Exp.No: 7

IMPLEMENT LINEAR AND LOGISTIC REGRESSION

AIM:

To write an R code to implement linear and logistic regression.

PROCEDURE:

1. Create sample data for heights and weights, fit a linear regression model, and plot the data with the regression line.

2. Use the sample data to create a data frame for the regression model.

3. Fit the linear regression model using the `lm()` function and display the summary.

4. Plot the data points and add the regression line using the `plot()` and `abline()` functions.

5. Load the `mtcars` dataset, convert the 'am' variable to a factor, fit a logistic regression model using the `glm()` function, and plot the probabilities.

PROGRAM CODE:

a) **Linear regression**

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

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

print(summary(linear_model))


# Plotting Linear Regression plot(data$heights,
data$weights,     main = "Linear Regression:
Weight vs. Height",     xlab = "Height (cm)",
ylab = "Weight (kg)",     pch = 19, col = "blue")

abline(linear_model, col = "red", lwd = 2)
```

OUTPUT:
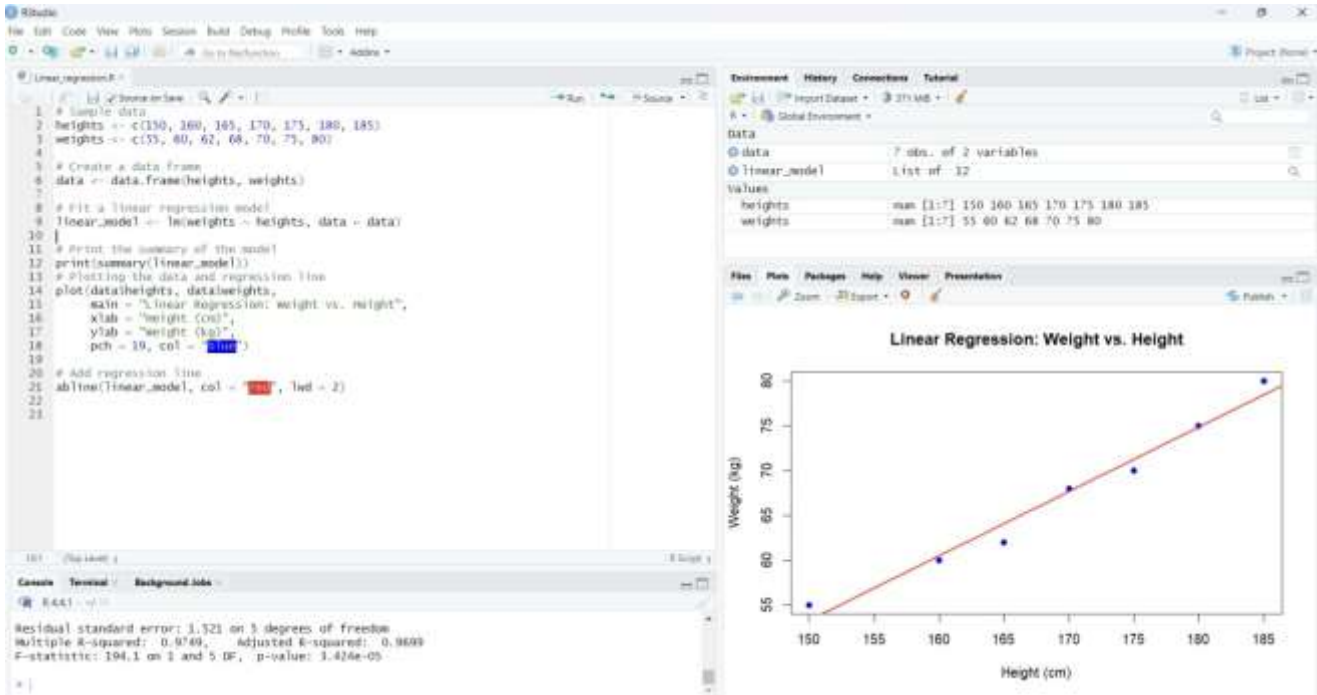
b) Logistic regression

