  from tensorflow.keras.callbacks import EarlyStopping
%matplotlib    inline    import    csv       with
open('/spam.csv', 'r') as csvfile:   reader
= csv.reader(csvfile) df =
pd.read_csv(r'/spam.csv',encoding='latin-1') df.head()
```

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

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

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5572 entries, 0 to 5571
Data columns (total 2 columns):
```

```
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   v1      5572 non-null   object  1
v2      5572 non-null   object dtypes:
object(2) memory usage:
87.2+ KB sns.countplot(df.v1)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.   FutureWarning
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f5197dac250>
```




```
X = df.v2 Y = df.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=0.20)  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 =
sequence.pad_sequences(sequences,maxlen=max_len)
```

```
def RNN():
    inputs = Input(name='inputs',shape=[max_len])      layer =
Embedding(max_words,50,input_length=max_len)(inputs)
```

```
layer = LSTM(128)(layer)    layer =
Dense(256,name='FC1')(layer)    layer =
Activation('relu')(layer)    layer = Dropout(0.5)(layer)    layer
= Dense(1,name='out_layer')(layer)    layer =
Activation('tanh')(layer)    model =
Model(inputs=inputs,outputs=layer)    return model

model = RNN() model.summary()
model.compile(loss='binary_crossentropy',optimizer=RMSprop(),metrics=['accura
cy','mse','mae'])
```

```
Model: "model"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
inputs (InputLayer)         [(None, 150)]             0
embedding (Embedding)       (None, 150, 50)           50000
                                                  lstm (LSTM)                 (None, 128)
                                                                                91648

 FC1 (Dense)                 (None, 256)               33024

activation (Activation)     (None, 256)               0
dropout (Dropout)           (None, 256)               0

         out_layer (Dense)           (None, 1)                 257
         activation_1 (Activation)   (None, 1)                 0

=================================================================
Total params: 174,929
Trainable params: 174,929
Non-trainable params: 0
_________________________________________________________________
```

```
model.fit(sequences_matrix,Y_train,batch_size=128,epochs=10,

validation_split=0.2,callbacks=[EarlyStopping(monitor='val_loss',min_delta=0.
0001)])
```

```
Epoch 1/10
28/28 [==============================] - 17s 486ms/step - loss: 0.2960 -
accuracy: 0.8819 - mse: 0.0821 - mae: 0.1563 - val_loss: 0.1341 -
val_accuracy: 0.9675 - val_mse: 0.0344 - val_mae: 0.1237 Epoch 2/10  28/28
[==============================] - 13s 462ms/step - loss: 0.1149 -
accuracy: 0.9764 - mse: 0.0381 - mae: 0.1538 - val_loss: 0.1321 -
val_accuracy: 0.9798 - val_mse: 0.0437 - val_mae: 0.1695
```

```
<keras.callbacks.History at 0x7f5193192590> test_sequences =
tok.texts_to_sequences(X_test) test_sequences_matrix =
sequence.pad_sequences(test_sequences,maxlen=max_len) accr =
model.evaluate(test_sequences_matrix,Y_test)
35/35 [==============================] - 3s 78ms/step - loss: 0.1590 -
accuracy: 0.9812 - mse: 0.0451 - mae: 0.1733


print('Test set\n  Loss: {:0.3f}\n  Accuracy:
{:0.3f}'.format(accr[0],accr[1]))
Test set
  Loss:     0.159             Accuracy:     0.981
model.save("./assign4model.h5")              from
tensorflow.keras.models import load_model m2
= load_model("./assign4model.h5")
m2.evaluate(test_sequences_matrix,Y_test)
35/35 [==============================] - 3s 68ms/step - loss: 0.1590 -
accuracy: 0.9812 - mse: 0.0451 - mae: 0.1733
[0.1589982509613037,
 0.9811659455299377,
 0.04506031796336174,
 0.17333826422691345]
```