Assignment -4

SMS SPAM Classification

Assignment Date	22 October 2022
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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
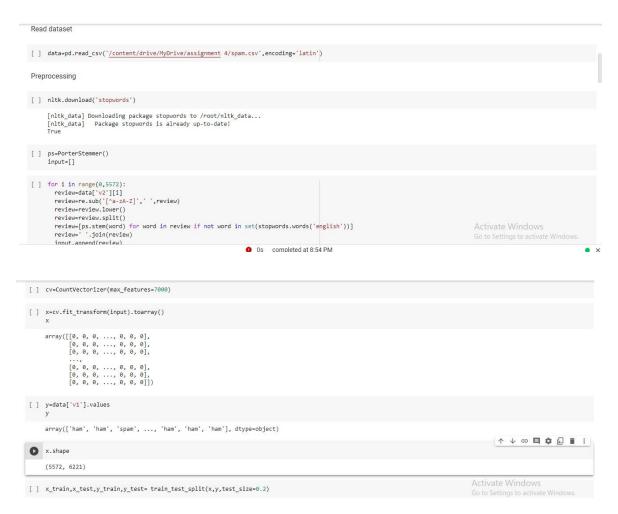Sequential from tensorflow.keras.layers import Dense

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)
```

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```
[ ]  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
```
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Question-7:

Save The Model

Solution
model.save("Flowers.h5")

Fit the model

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