**PRACTICAL NO.9**

**9. Write a program to implement Naive Bayes algorithm.**

# Naive Bayes

# Importing the libraries

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

# Importing the dataset

dataset = pd.read\_csv('Social\_Network\_Ads.csv')

X = dataset.iloc[:, [2, 3]].values

y = dataset.iloc[:, 4].values

# Splitting the dataset into the Training set and Test set

from sklearn.model\_selection import train\_test\_split

X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size = 0.25, random\_state = 0)

# Feature Scaling

from sklearn.preprocessing import StandardScaler

sc = StandardScaler()

X\_train = sc.fit\_transform(X\_train)

X\_test = sc.transform(X\_test)

# Fitting Naive Bayes to the Training set

from sklearn.naive\_bayes import GaussianNB

classifier = GaussianNB()

classifier.fit(X\_train, y\_train)

# Predicting the Test set results

y\_pred = classifier.predict(X\_test)

# Making the Confusion Matrix

from sklearn.metrics import confusion\_matrix

cm = confusion\_matrix(y\_test, y\_pred)

# Visualising the Training set results

from matplotlib.colors import ListedColormap

X\_set, y\_set = X\_train, y\_train

X1, X2 = np.meshgrid(np.arange(start = X\_set[:, 0].min() - 1, stop = X\_set[:, 0].max() + 1, step = 0.01),

np.arange(start = X\_set[:, 1].min() - 1, stop = X\_set[:, 1].max() + 1, step = 0.01))

plt.contourf(X1, X2, classifier.predict(np.array([X1.ravel(), X2.ravel()]).T).reshape(X1.shape),

alpha = 0.75, cmap = ListedColormap(('red', 'green')))

plt.xlim(X1.min(), X1.max())

plt.ylim(X2.min(), X2.max())

for i, j in enumerate(np.unique(y\_set)):

plt.scatter(X\_set[y\_set == j, 0], X\_set[y\_set == j, 1],

c = ListedColormap(('red', 'green'))(i), label = j)

plt.title('Naive Bayes (Training set)')

plt.xlabel('Age')

plt.ylabel('Estimated Salary')

plt.legend()

plt.show()

# Visualising the Test set results

from matplotlib.colors import ListedColormap

X\_set, y\_set = X\_test, y\_test

X1, X2 = np.meshgrid(np.arange(start = X\_set[:, 0].min() - 1, stop = X\_set[:, 0].max() + 1, step = 0.01),

np.arange(start = X\_set[:, 1].min() - 1, stop = X\_set[:, 1].max() + 1, step = 0.01))

plt.contourf(X1, X2, classifier.predict(np.array([X1.ravel(), X2.ravel()]).T).reshape(X1.shape),

alpha = 0.75, cmap = ListedColormap(('red', 'green')))

plt.xlim(X1.min(), X1.max())

plt.ylim(X2.min(), X2.max())

for i, j in enumerate(np.unique(y\_set)):

plt.scatter(X\_set[y\_set == j, 0], X\_set[y\_set == j, 1],

c = ListedColormap(('red', 'green'))(i), label = j)

plt.title('Naive Bayes (Test set)')

plt.xlabel('Age')

plt.ylabel('Estimated Salary')

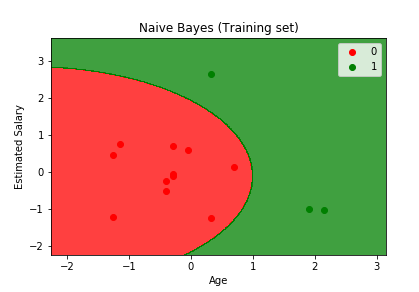
plt.legend()

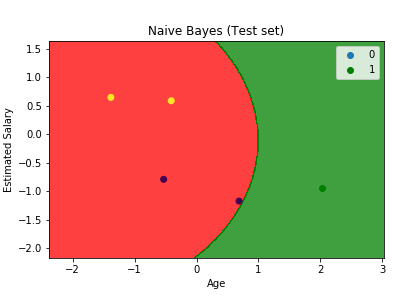
plt.show()

