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| **EX.NO: 7 REGISTER NO: 210701284**  **DATE:**  **IMPLEMENT LINEAR AND LOGISTIC REGRESSION AIM:**  To implement Linear and Logistic Regression.  **PROGRAM CODE:**  **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)    **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:**

**Linear Regression:**

**Logistic Regression:**

**RESULT:**

Thus the implementation of Linear and Logistic Regression done successfully.

