

Exp.No: 7**IMPLEMENT LINEAR AND LOGISTIC REGRESSION****AIM:**

To write an R code to implement linear and logistic regression.

PROCEDURE:

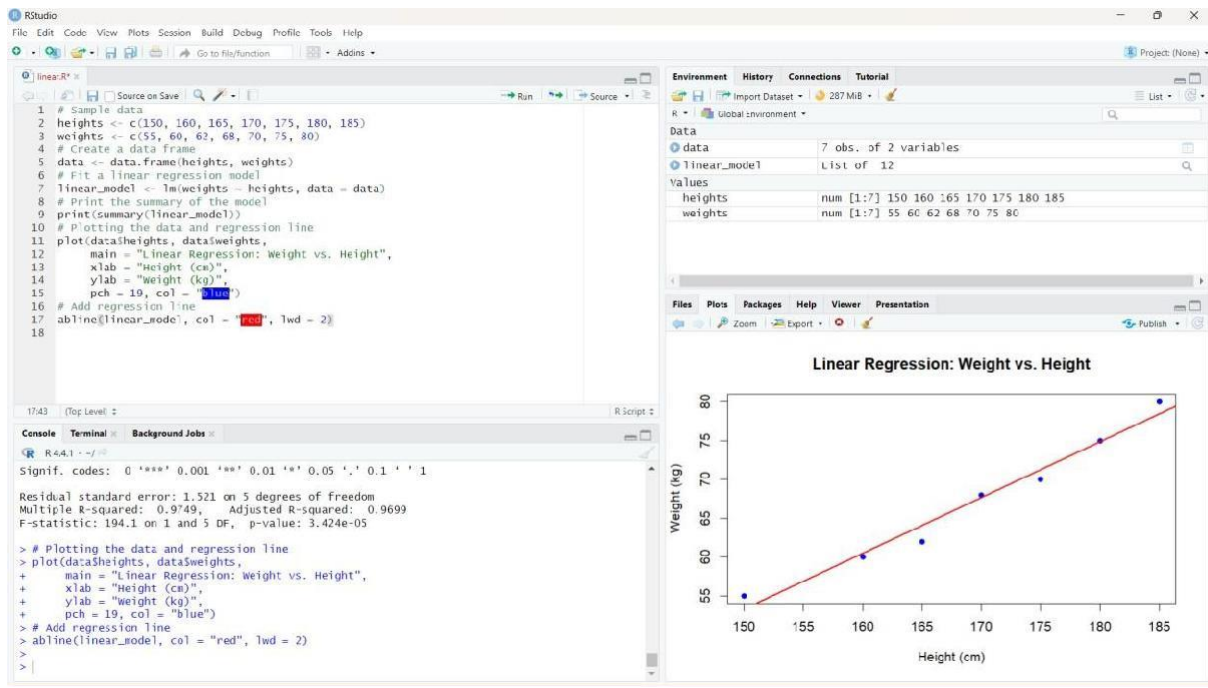
1. Create sample data for heights and weights, fit a linear regression model, and plot the data with the regression line.
2. Use the sample data to create a data frame for the regression model.
3. Fit the linear regression model using the `lm()` function and display the summary.
4. Plot the data points 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"),

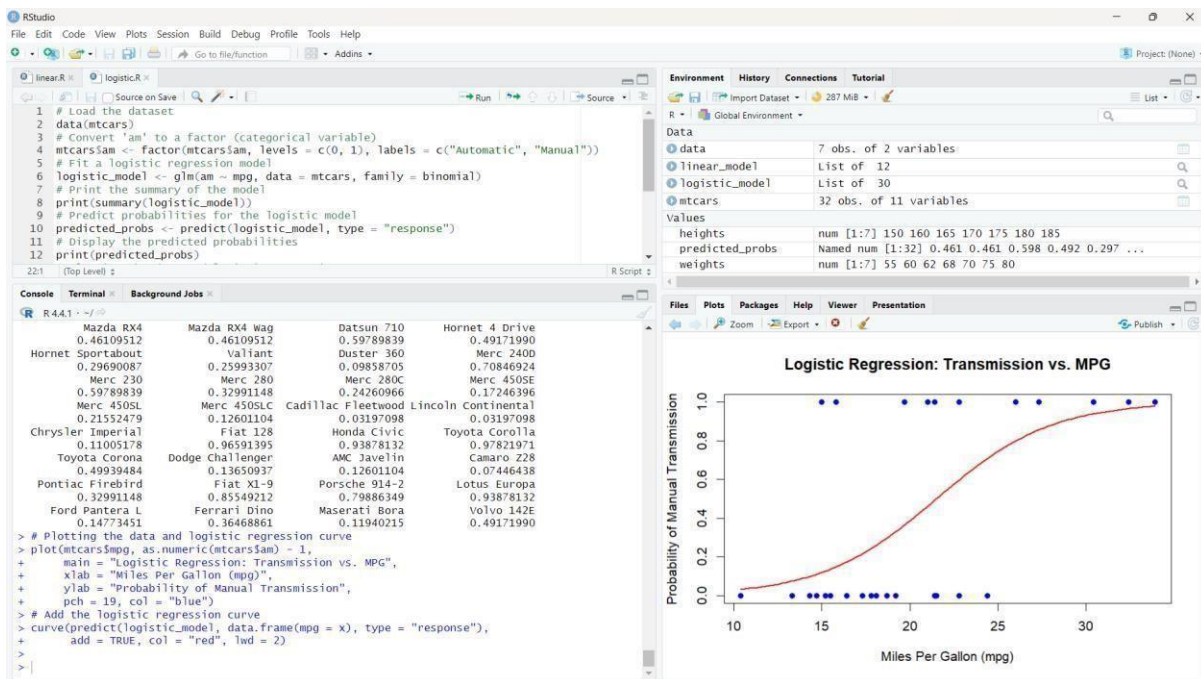
```

```

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

```

OUTPUT:

**RESULT:**

Thus the R program to implement Linear and Logistic Regression has been executed and verified successfully.