Experiment2.2

Student Name:Kanishk Soni **UID: 20BCS9398**
Branch: BE-CSE **Section/Group: DM-708/B**
Semester: 6th **Subject Name: Data Mining Lab**
Subject Code: 20CSP-376

1. Aim:

To perform classification using Bayesian classification algorithm using R

Objective:

- The objective here is to determine the likelihood of an event A happening given B happens.
- To evaluate the accuracy and performance of the naïve bayes algorithm.
- Bayes theorem gives the conditional probability of an event A given another event B has occurred.

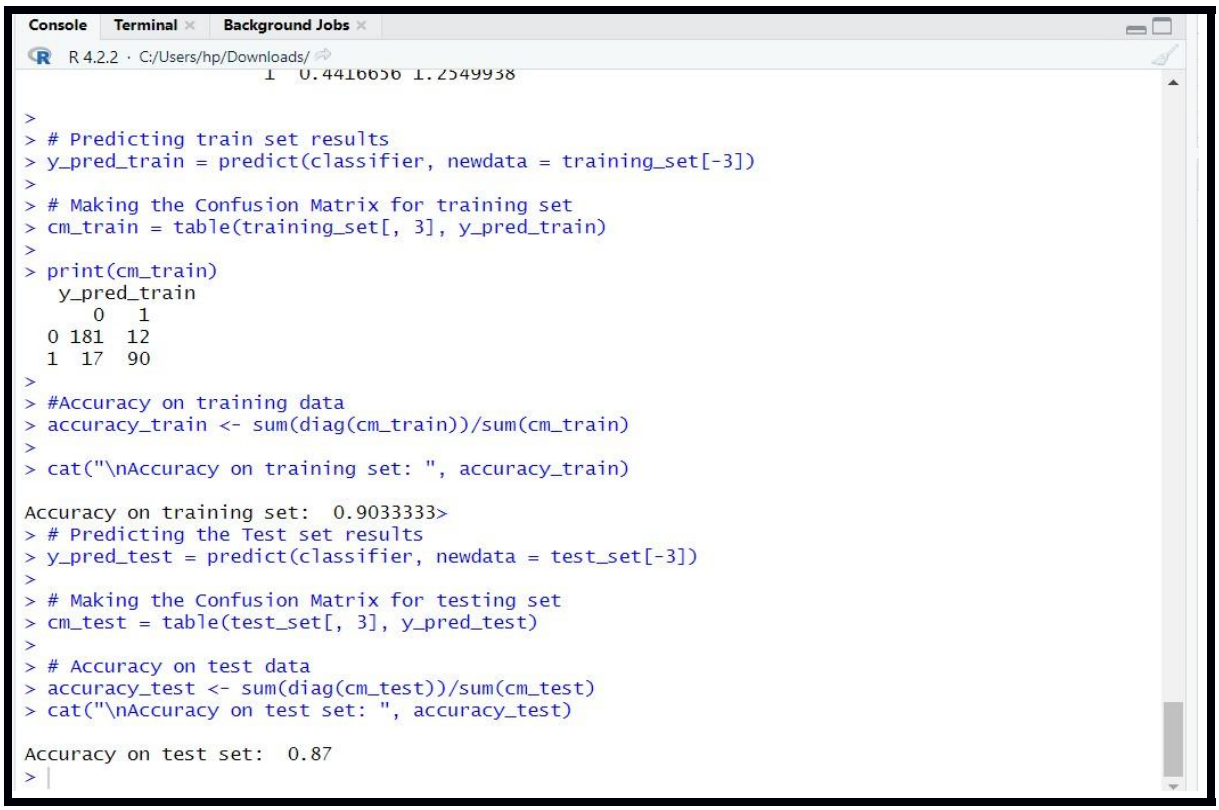
2. Code and Output:

