Multiple Regression

```
# Load the dataset and select specific columns
input <- mtcars[, c("mpg", "disp", "hp", "wt")]</pre>
# Print the first few rows of the dataset
print(head(input))
# Create the relationship model
model \leftarrow lm(mpg \sim disp + hp + wt, data = input)
# Show the model
print(model)
# Get the Intercept and coefficients as vector elements
cat("### The Coefficient Values ###\n")
a <- coef(model)[1]
b <- coef(model)[2]
c <- coef(model)[3]</pre>
d <- coef(model)[4]</pre>
cat("Intercept:", a, "\n")
cat("disp:", b, "\n")
cat("hp:", c, "\n")
cat("wt:", d, "\n")
# Show a detailed summary of the model
summary(model)
```

```
🍯 🔚 🛮 🌃 Import Dataset 🔻 🎱 160 MiB 🔻 🎻
   ole Terminal × Background Jobs ×
                                                                                                        R 🕶 🧠 Global Environment 🕶
                                                                                                        Data
 # Show a detailed summary of the model summary(model)
                                                                                                                                 32 obs. of 4 variables
                                                                                                        • input
                                                                                                        ● model
                                                                                                                                 List of 12
List of 12
                                                                                                        •relation
                                                                                                        Values
lm(formula = mpg ~ disp + hp + wt, data = input)
                                                                                                                                 Named num 37.1
esiduals:
                                                                                                                                 Named num -0.000937
Min 1Q Median 3Q Max
-3.891 -1.640 -0.172 1.061 5.861
                                                                                                                                 Named num -0.0312
'table' int [1:3, 1:6] 2 9 5 4 7 0 7 11 4 0 ...
                                                                                                          car.data
                                                                                                                                Named num -3.8
Named num [1:32] 23.6 22.6 25.3 21.2 18.2 ...
oefficients:
                                                                                                          predicted_mpg
              (Intercept) 37.105505
disp -0.000937
                                                                                                         Files Plots Packages Help Viewer Presentation

Zoom Export - Viewer Presentation
              -0.031157
-3.800891
                                                                                                                                        Actual vs Predicted mpg
 ignif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
                                                                                                             30
Residual standard error: 2.639 on 28 degrees of freedom
Multiple R-squared: 0.8268, Adjusted R-squared: 0.8083
F-statistic: 44.57 on 3 and 28 DF, p-value: 8.65e-11
                                                                                                                                25
                                                                                                        Predicted MPG
                                                                                                             20
 15
                                                                                                             0
                                                                                                                  10
                                                                                                                                 15
                                                                                                                                               20
                                                                                                                                                             25
 # Add a diagonal line for reference (y = x \text{ line}) abline(a=0, b=1, col="blue")
                                                                                                                                                Actual MPG
```