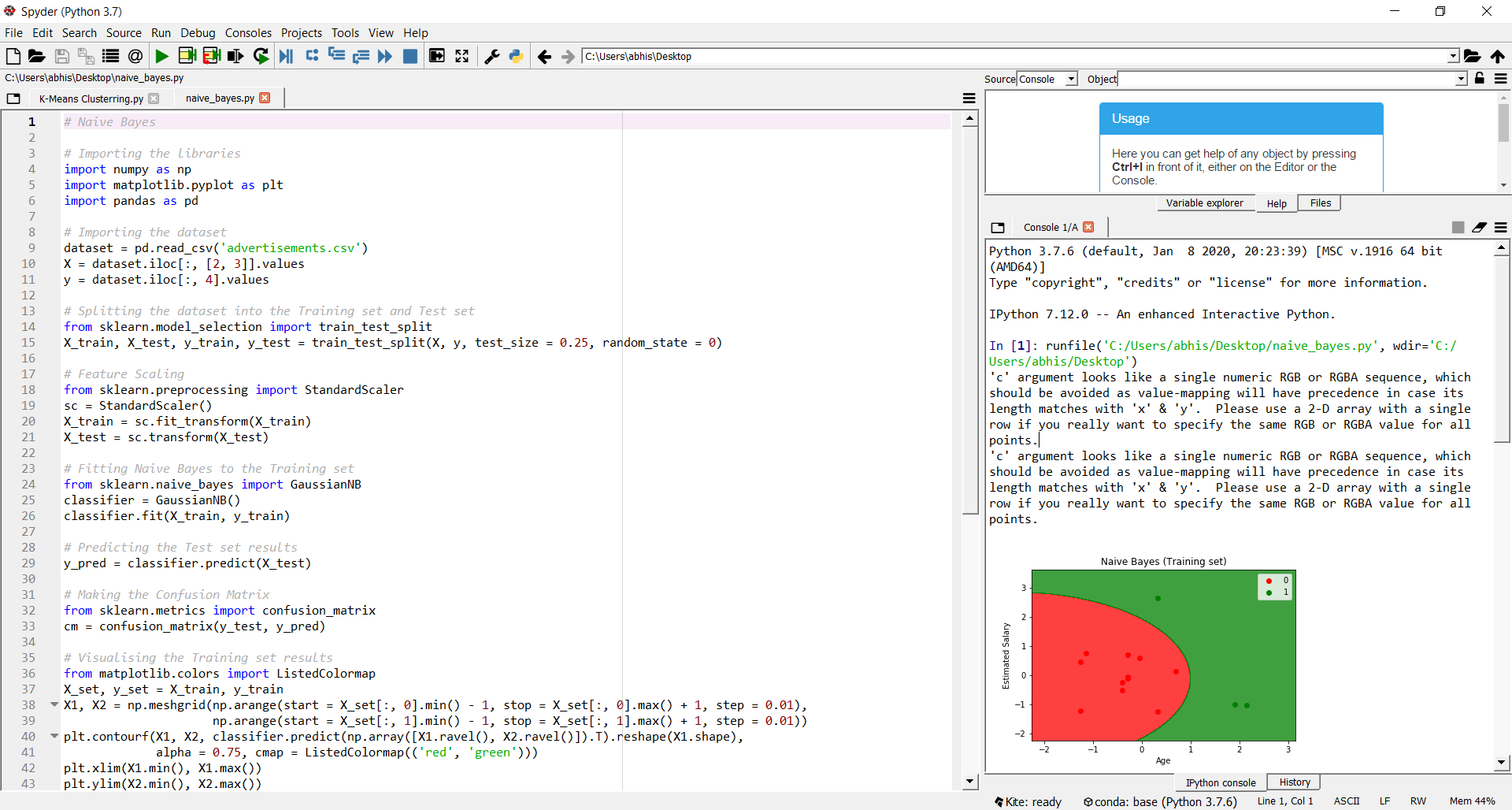
Create a advertisements.csv file in Microsoft Excel and under that file enter the following data:-

