

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

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

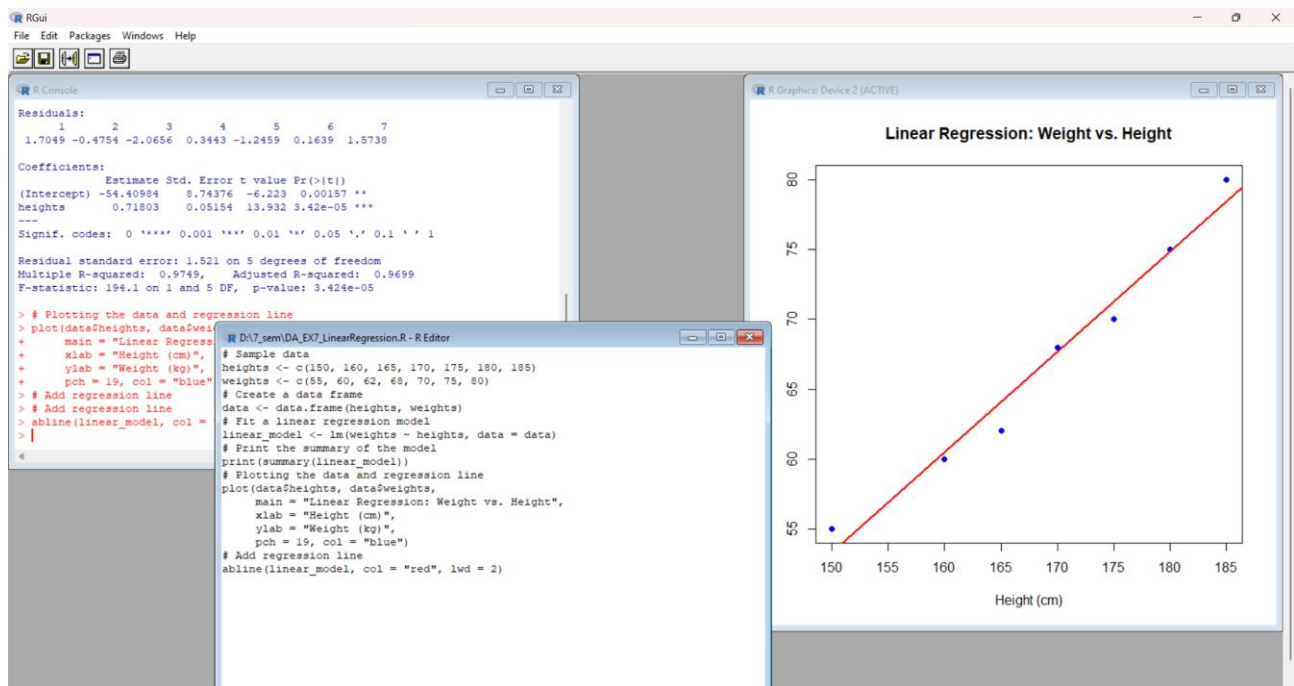
PROCEDURE:

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:

```
# 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:
```

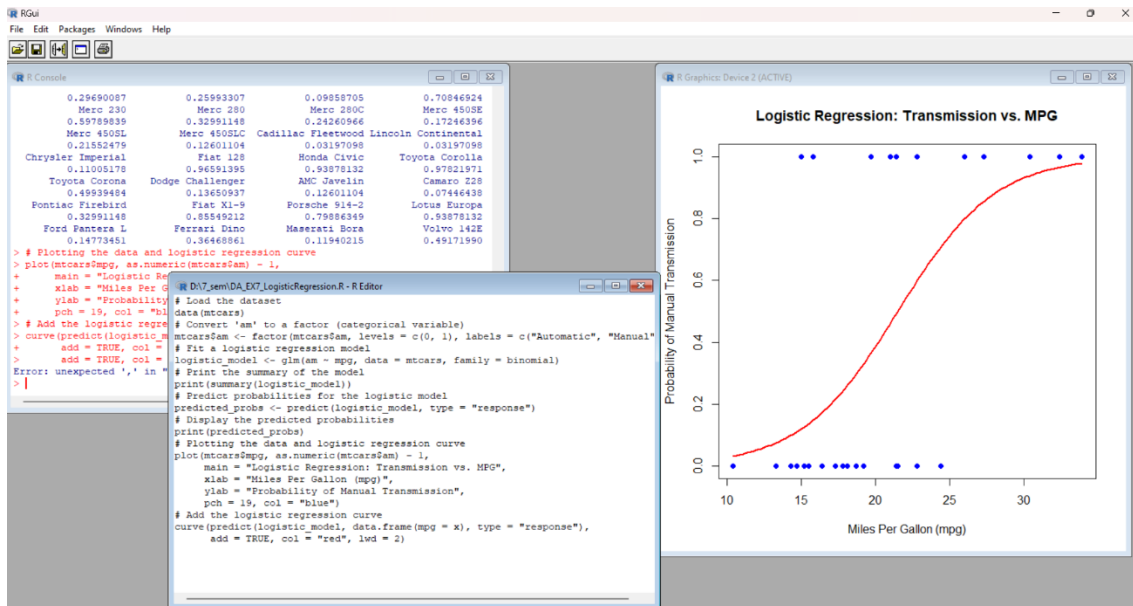
```
Transmission vs. MPG", xlab = "Miles Per Gallon (mpg)",
```

```
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.