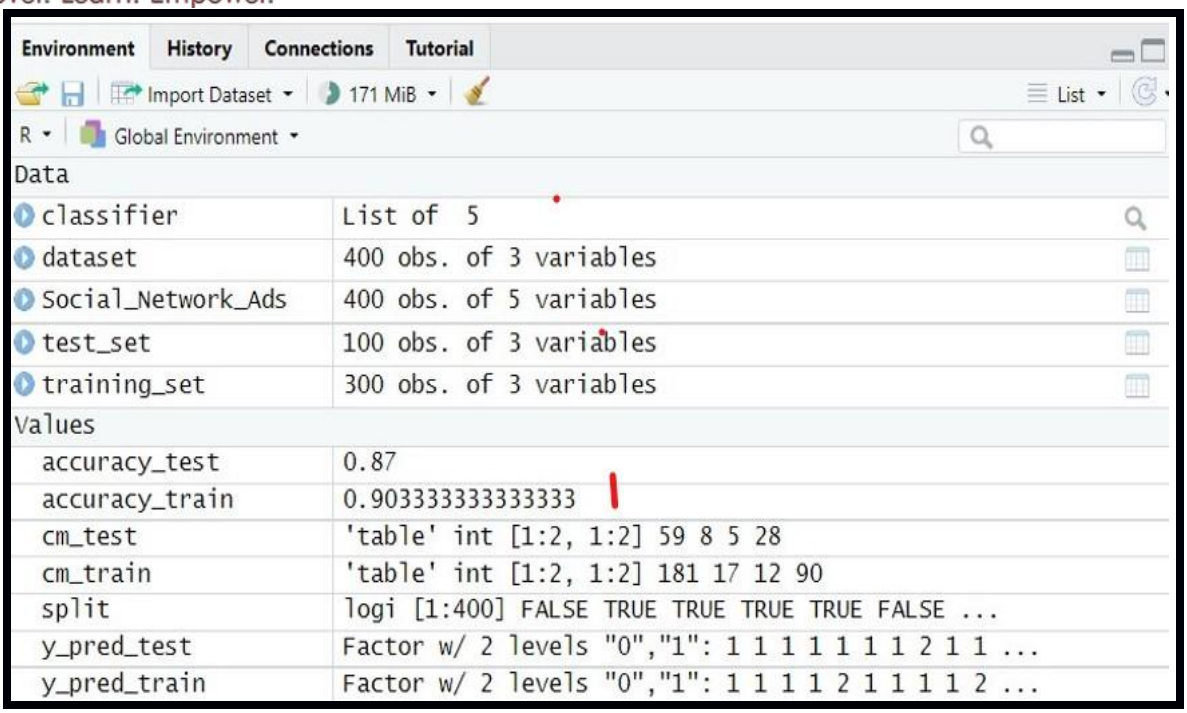
- **PROGRAM**

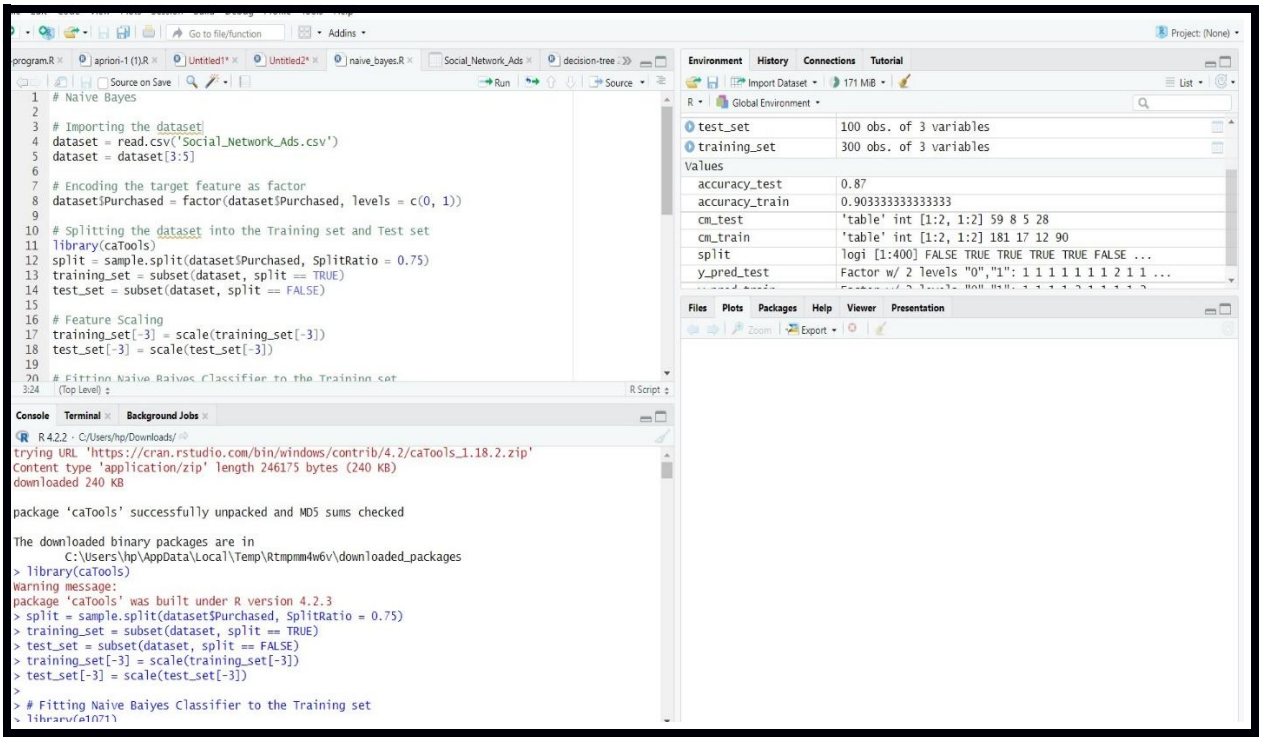
```
# Naive Bayes

# Importing the dataset
dataset = read.csv('Social_Network_Ads.csv')
dataset = dataset[3:5]

# Encoding the target feature as factor
dataset$Purchased = factor(dataset$Purchased, levels = c(0, 1))

# Splitting the dataset into the Training set and Test set
library(caTools)
split = sample.split(dataset$Purchased, SplitRatio = 0.75)
training_set = subset(dataset, split == TRUE)
test_set = subset(dataset, split == FALSE)

# Feature Scaling
training_set[-3] = scale(training_set[-3])
test_set[-3] = scale(test_set[-3])
```

```
# Fitting Naive Baiyes Classifier to the Training set

library(e1071)
classifier = naiveBayes(x = training_set[-3],
                        y = training_set$Purchased)
print(classifier)

# Predicting train set results
y_pred_train = predict(classifier, newdata = training_set[-3])

# Making the Confusion Matrix for training set
cm_train = table(training_set[, 3], y_pred_train)

print(cm_train)

#Accuracy on training data
accuracy_train <- sum(diag(cm_train))/sum(cm_train)

cat("\nAccuracy on training set: ", accuracy_train)

# Predicting the Test set results
y_pred_test = predict(classifier, newdata = test_set[-3])

# Making the Confusion Matrix for testing set
cm_test = table(test_set[, 3], y_pred_test)

# Accuracy on test data
accuracy_test <- sum(diag(cm_test))/sum(cm_test)
cat("\nAccuracy on test set: ", accuracy_test)
```

