

Ex 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,
```

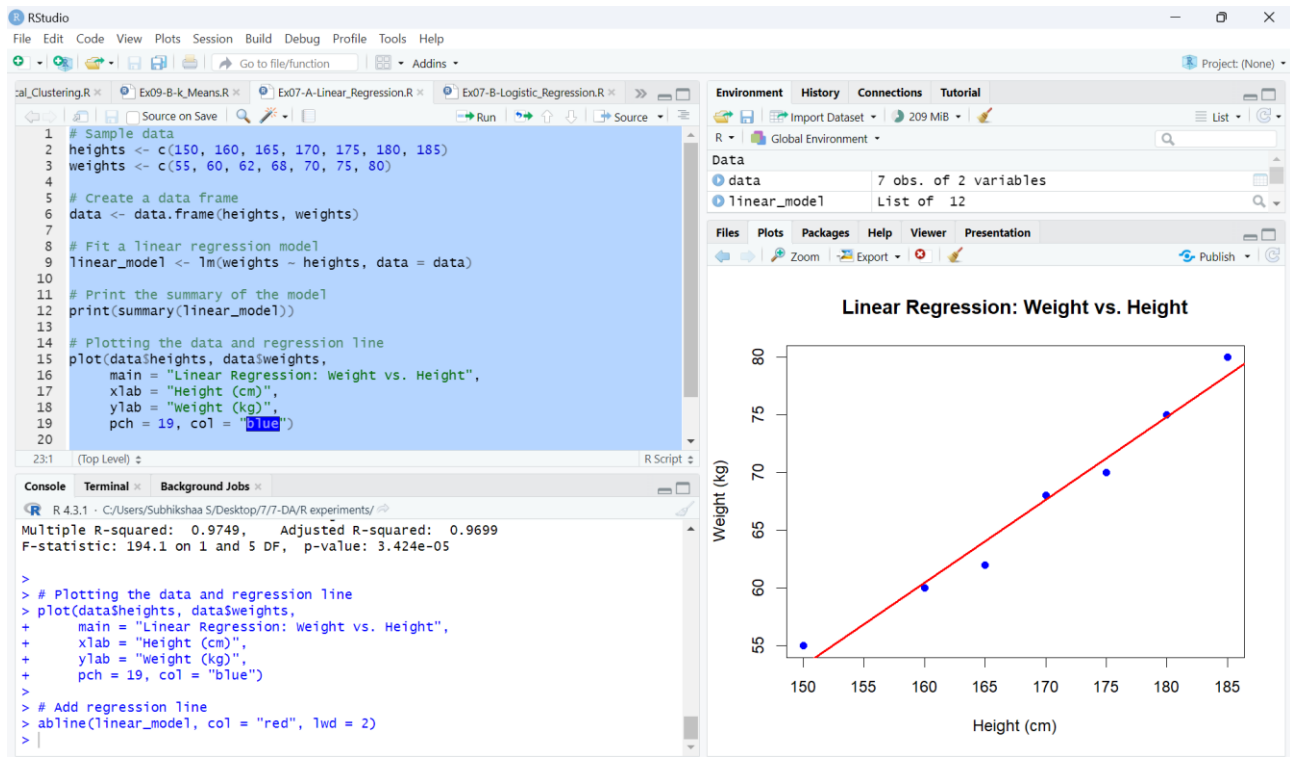
```
  main = "Linear Regression: Weight vs. Height",
```

```
  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",

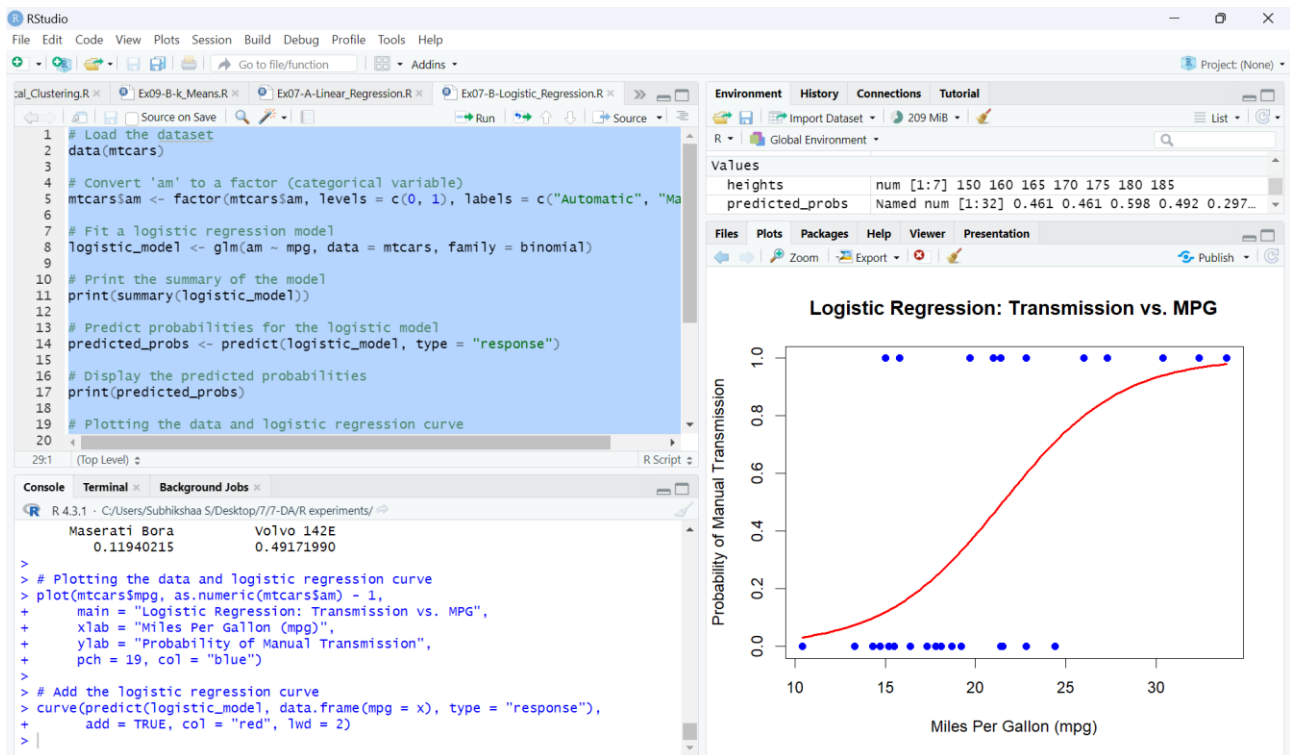
xlab = "Miles Per Gallon (mpg)",

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.