Experiment No. 3

Aim - Implement Multiple Linear Regression using R/Python programming.

Objective:- To understand the use of Multiple linear regression techniques by implementing a predefined dataset of R Studio.

Description-
Multiple linear regression is the extension of linear regression in the relationship between more than two variables. In simple linear regression, we have one predictor and one response variable. But in multiple regressions, we have more than one predictor variable and one response variable. There is the following general mathematical equation for multiple regression -

$$y=b_0 +b_1 *x_1 +b_2 *x_2 +b_3 *x_3 +\cdots b_n *x_n$$

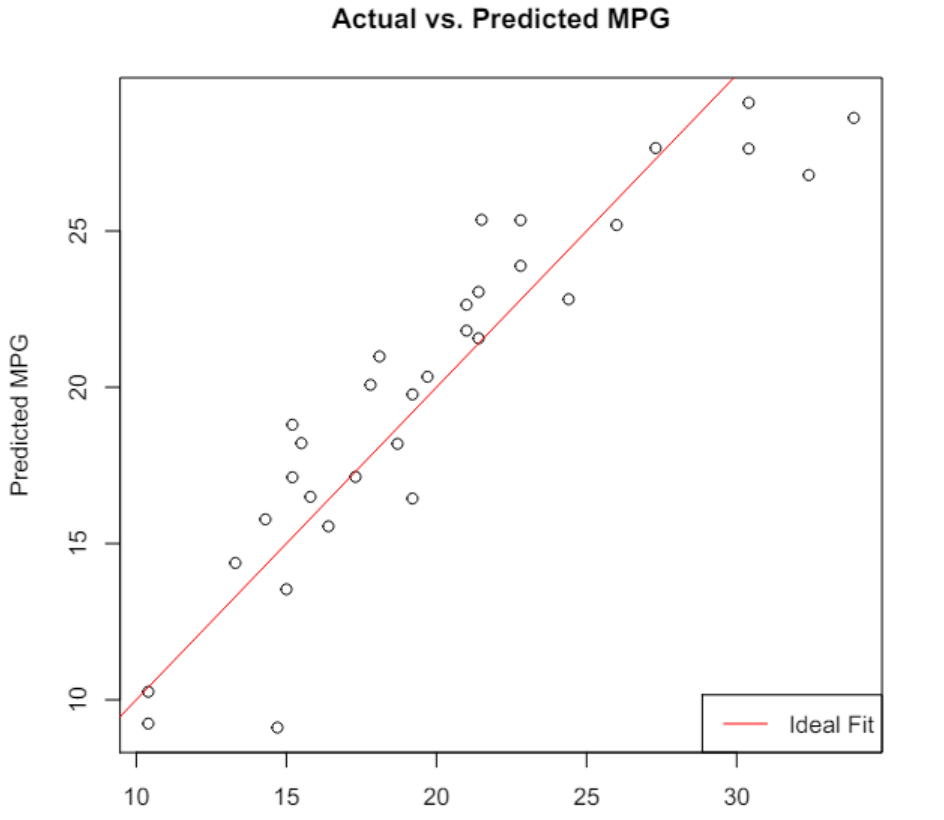
Here,
- y is a response variable.
- b0, b1, b2...bn are the coefficients.
- x1, x2, ...xn are the predictor variables.

Program(Code)-

```
# Load libraries
library(MASS)  # For the Boston dataset

# Load the Boston housing dataset
data(Boston)

# View the first few rows of the dataset
head(Boston)

# Fit multiple linear regression model
model <- lm(medv ~ ., data = Boston)

# Print summary of the model
summary(model)
```

```
# Predict using the model
# For example, let's predict the median house value (medv) for the first 5 observations
new_data <- Boston[1:5, ]  # Using the first 5 observations for prediction
predicted_values <- predict(model, newdata = new_data)

# Print predicted values
print(predicted_values)
```

Output-



Conclusion-

1. Equation for multiple linear regression is _____

$y=\beta_0+\beta_1x_1+\beta_2x_2+\ldots+\beta_nx_n+\varepsilon$

2. When there is only one dependent variable and multiple independent variable then this types of regression is known as_____

When there is only one dependent variable and multiple independent variables, this type of regression is known as multiple linear regression.

3. How to check inbuilt dataset in R/Python programming?

Both R and Python offer numerous inbuilt datasets that can be used for learning, testing, and demonstrating various data analysis and machine learning techniques. Exploring these datasets can provide valuable insights and help in understanding different aspects of data analysis and modeling. Whether you're using R or Python, the availability of inbuilt datasets makes it convenient to practice and experiment with data manipulation, visualization, statistical analysis, and machine learning algorithms