Ex No 7

Implement Linear and Logistic Regression in R

AIM:

To Implement Linear and Logistic Regression using R

PROCEDURE:

- Collect and load the dataset from sources like CSV files or databases.
- Clean and preprocess the data, including handling missing values and encoding categorical variables.
- Split the dataset into training and testing sets to evaluate model performance.
- Normalize or standardize the features to ensure consistent scaling. 5.Choose the appropriate model: Linear Regression for continuous outcomes. ● Train the model on the training data using the `fit` method.
- Make predictions on the testing data using the `predict` method.
- Evaluate the model using metrics like Mean Squared Error (MSE) for Linear Regression or accuracy and confusion matrix for Logistic Regression.
- Visualize the results with plots, such as scatter plots for Linear Regression or decision boundaries for Logistic Regression.
- Fine-tune the model by adjusting hyperparameters or applying regularization Techniques.

CODE:

LinearRegression.R:

```
# Sample data heights <- c(150, 160, 165, 170,
175, 180, 185) weights <- c(55, 60, 62, 68, 70,
75, 80)
```

```
# Create a data frame data <- data.frame(heights,

weights) # Fit a linear regression model

linear_model <- lm(weights ~ heights, data = data)

# Print the summary of the model
print(summary(linear_model)) # Plotting the data

and regression line plot(data$heights,

data$weights,      main = "Linear Regression:

Weight vs. Height",      xlab = "Height (cm)",

ylab = "Weight (kg)",      pch = 19, col = "blue") #

Add regression line  abline(linear_model, col =

"red", lwd = 2)
```

LogisticRegression.R:

```
# Load the dataset data(mtcars)

# Convert 'am' to a factor (categorical variable) mtcars$am <- factor(mtcars$am,

levels = c(0, 1), labels = c("Automatic", "Manual"))

# Fit a logistic regression model logistic_model <- glm(am ~ mpg,

data = mtcars, family = binomial)

# Print the summary of the model print(summary(logistic_model))

# Predict probabilities for the logistic model predicted_probs

<- predict(logistic_model, type = "response")

# Display the predicted probabilities print(predicted_probs)

# Plotting the data and logistic regression curve

plot(mtcars$mpg, as.numeric(mtcars$am) - 1,      main =
```

"Logistic Regression: Transmission vs. MPG", xlab =

```
"Miles Per Gallon (mpg)",      ylab = "Probability of Manual Transmission",
```

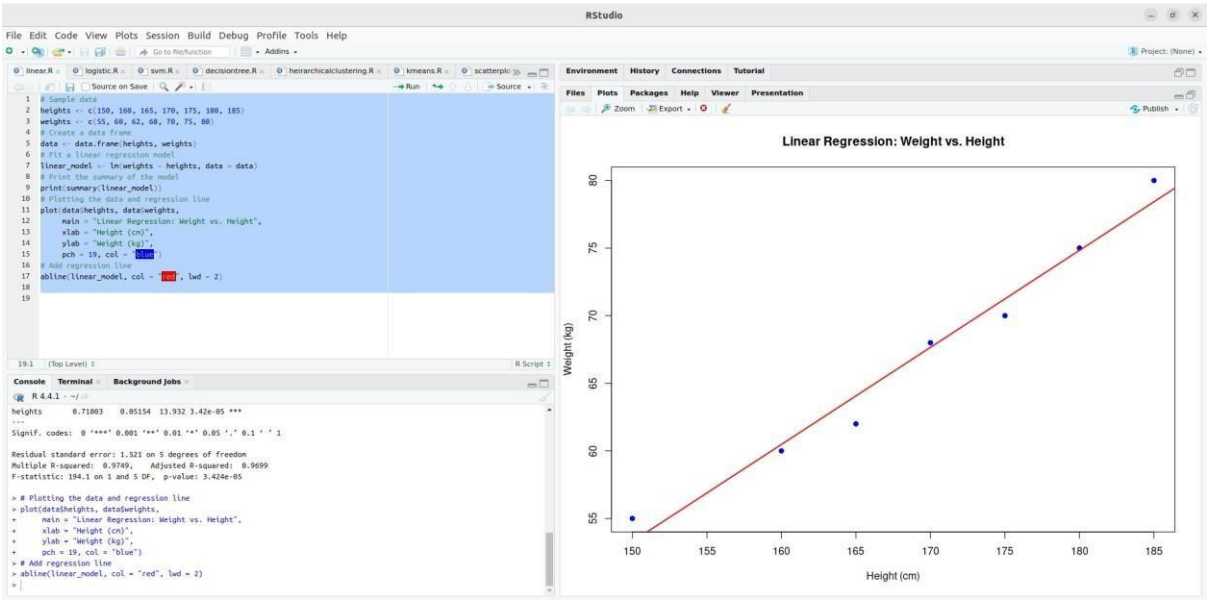
pch = 19, col = "blue") # Add the logistic regression curve

curve(predict(logistic_model, data.frame(mpg = x), type = "response"), add =

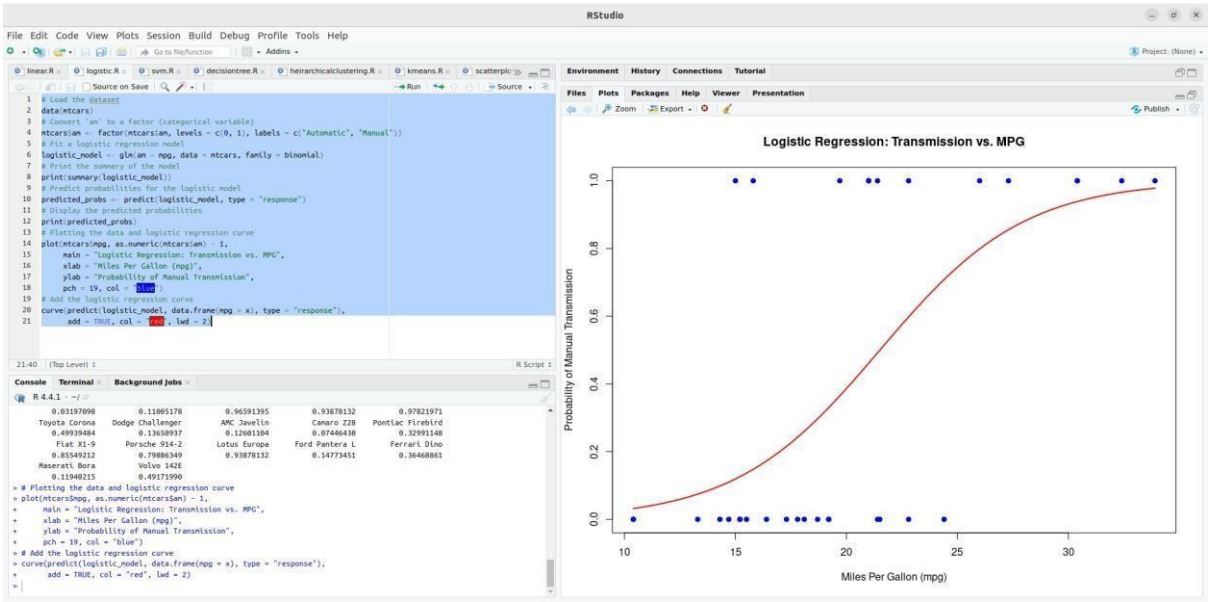
TRUE, col = "red", lwd = 2)

OUTPUT:

Linear Regression:



Logistic Regression:



RESULT:

Thus to Implement Linear and Logistic Regression using R has been successfully executed.