```
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
```

```
data=pd.read_csv('spam.csv',encoding=('ISO-8859-1'))
data
```

	Category	Message	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
...	...	...	...	...	...
5567	spam	This is the 2nd time we have tried 2 contact u...	NaN	NaN	NaN
5568	ham	Will Ì_ b going to esplanade fr home?	NaN	NaN	NaN
5569	ham	Pity, * was in mood for that. So...any other s...	NaN	NaN	NaN
5570	ham	The guy did some bitching but I acted like i'd...	NaN	NaN	NaN
5571	ham	Rofl. Its true to its name	NaN	NaN	NaN

5572 rows × 5 columns

```
data.columns
```

```
Index(['Category', 'Message', 'Unnamed: 2', 'Unnamed: 3', 'Unnamed: 4'], dtype='object')
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5572 entries, 0 to 5571
Data columns (total 5 columns):
 #   Column      Non-Null Count  Dtype 
---  ------      --------------  ----- 
 0   Category    5572 non-null   object
 1   Message     5572 non-null   object
 2   Unnamed: 2  50 non-null     object
 3   Unnamed: 3  12 non-null     object
 4   Unnamed: 4  6 non-null      object
dtypes: object(5)
memory usage: 217.8+ KB
```

Dropped The Column Unnamed: 0

```
data.isna().sum()
```

```
Category         0
Message          0
Unnamed: 2    5522
Unnamed: 3    5560
Unnamed: 4    5566
dtype: int64
```

```
data['Spam']=data['Category'].apply(lambda x:1 if x=='spam' else 0)
data.head(5)
```

	Category	Message	Unnamed: 2	Unnamed: 3	Unnamed: 4	Spam
0	ham	Go until jurong point, crazy.. Available only ...	NaN	NaN	NaN	0
1	ham	Ok lar... Joking wif u oni...	NaN	NaN	NaN	0
2	spam	Free entry in 2 a wkly comp to win FA Cup fina...	NaN	NaN	NaN	1
3	ham	U dun say so early hor... U c already then say...	NaN	NaN	NaN	0

```
from sklearn.model_selection import train_test_split
X_train,X_test,y_train,y_test=train_test_split(data.Message,data.Spam,test_size=0.25)
```

```
#CounterVectorizer Convert the text into matrics
from sklearn.feature_extraction.text import CountVectorizer
```

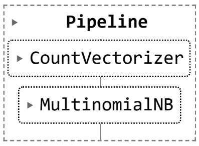
Naive Bayes Have three Classifier(Bernouli,Multinominal,Gaussian) Here I use Multinominal Bayes Because here data in a discrete form discrete data(e.g movie ratings ranging 1 to 5 as each rating will have certain frequency to represent)

```
from sklearn.naive_bayes import MultinomialNB
```

```
from sklearn.pipeline import Pipeline
clf=Pipeline([
    ('vectorizer',CountVectorizer()),
    ('nb',MultinomialNB())
])
```

Tarining The Model

```
clf.fit(X_train,y_train)
```



Here I given Two email Two detect 1st One is looking good and the other one looking spam

```
emails=[
    'Sounds great! Are you home now?',
    'Will u meet ur dream partner soon? Is ur career off 2 a flyng start? 2 find out free, txt HORO followed by ur star sign, e. g. HORO
]
```

Predict Email

```
clf.predict(emails)
```

```
array([0, 1])
```

Prediction Of Model

```
clf.score(X_test,y_test)
```

```
0.990667623833453
```

✓ 0s completed at 11:17 PM ● ×