**Exp. No : 7**

# Implementing Linear and Logistic Regression

a) Linear Regression

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

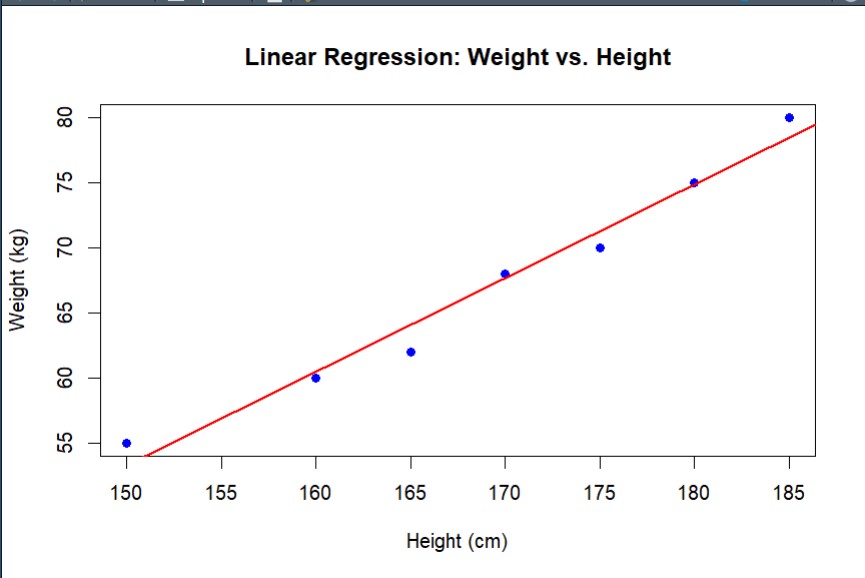
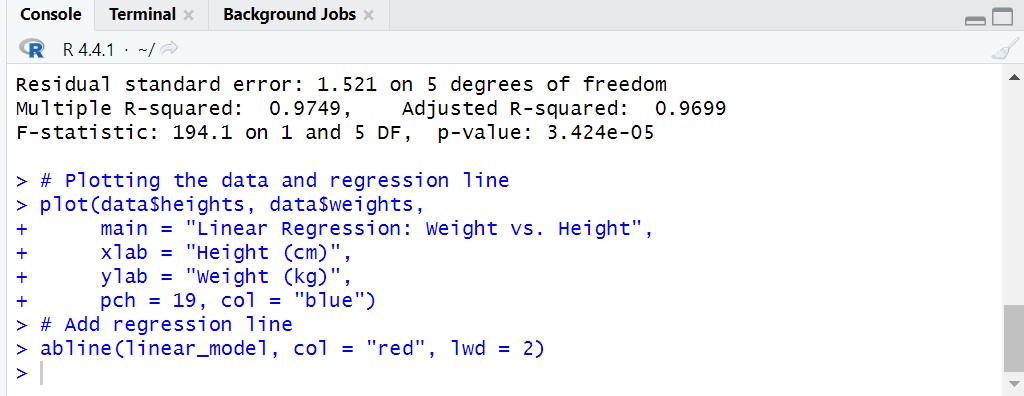
# Create a data frame data <- data.frame(heights, weights)

# 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) **Output:**



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:**

