Ex1: Evade

Cho dữ liệu evade trong tập tin evade.xlsx.

Yêu cầu: Hãy đọc dữ liệu từ tập tin này, áp dụng Naive Bayes để thực hiện việc xác định có evade hay không dựa trên các thông tin như: 'Refund', 'Marital Status', 'Taxable Income'

Cho dữ liệu Test:

X_test = [["No", "Married", 120000],["Yes","Divorce",25000]]

Yêu cầu:

1. Hãy chuẩn hóa dữ liệu cho phù hợp
2. Áp dụng Naive Bayes. Tìm kết quả Y1 (Y test)
3. Kiểm tra độ chính xác

In [0]:
```
import pandas as pd
```

In [0]:
```
df = pd.read_excel('evade.xlsx', index_col = 0)
df
```

Out[0]:

Tid	Refund	Marital_Status	Taxable_Income	Evade
1	1	0	125000	0
2	0	1	100000	0
3	0	0	70000	0
4	1	1	120000	0
5	0	2	95000	1
6	0	1	60000	0
7	1	2	220000	0
8	0	0	85000	1
9	0	1	75000	0
10	0	0	90000	1

In [0]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 10 entries, 1 to 10
Data columns (total 4 columns):
Refund           10 non-null int64
Marital_Status   10 non-null int64
Taxable_Income   10 non-null int64
Evade            10 non-null int64
dtypes: int64(4)
memory usage: 400.0 bytes
```

In [0]:
```
features = df[["Refund","Marital_Status","Taxable_Income"]]
target = df[["Evade"]]
```

In [0]:
```
#features
```

In [0]:
```
#target
```

In [0]:
```
from sklearn.naive_bayes import GaussianNB
import numpy as np
from sklearn.utils.validation import column_or_1d
#Create a Gaussian Classifier
model = GaussianNB()
# Train the model using the training sets
model.fit(features, column_or_1d(target))
```

Out[0]:
```
GaussianNB(priors=None, var_smoothing=1e-09)
```

In [0]:
```
import numpy as np
# Kiểm tra độ chính xác
print("The prediction accuracy is: ",
      model.score(features,np.array(target))*100,"%")
```

```
The prediction accuracy is:  100.0 %
```

In [0]:
```
class_names = model.classes_
class_names
```

Out[0]:
```
array([0, 1], dtype=int64)
```

In [0]:
```
# X_test = [["No", "Married", 120000],["No","Single",90000]]
X_test = [[0, 1, 120000], [0, 0, 90000]]
y_pred = model.predict(X_test)
y_pred
```

Out[0]:
```
array([0, 1], dtype=int64)
```

In [0]:
```
import pickle
# Save to file in the current working directory
pkl_filename = "pickle_model.pkl"
with open(pkl_filename, 'wb') as file:
    pickle.dump(model, file)
```

In [0]:
```
with open(pkl_filename, 'rb') as file:
    pickle_model = pickle.load(file)
```

In [0]:
```
X_test = [[0, 0, 75000]]
y_pred = pickle_model.predict(X_test)
y_pred
```

Out[0]:
```
array([0], dtype=int64)
```

In [0]:
```

```