

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:

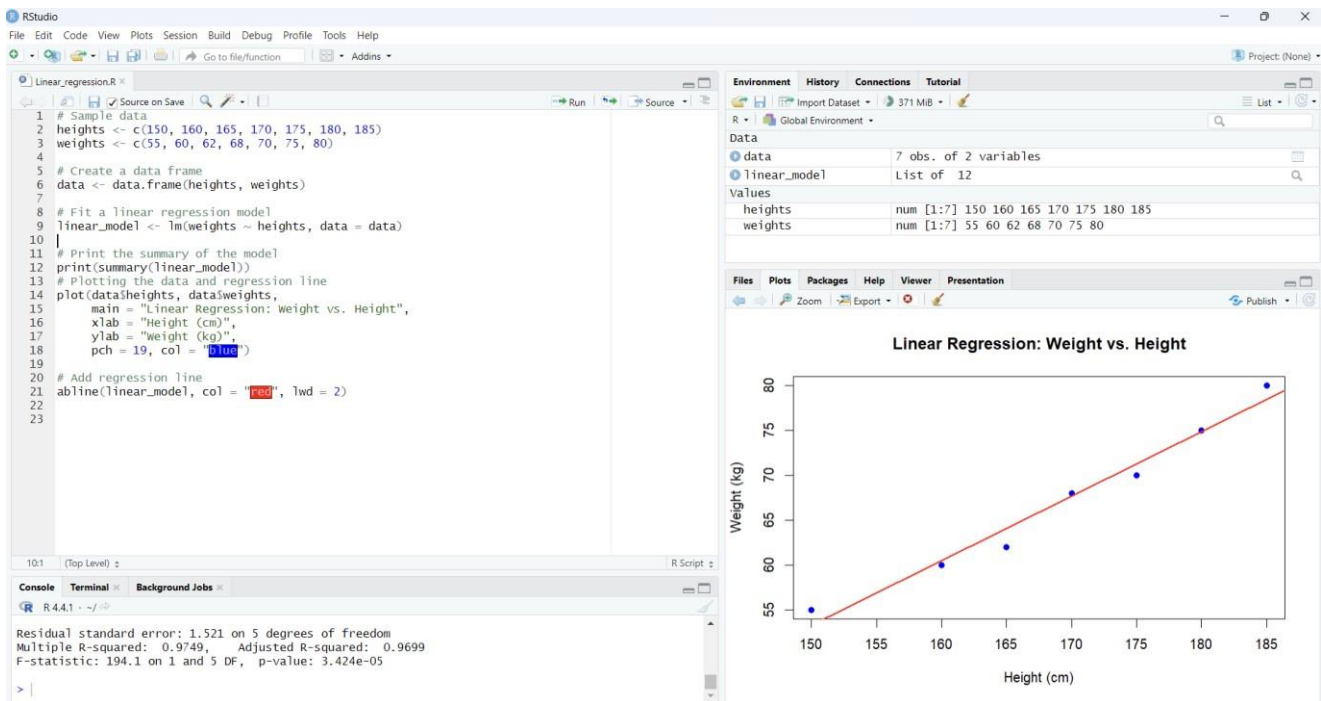
a) Linear regression

```
# 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:

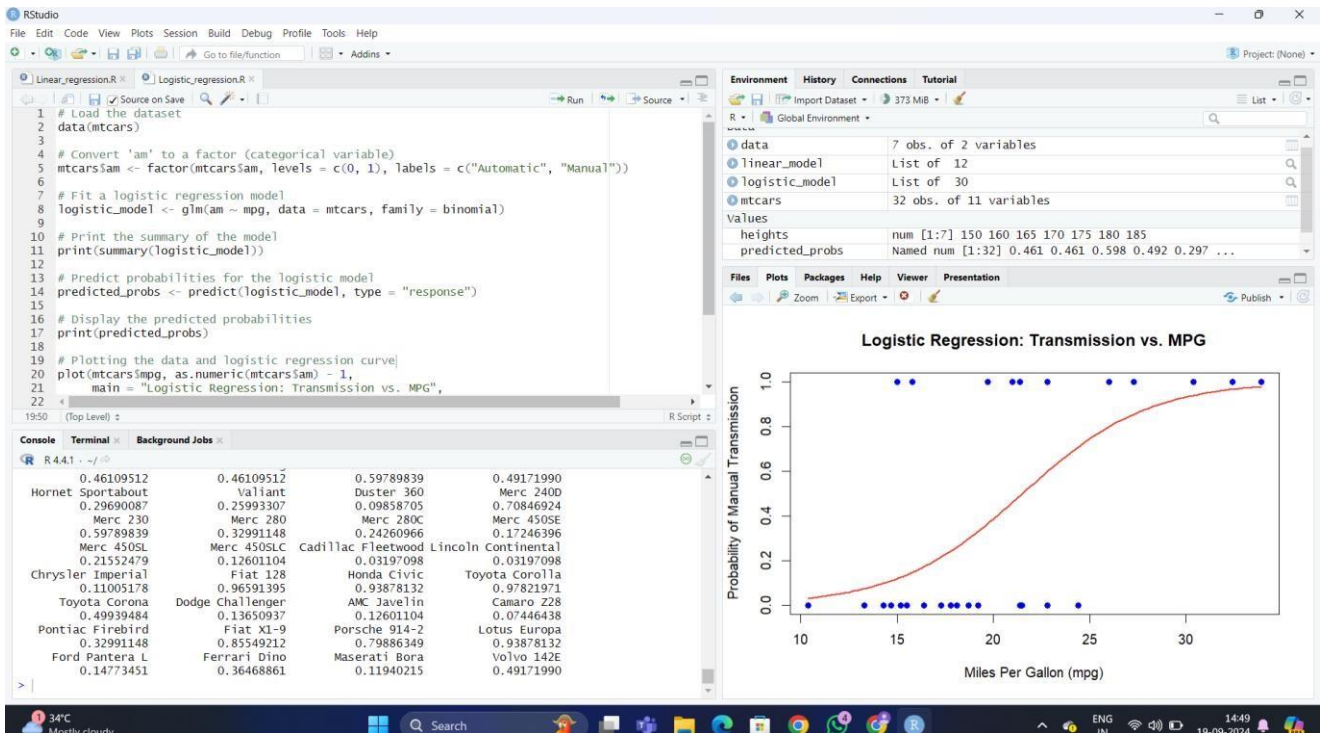


b) Logistic regression

```
# 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.