Assignment -4

SMS SPAM Classification

Assignment Date	08 NOVEMBER 2022
Team id	PNT2022TMID46647
Maximum Marks	2 Marks

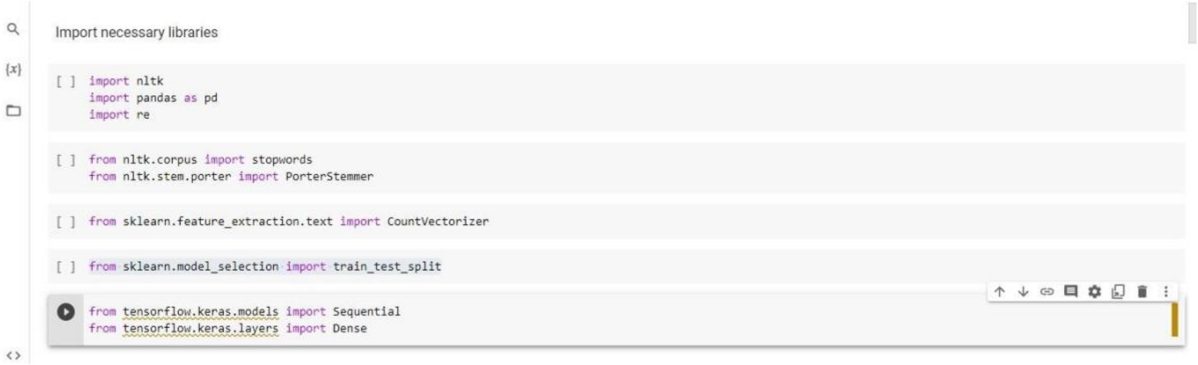
Question-1:

Download the dataset

Question-2:

Import required library

Solution import nltk
import pandas as pd
import re
from nltk.corpus import stopwords from nltk.stem.porter
import PorterStemmer from sklearn.feature_extraction.text
import CountVectorizer from sklearn.model_selection import
train_test_split from tensorflow.keras.models import
Sequential from tensorflow.keras.layers import Dense



Import necessary libraries

```
[ ] import nltk
    import pandas as pd
    import re
```

```
[ ] from nltk.corpus import stopwords
    from nltk.stem.porter import PorterStemmer
```

```
[ ] from sklearn.feature_extraction.text import CountVectorizer
```

```
[ ] from sklearn.model_selection import train_test_split
```

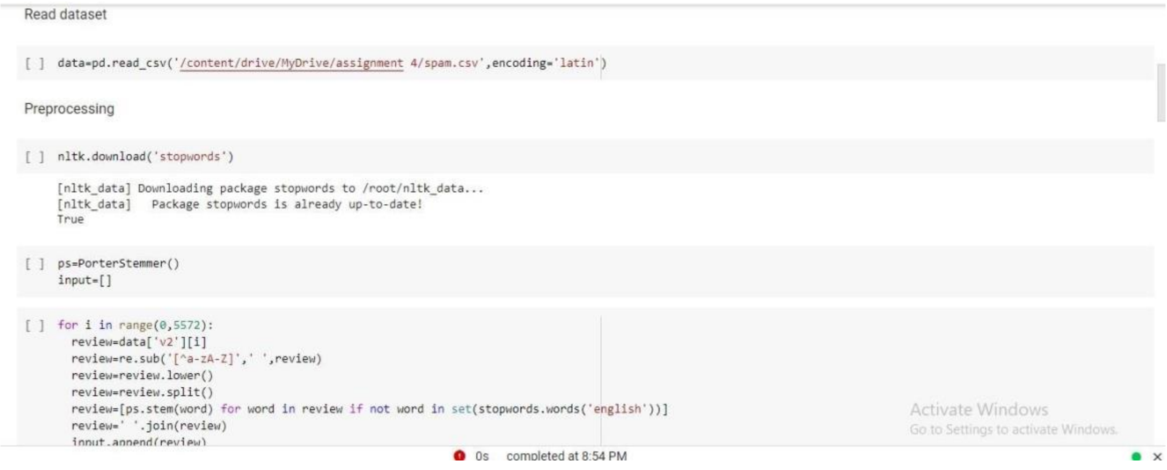
```
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense
```

