

▼ 1. Import required library

```
import pandas as pd
import numpy as np
import nltk
import re

nltk.download('stopwords')
from nltk.corpus import stopwords
from nltk.stem.porter import PorterStemmer
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.preprocessing import LabelEncoder

[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
```

▼ 2. Read dataset and do pre-processing

```
df=pd.read_csv('/content/spam.csv',encoding="ISO-8859-1")
df
```

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

```

port=PorterStemmer()
cv = CountVectorizer()
dataset=[]

for i in range(0,len(df)):
    review = df['v2'][i] # Reading data
    review = re.sub('[^a-zA-Z]', ' ', review) # Removing special character
    review = review.lower() # Convert capital letters into small letters
    review = review.split() # Split the input
    review = [port.stem(w) for w in review if w not in set(stopwords.words('english'))] # Stemming & Stopwords
    review = ' '.join(review) # join words
    dataset.append(review)

```

dataset

```

['go jurong point crazi avail bugi n great world la e buffet cine got amor wat',
'ok lar joke wif u oni',
'free entri wkli comp win fa cup final tkt st may text fa receiv entri question std txt rate c appli',
'u dun say earli hor u c already say',
'nah think goe usf live around though',
'freemsg hey darl week word back like fun still tb ok xxx std chg send rcv',
'even brother like speak treat like aid patent',
'per request mell mell oru minnaminungint nurungu vettam set callertun caller press copi friend callertun',
'winner valu network custom select receivea prize reward claim call claim code kl valid hour',
'mobil month u r entitl updat latest colour mobil camera free call mobil updat co free',

```

'gonna home soon want talk stuff anymor tonight k cri enough today',
'six chanc win cash pound txt csh send cost p day day tsandc appli repli hl info',
'urgent week free membership prize jackpot txt word claim c www dbuk net lccltd pobox ldnw rw',
'search right word thank breather promis wont take help grant fulfil promis wonder bless time',
'date sunday',
'xxxmobilemovieclub use credit click wap link next txt messag click http wap xxxmobilemovieclub com n qjkgighjjgcb1',
'oh k watch',
'eh u rememb spell name ye v naughti make v wet',
'fine way u feel way gota b',
'england v macedonia dont miss goal team news txt ur nation team eg england tri wale scotland txt poboxox w wq',
'serious spell name',
'go tri month ha ha joke',
'pay first lar da stock comin',
'aft finish lunch go str lor ard smth lor u finish ur lunch already',
'ffffffffffff alright way meet sooner',
'forc eat slice realli hungri tho suck mark get worri know sick turn pizza lol',
'lol alway convinc',
'catch bu fri egg make tea eat mom left dinner feel love',
'back amp pack car let know room',
'ahhh work vagu rememb feel like lol',
'wait still clear sure sarcast x want live us',
'yeah got v apologet n fallen actin like spoilt child got caught till go badli cheer',
'k tell anyth',
'fear faint housework quick cuppa',
'thank subscript rington uk mobil charg month pleas confirm repli ye repli charg',
'yup ok go home look time msg xuhui go learn nd may lesson',
'oop let know roommat done',
'see letter b car',
'anyth lor u decid',
'hello saturday go text see decid anyth tomo tri invit anyth',
'pl go ahead watt want sure great weekend abiola',
'forget tell want need crave love sweet arabian steed mmmmmm yummi',
'rodger burn msg tri call repli sm free nokia mobil free camcord pleas call deliveri tomorrow',
'see',
'great hope like man well endow lt gt inch',
'call messag miss call',
'get hep b immunis nigeria',
'fair enough anyth go',
'yeah hope tyler could mayb ask around bit',
'u know stubborn even want go hospit kept tell mark weak sucker hospit weak sucker',
'think first time saw class',


```
model = Sequential()  
model.add(Dense(1500, activation='relu'))  
model.add(Dense(3000, activation='relu'))  
model.add(Dense(1, activation='sigmoid'))
```

▼ 5. Compile the Model

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

▼ 6. Fit the Model

```
model.fit(x,y, epochs=10)
```

```
Epoch 1/10  
175/175 [=====] - 2s 6ms/step - loss: 0.1188 - accuracy: 0.9684  
Epoch 2/10  
175/175 [=====] - 1s 6ms/step - loss: 0.0113 - accuracy: 0.9975  
Epoch 3/10  
175/175 [=====] - 1s 6ms/step - loss: 0.0018 - accuracy: 0.9995  
Epoch 4/10  
175/175 [=====] - 1s 6ms/step - loss: 4.5578e-04 - accuracy: 0.9998  
Epoch 5/10  
175/175 [=====] - 1s 6ms/step - loss: 1.3397e-04 - accuracy: 1.0000  
Epoch 6/10  
175/175 [=====] - 1s 6ms/step - loss: 6.3747e-05 - accuracy: 1.0000  
Epoch 7/10  
175/175 [=====] - 1s 6ms/step - loss: 3.7938e-05 - accuracy: 1.0000  
Epoch 8/10  
175/175 [=====] - 1s 6ms/step - loss: 2.4956e-05 - accuracy: 1.0000  
Epoch 9/10  
175/175 [=====] - 1s 6ms/step - loss: 1.7525e-05 - accuracy: 1.0000  
Epoch 10/10
```

175/175 [=====] - 1s 6ms/step - loss: 1.2765e-05 - accuracy: 1.0000

▼ 7. Save The Model

```
model.save('nlp.h5')
```

▼ 8. Test the Model

```
# Test 1
```

```
text = 'Go until jurong point, crazy.. Available only in bugis n great world la e buffet... Cine there got amore wat...'
print(text + "\n")
text = re.sub('[^a-zA-Z]', ' ', text)
text = text.lower()
text = text.split()
text = [port.stem(w) for w in text if w not in set(stopwords.words('english'))]
text = ' '.join(text)
text = cv.transform([text]).toarray()
pred = model.predict(text)
print("\nResult : ", end="")
if pred>0.5:
    print('Spam')
else: print('Ham')
```

Go until jurong point, crazy.. Available only in bugis n great world la e buffet... Cine there got amore wat...

1/1 [=====] - 0s 18ms/step

Result : Ham

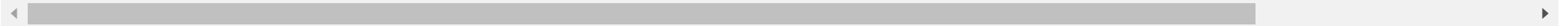
```
# Test 1
```

```
text = 'England v Macedonia - dont miss the goals/team news. Txt ur national team to 87077 eg ENGLAND to 87077 Try:WALES, SCOTLAND 4t
print(text + "\n")
text = re.sub('[^a-zA-Z]', ' ', text)
text = text.lower()
text = text.split()
text = [port.stem(w) for w in text if w not in set(stopwords.words('english'))]
text = ' '.join(text)
text = cv.transform([text]).toarray()
pred = model.predict(text)
print("\nResult : ",end="")
if pred>0.5:
    print('Spam')
else: print('Ham')
```

England v Macedonia - dont miss the goals/team news. Txt ur national team to 87077 eg ENGLAND to 87077 Try:WALES, SCOTLAND 4txt

1/1 [=====] - 0s 14ms/step

Result : Spam



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✓ 0s completed at 8:07 PM

