Assignment - 4

Date	31 10-2022
Team ID	PNT2022TMID37915
Project Name	AI-power Nutrition Analyzer for fitness enthusiasts

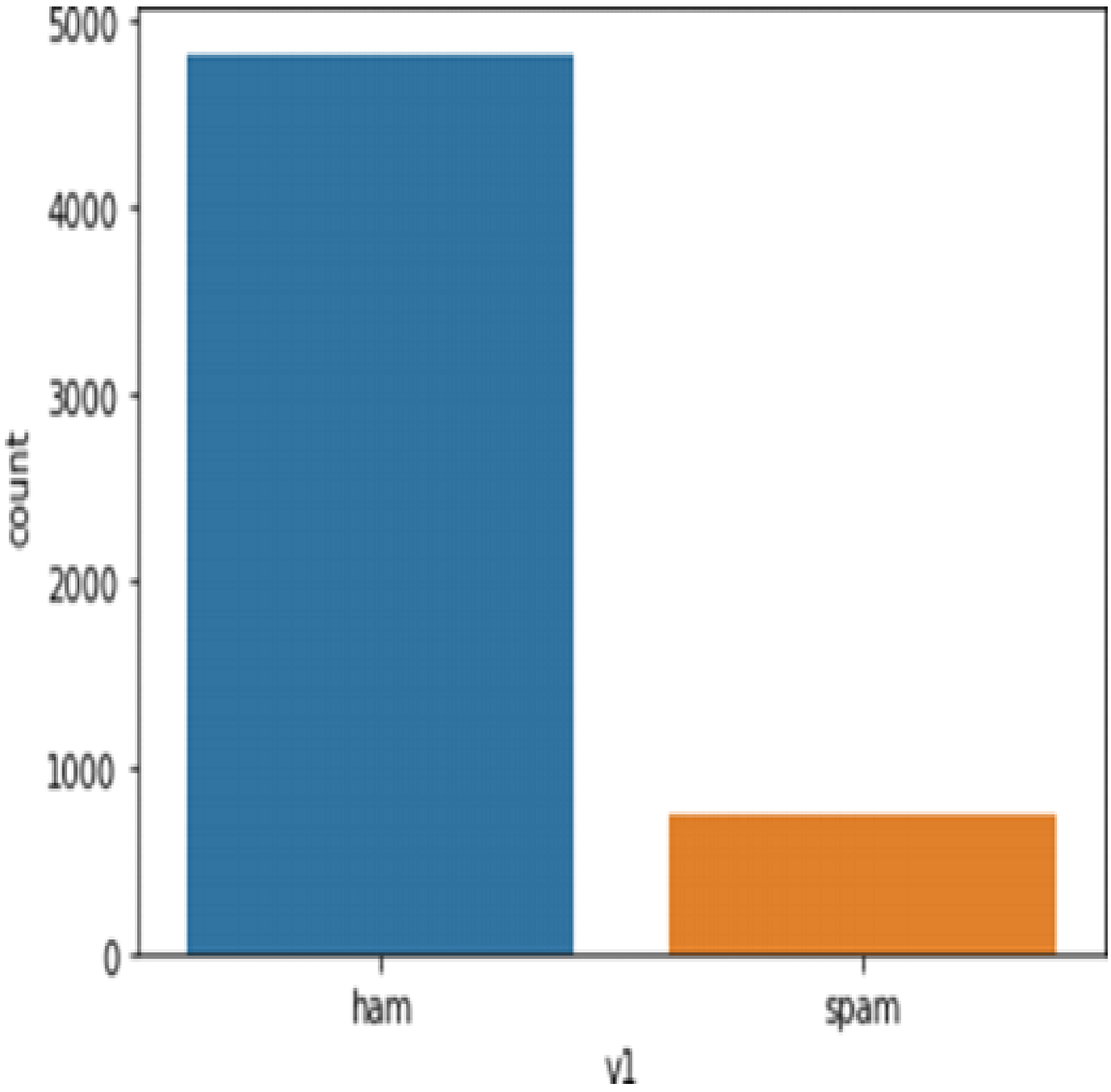
```
import pandas as pd import numpy
as np
import matplotlib.pyplot as plt import seaborn as sns
from sklearn.model_selection import train_test_split from
sklearn.preprocessing import LabelEncoder from
tensorflow.keras.models import Model
from tensorflow.keras.layers import LSTM,Activation, Dense, Dropout, 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        Na         NaN
         N
3        Na         NaN
         N
4        Na         NaN
         N
```

```
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



```
<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]
```