

Experiment No. 3

Code:

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LogisticRegression
from sklearn import preprocessing
from sklearn.metrics import confusion_matrix
import matplotlib.pyplot as plt

df = pd.read_csv('ChurnData.csv')
df = df[['tenure', 'age', 'address', 'income', 'ed', 'employ', 'equip','churn']]
df['churn'] = df['churn'].astype('int')

X = np.asarray(df[['tenure', 'age', 'address', 'income', 'ed', 'employ', 'equip']])
y = np.asarray(df['churn'])
X_train, X_test, y_train, y_test = train_test_split( X, y, test_size=0.2)

X = preprocessing.StandardScaler().fit(X).transform(X)

LR = LogisticRegression().fit(X_train,y_train)
y_pred = LR.predict(X_test)

cnf_matrix = confusion_matrix(y_test, y_pred, labels=[1,0])
print("Confusion Matrix\n",cnf_matrix)

cmap=plt.cm.Blues
plt.imshow(cnf_matrix, interpolation='nearest', cmap=cmap)
plt.title("Confusion Matrix")
plt.colorbar()
tick_marks = np.arange(len(['churn=1','churn=0']))
plt.xticks(tick_marks,['churn=1','churn=0'], rotation=45)
plt.yticks(tick_marks, ['churn=1','churn=0'])
plt.tight_layout()
plt.ylabel('True label')
plt.xlabel('Predicted label')
plt.show()
```

Output:

```
C:\Windows\System32\cmd.exe

D:\Study\Introduction to Machine Learning\Programs>python LogisticRegression.py
Confusion Matrix
[[ 7  6]
 [ 2 25]]
```

