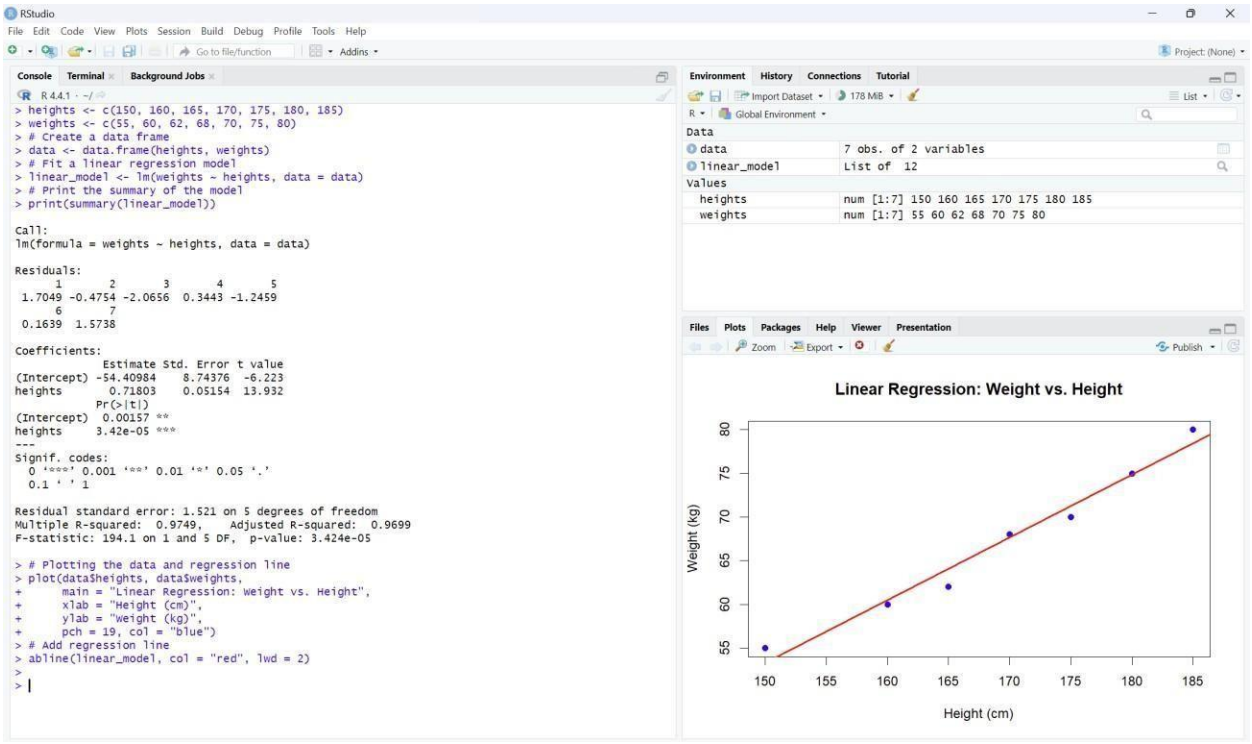
Exp No: 7

Implement 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)
```



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)",
```

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 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)
```