Question-3:

Read dataset and do pre-processing

Solution

data=pd.read_csv('/content/drive/MyDrive/assignment 4/spam.csv',encoding='latin') nltk.download('stopwords') ps=PorterStemmer() input=[] for i in range(0,5572): review=data['v2'][i] review=re.sub('[^a-zA-Z]',' ',review) review=review.lower() review=review.split() review=[ps.stem(word) for word in review if not word in set(stopwords.words('english'))] review=' '.join(review) input.append(review) cv=CountVectorizer(max_features=7000) x=cv.fit_transform(input).toarray() y=data['v1'].values x_train,x_test,y_train,y_test= train_test_split(x,y,test_size=0.2)



Read dataset

```
[ ] data=pd.read_csv('/content/drive/MyDrive/assignment 4/spam.csv',encoding='latin')
```

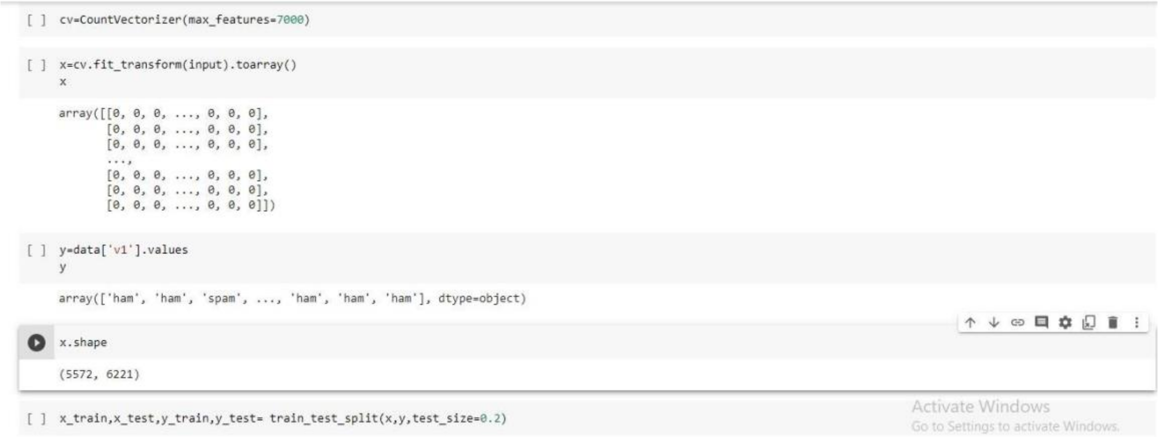
Preprocessing

```
[ ] nltk.download('stopwords')

    [nltk_data] Downloading package stopwords to /root/nltk_data...
    [nltk_data]   Package stopwords is already up-to-date!
    True

[ ] ps=PorterStemmer()
    input=[]

[ ] for i in range(0,5572):
      review=data['v2'][i]
      review=re.sub('[^a-zA-Z]',' ',review)
      review=review.lower()
      review=review.split()
      review=[ps.stem(word) for word in review if not word in set(stopwords.words('english'))]
      review=' '.join(review)
      input.append(review)
```



```
[ ] cv=CountVectorizer(max_features=7000)

[ ] x=cv.fit_transform(input).toarray()
    x

    array([[0, 0, 0, ..., 0, 0, 0],
           [0, 0, 0, ..., 0, 0, 0],
           [0, 0, 0, ..., 0, 0, 0],
           ...,
           [0, 0, 0, ..., 0, 0, 0],
           [0, 0, 0, ..., 0, 0, 0],
           [0, 0, 0, ..., 0, 0, 0]])

[ ] y=data['v1'].values
    y

    array(['ham', 'ham', 'spam', ..., 'ham', 'ham', 'ham'], dtype=object)

    x.shape

    (5572, 6221)

[ ] x_train,x_test,y_train,y_test= train_test_split(x,y,test_size=0.2)
```