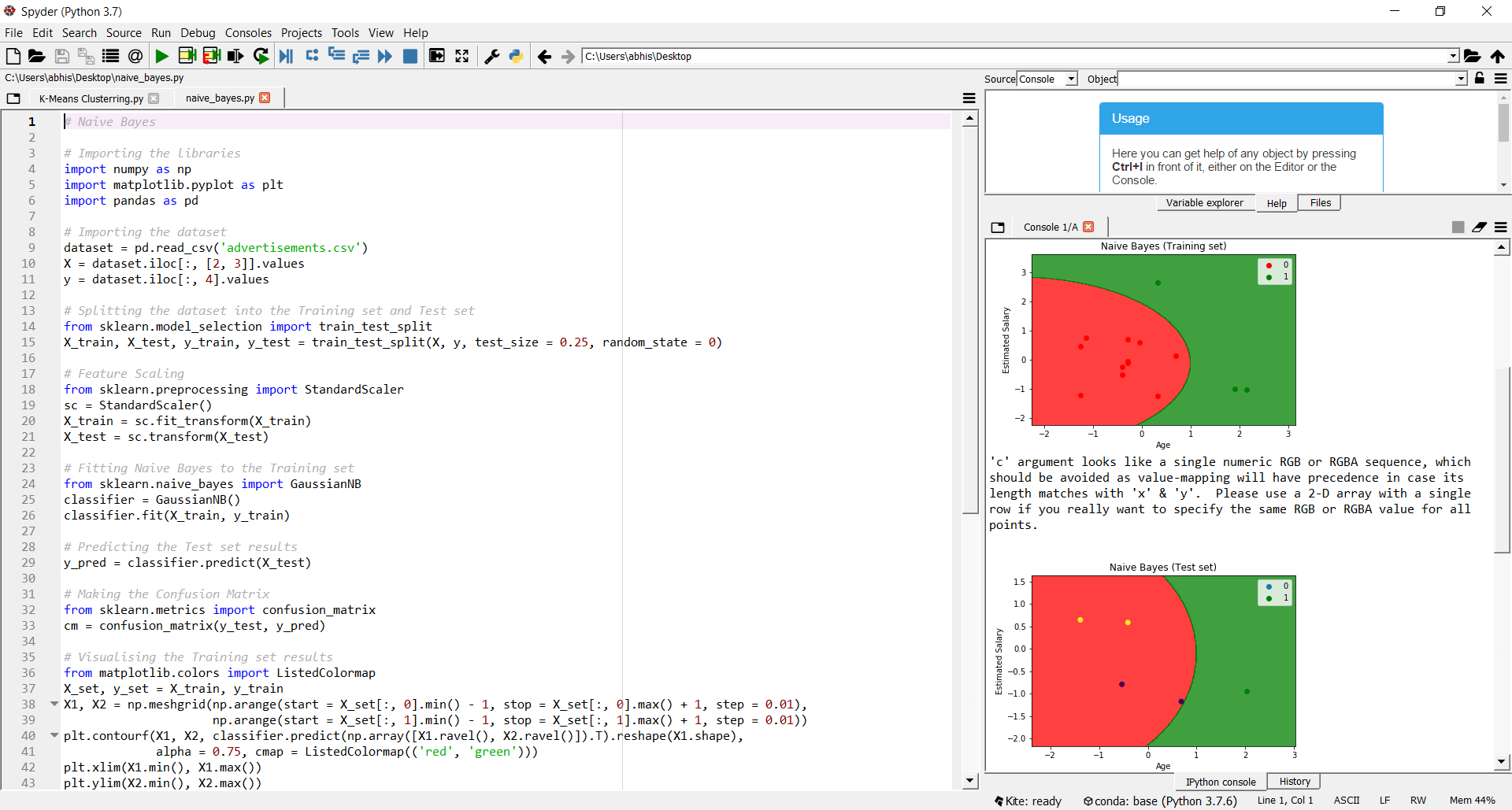
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| User ID | Gender | Age | EstimatedSalary | Purchased |
| 15624510 | Male | 19 | 19000 | 0 |
| 15810944 | Male | 35 | 20000 | 0 |
| 15668575 | Female | 26 | 43000 | 0 |
| 15603246 | Female | 27 | 57000 | 0 |
| 15804002 | Male | 19 | 76000 | 0 |
| 15728773 | Male | 27 | 58000 | 0 |
| 15598044 | Female | 27 | 84000 | 0 |
| 15694829 | Female | 32 | 150000 | 1 |
| 15600575 | Male | 25 | 33000 | 0 |

**Output:-**

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