```
# Logistic Regression data(mtcars) mtcars$am <- factor(mtcars$am, levels = c(0, 1),

labels = c("Automatic", "Manual")) logistic_model <- glm(am ~ mpg, data = mtcars,

family = binomial) print(summary(logistic_model))


# Plotting Logistic Regression predicted_probs <-

predict(logistic_model, type = "response")

print(predicted_probs) 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")

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

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

OUTPUT:
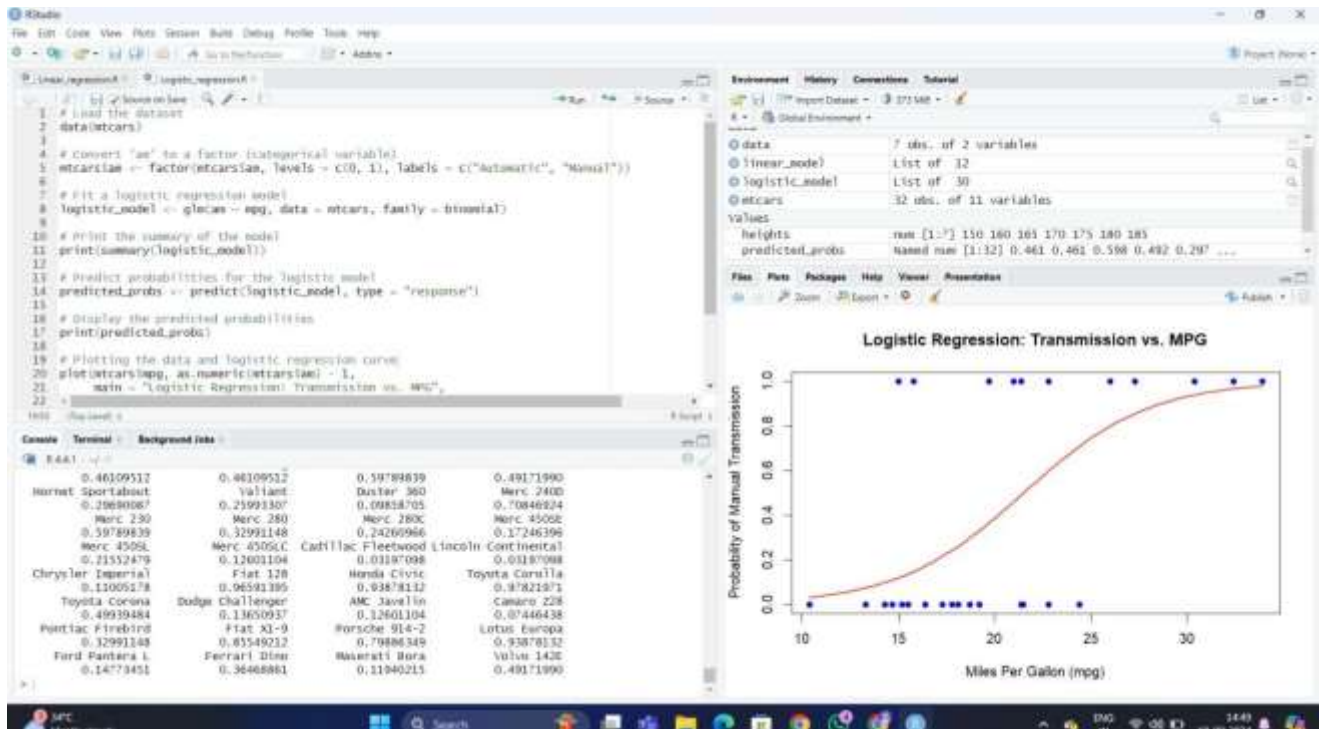
RESULT:

Thus the R program to implement Linear and Logistic Regression has been executed and verified successfully.