EX.NO:7 **210701023**

Implement Linear and Logistic Regression

AIM:

To implement Linear and Logistic Regression using R programming in R Studio. **a)Linear regression**

```
# 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)
```

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OUTPUT:

linear regression - RStudio

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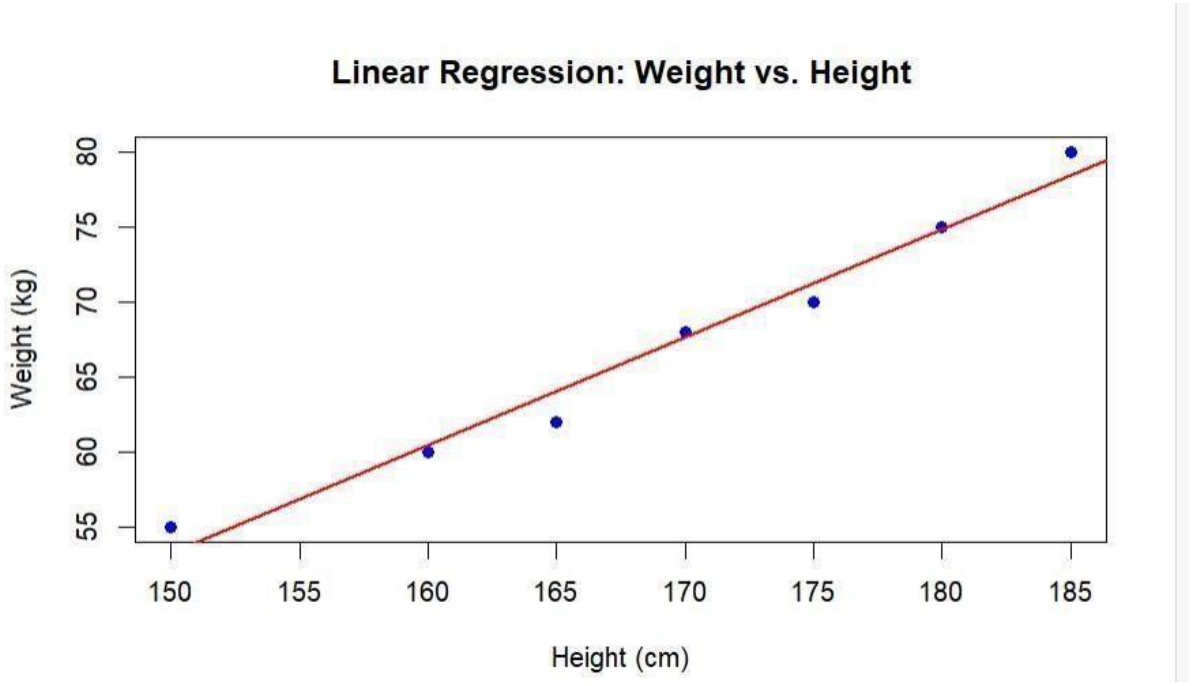
```
# Sample data
heights <- c(150, 160, 165, 170, 175, 180, 185)
weights <- c(55, 60, 62, 68, 70, 75, 80)
# Create a data frame
data <- data.frame(heights, weights)
# Fit a linear regression model
linear_model <- lm(weights ~ heights, data = data)
# Print the summary of the model
print(summary(linear_model))
# 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)
```



b) Logistic regression

```
# 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:

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Linear regression.R | Logistic regression.R

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```
# 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)
```

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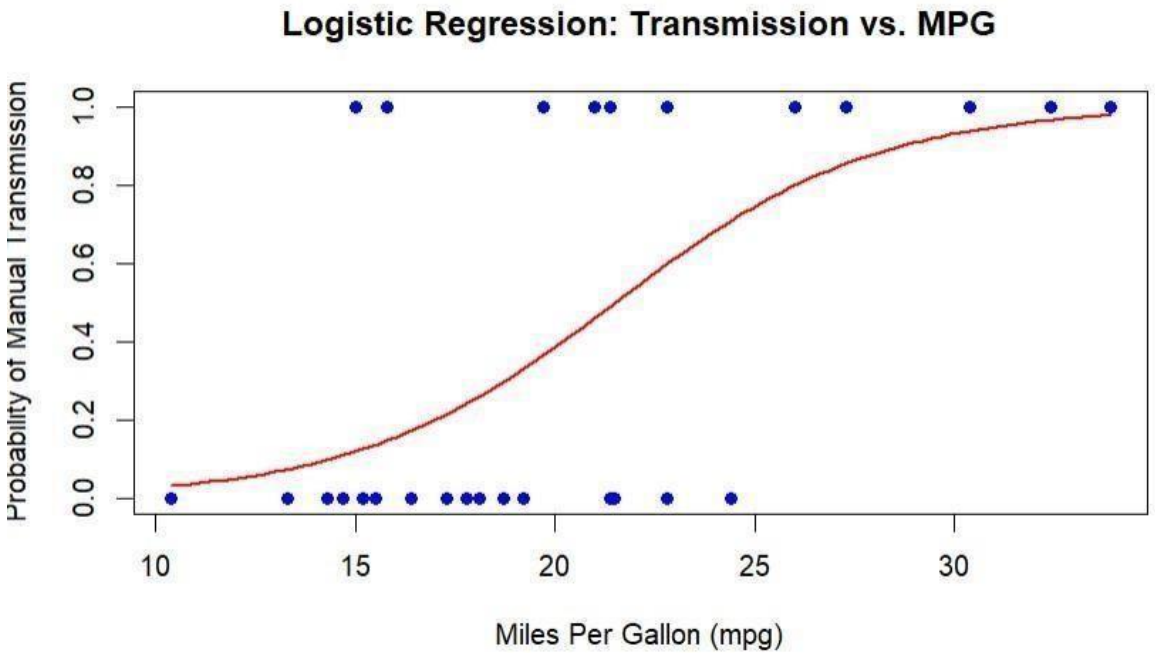

RESULT:

Thus the implementation Linear and Logistic Regression using R programming in R Studio have been successfully executed.