# Assignment-4 PythonProgramming

AssignmentDate	20October 2022
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MaximumMarks	2Marks

#### **Dataset**

#### Question-1:

Importing the 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 pd

import 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

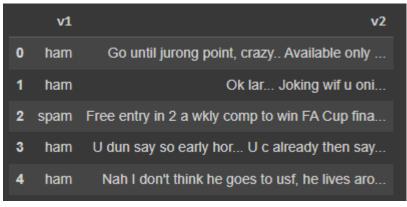
## **Question-3**

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:**



#### 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 sentence
 v2 = 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'].values
y = 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

```
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>
```

Question-6:

```
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>
```

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