**Exp. No : 7**

**Implementing Linear and Logistic Regression**

1. 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)",

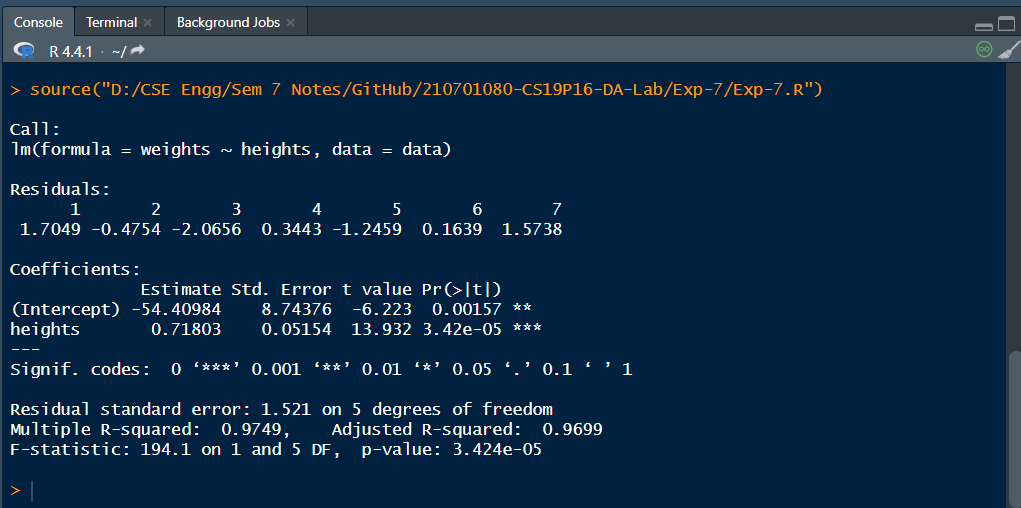
ylab = "Weight (kg)",

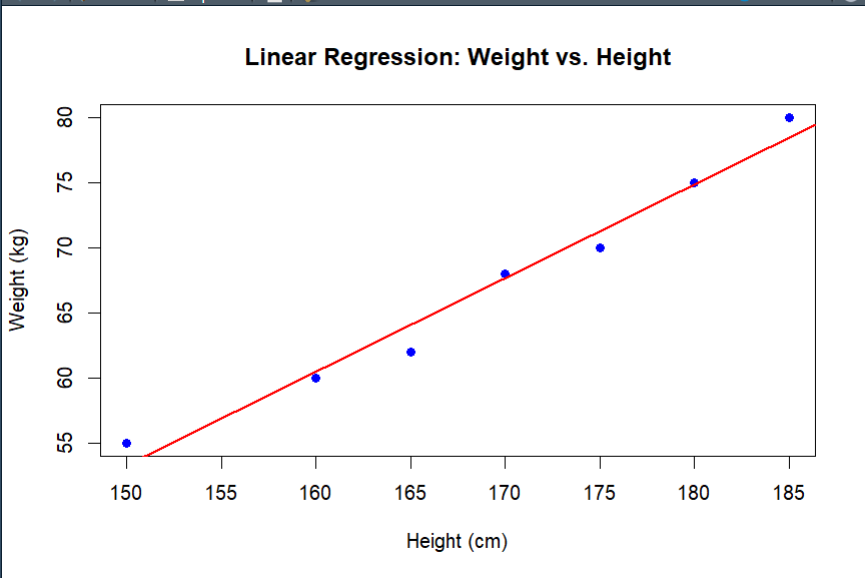
pch = 19, col = "blue")

# Add regression line

abline(linear\_model, col = "red", lwd = 2)

**Output:**

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1. 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",

