Chapter 4: Demo

In [1]:
```
### Stolen car: Red, SUV, Domestic => stolen Yes or No???
```

In [2]:
```
import numpy as np
import pandas as pd
```

In [3]:
```
X = np.array([["Red", "Sports", "Domestic"],
              ["Red", "Sports", "Domestic"],
              ["Red", "Sports", "Domestic"],
              ["Yellow", "Sports", "Domestic"],
              ["Yellow", "Sports", "Imported"],
              ["Yellow", "SUV", "Imported"],
              ["Yellow", "SUV", "Imported"],
              ["Yellow", "SUV", "Domestic"],
              ["Red", "SUV", "Imported"],
              ["Red", "Sports", "Imported"]])
Y = np.array(["Yes", "No", "Yes", "No", "Yes", "No", "Yes", "No", "No", "Yes"])
```

In [4]:
```
X = pd.DataFrame(X, columns = ['color', 'type', 'origin'])
X_now = pd.get_dummies(X)
X_now
```

Out[4]:

	color_Red	color_Yellow	type_SUV	type_Sports	origin_Domestic	origin_Imported
0	1	0	0	1	1	0
1	1	0	0	1	1	0
2	1	0	0	1	1	0
3	0	1	0	1	1	0
4	0	1	0	1	0	1
5	0	1	1	0	0	1
6	0	1	1	0	0	1
7	0	1	1	0	1	0
8	1	0	1	0	0	1
9	1	0	0	1	0	1

In [5]:
```
Y = pd.DataFrame(Y, columns = ['stolen'])
Y_now = pd.get_dummies(Y, drop_first=True)
Y_now
```

Out[5]:

	stolen_Yes
0	1
1	0
2	1
3	0
4	1
5	0
6	1
7	0
8	0
9	1

In [6]:
```
# Sử dụng BernoulliNB
# https://scikit-learn.org/stable/modules/generated/sklearn.naive_bayes.Bernoull
from sklearn.naive_bayes import BernoulliNB
clf = BernoulliNB()
clf.fit(X_now, Y_now)
```

```
c:\program files\python36\lib\site-packages\sklearn\utils\validation.py:724: Da
taConversionWarning: A column-vector y was passed when a 1d array was expected.
Please change the shape of y to (n_samples, ), for example using ravel().
  y = column_or_1d(y, warn=True)
```

Out[6]:
```
BernoulliNB(alpha=1.0, binarize=0.0, class_prior=None, fit_prior=True)
```

In [7]:
```
X_new = [[1,0,1,0,1,0]] #"Red", "SUV", "Domestic"
```

In [8]:
```
#Predict Output
predicted= clf.predict(X_new) # Red, SUV, Domestic
predicted
```

Out[8]:
```
array([0], dtype=uint8)
```

In [9]:
```
#Create a Gaussian Classifier
# https://scikit-learn.org/stable/modules/generated/sklearn.naive_bayes.GaussianN
from sklearn.naive_bayes import GaussianNB
model = GaussianNB()

# Train the model using the training sets
model.fit(X_now, Y_now)
```

```
c:\program files\python36\lib\site-packages\sklearn\utils\validation.py:724: Da
taConversionWarning: A column-vector y was passed when a 1d array was expected.
Please change the shape of y to (n_samples, ), for example using ravel().
  y = column_or_1d(y, warn=True)
```

Out[9]:
```
GaussianNB(priors=None, var_smoothing=1e-09)
```

In [10]:
```
#Predict Output
predicted= model.predict(X_new)
predicted
```

Out[10]:
```
array([0], dtype=uint8)
```