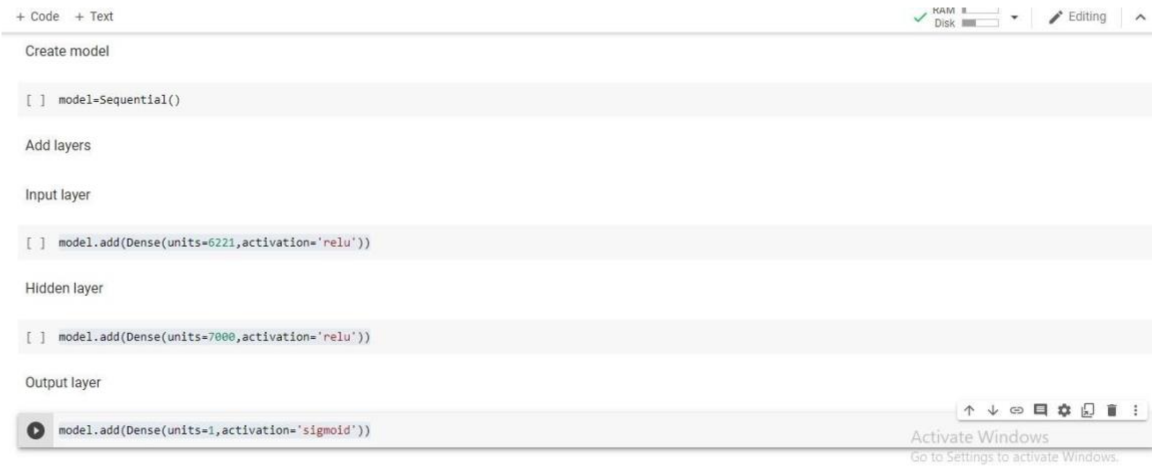
Question-4:

Create Model

Solution model=Sequential()

Question-5:

Add Layers (LSTM, Dense-(Hidden Layers), Output) **Solution**
model.add(Dense(units=6221,activation='relu'))
model.add(Dense(units=7000,activation='relu'))
model.add(Dense(units=1,activation='sigmoid'))



Create model

```
[ ] model=Sequential()
```

Add layers

Input layer

```
[ ] model.add(Dense(units=6221,activation='relu'))
```

Hidden layer

```
[ ] model.add(Dense(units=7000,activation='relu'))
```

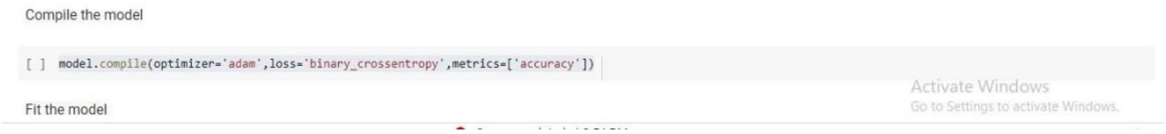
Output layer

```
model.add(Dense(units=1,activation='sigmoid'))
```

Question-6:

Compile The Model **Solution**

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



Compile the model

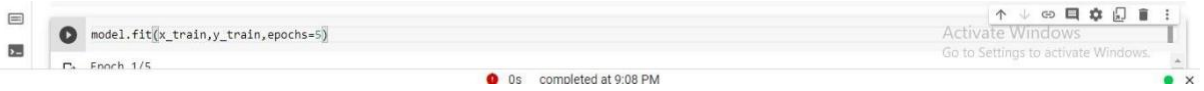
```
[ ] model.compile(optimizer='adam',loss='binary_crossentropy',metrics=['accuracy'])
```

Fit the model

Question-7:

Fit The Model **Solution**

model.fit(x_train,y_train,epochs=5
)



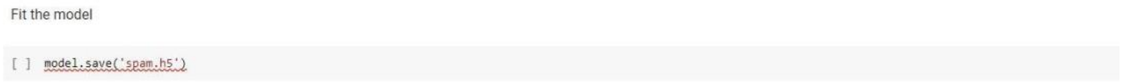
```
model.fit(x_train,y_train,epochs=5)
Epoch 1/5
```

Question-7:

Save The Model

Solution

model.save("Flowers.h5"
)



Fit the model

```
[ ] model.save('spam.h5')
```