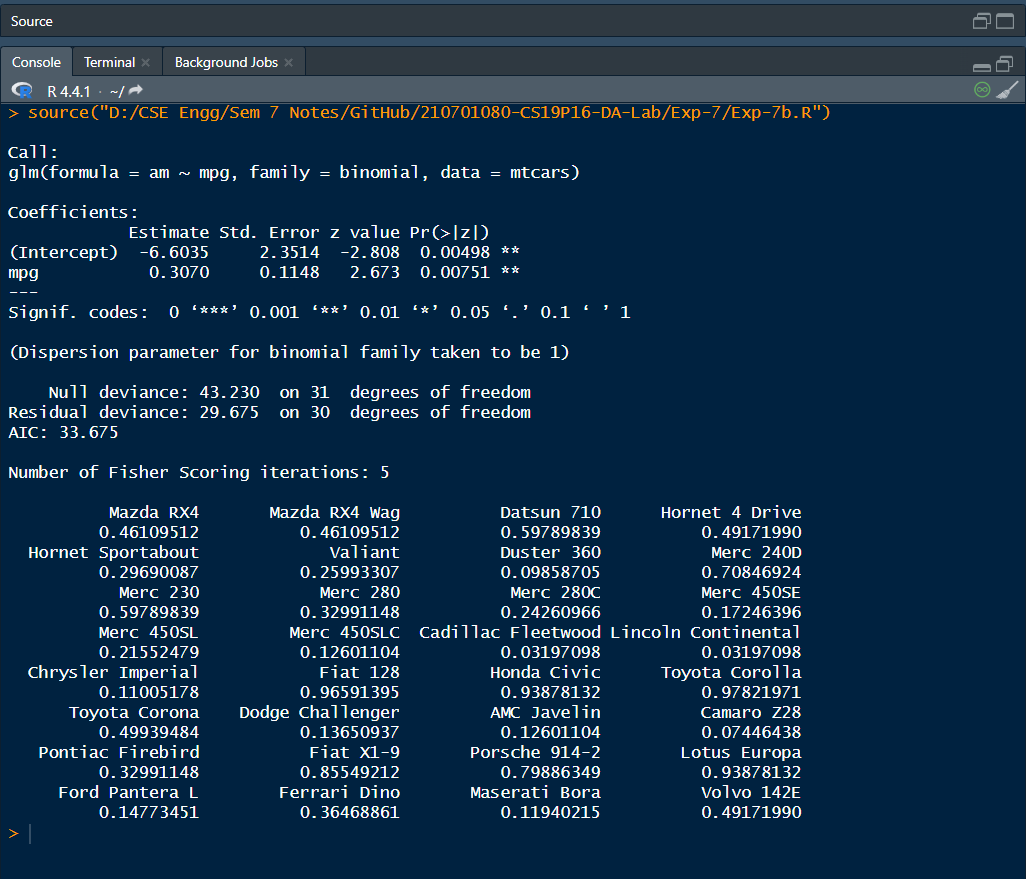
pch = 19, col = "blue")

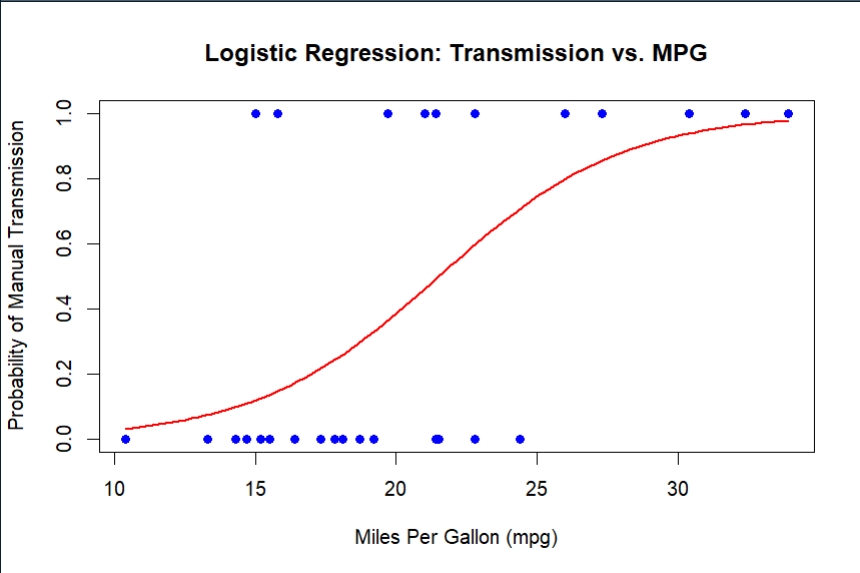
# Add the logistic regression curve

curve(predict(logistic\_model, data.frame(mpg = x), type = "response"),

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

**Output:**



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