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)
```

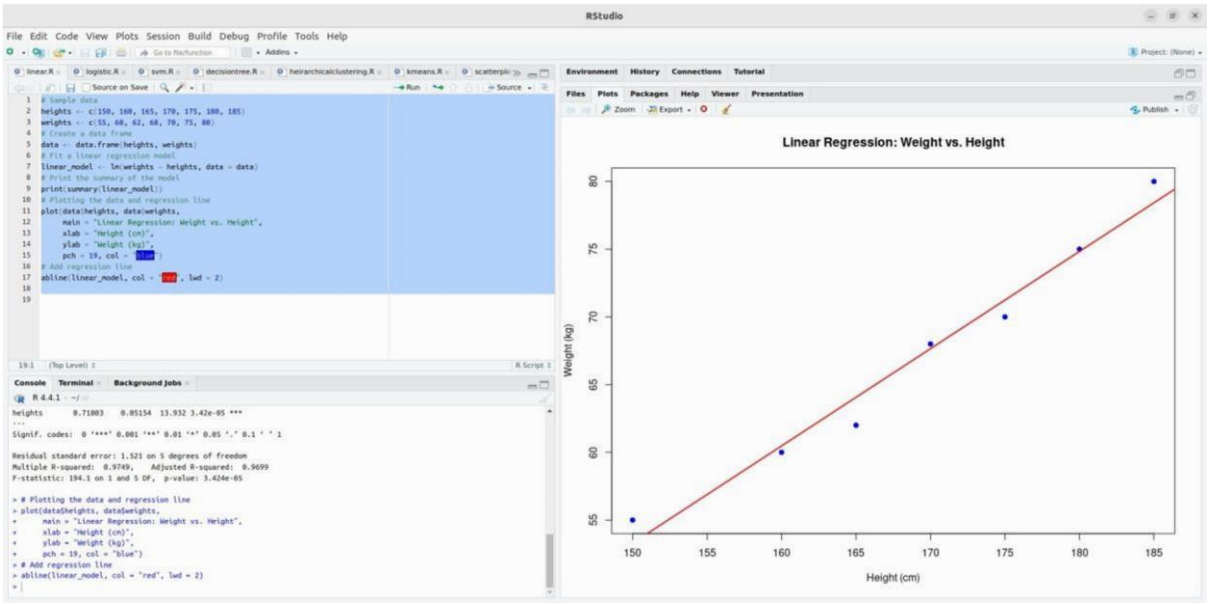
LogisticRegression.R:

```
# 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
```

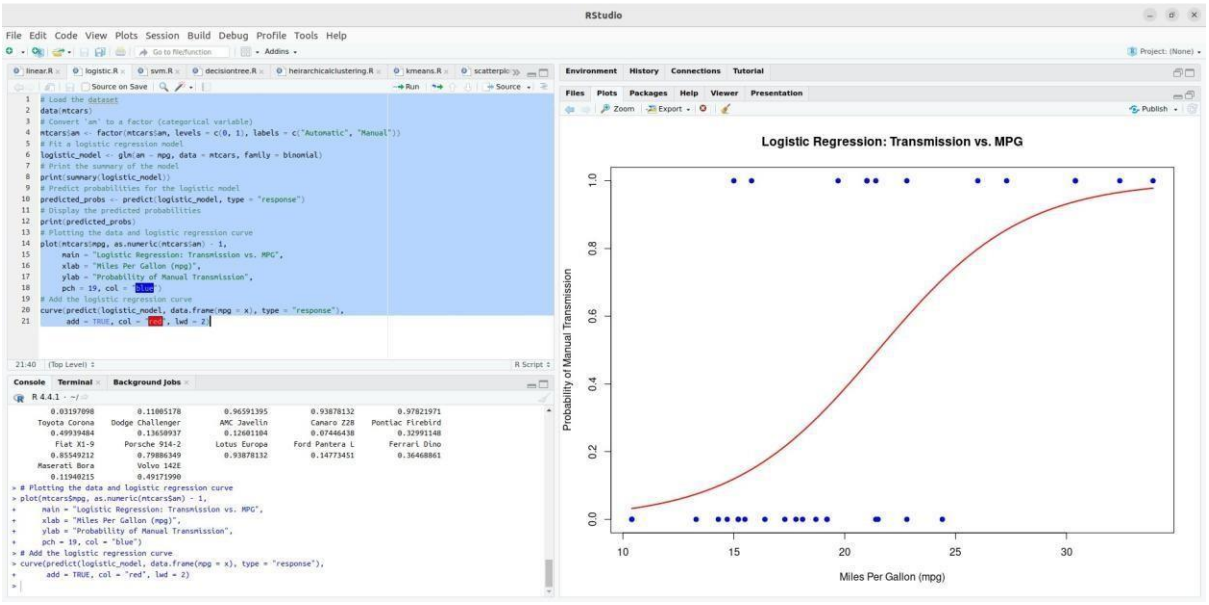
```
curve(predict(logistic_model, data.frame(mpg = x), type = "response"), add
    = TRUE, col = "red", lwd = 2)
```

OUTPUT:

Linear Regression:



Logistic Regression:



RESULT:

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