- **OUTPUT**


Console
Terminal
Background Jobs
R 4.2.2 · C:/Users/hp/Downloads/
1 0.4416656 1.2549938
> # Predicting train set results
> y_pred_train = predict(classifier, newdata = training_set[-3])
> # Making the Confusion Matrix for training set
> cm_train = table(training_set[, 3], y_pred_train)
> print(cm_train)
y_pred_train
0 1
0 181 12
1 17 90
> #Accuracy on training data
> accuracy_train <- sum(diag(cm_train))/sum(cm_train)
> cat("\nAccuracy on training set: ", accuracy_train)
Accuracy on training set: 0.9033333>
> # Predicting the Test set results
> y_pred_test = predict(classifier, newdata = test_set[-3])
> # Making the Confusion Matrix for testing set
> cm_test = table(test_set[, 3], y_pred_test)
> # Accuracy on test data
> accuracy_test <- sum(diag(cm_test))/sum(cm_test)
> cat("\nAccuracy on test set: ", accuracy_test)
Accuracy on test set: 0.87
>


Environment
History
Connections
Tutorial
Import Dataset
171 MiB
List
R
Global Environment
Data
classifier
List of 5
dataset
400 obs. of 3 variables
Social_Network_Ads
400 obs. of 5 variables
test_set
100 obs. of 3 variables
training_set
300 obs. of 3 variables
Values
accuracy_test
0.87
accuracy_train
0.903333333333333
cm_test
'table' int [1:2, 1:2] 59 8 5 28
cm_train
'table' int [1:2, 1:2] 181 17 12 90
split
logi [1:400] FALSE TRUE TRUE TRUE TRUE FALSE ...
y_pred_test
Factor w/ 2 levels "0","1": 1 1 1 1 1 1 1 2 1 1 ...
y_pred_train
Factor w/ 2 levels "0","1": 1 1 1 1 2 1 1 1 1 2 ...


# Naive Bayes
# Importing the dataset
dataset = read.csv('Social_Network_Ads.csv')
dataset = dataset[3:5]
# Encoding the target feature as factor
dataset$Purchased = factor(dataset$Purchased, levels = c(0, 1))
# Splitting the dataset into the Training set and Test set
library(caTools)
split = sample.split(dataset$Purchased, SplitRatio = 0.75)
training_set = subset(dataset, split == TRUE)
test_set = subset(dataset, split == FALSE)
# Feature Scaling
training_set[-3] = scale(training_set[-3])
test_set[-3] = scale(test_set[-3])
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.2/caTools_1.18.2.zip'
Content type 'application/zip' length 246175 bytes (240 KB)
downloaded 240 KB
package 'caTools' successfully unpacked and MD5 sums checked
The downloaded binary packages are in
C:\Users\hp\AppData\Local\Temp\Rtmpmm4w6v\downloaded_packages
> library(caTools)
Warning message:
package 'caTools' was built under R version 4.2.3
> split = sample.split(dataset$Purchased, SplitRatio = 0.75)
> training_set = subset(dataset, split == TRUE)
> test_set = subset(dataset, split == FALSE)
> training_set[-3] = scale(training_set[-3])
> test_set[-3] = scale(test_set[-3])
> # Fitting Naive Baiyes Classifier to the Training set