```
# Multiple Linear Regression
> ## Kelompok 3
> ## Ryan F F H - 2C2220007
> ## Betrand D - 2C2220001
> ## Lifa M - 2C2220014
>
> # Data
> data <- data.frame(
+    y = c(25.5, 31.2, 25.9, 38.4, 18.4, 26.7, 26.4, 25.9, 32, 25.2, 39.7, 35.7,
26.5),
+    x1 = c(1.74, 6.32, 6.22, 10.52, 1.19, 1.22, 4.1, 6.32, 4.08, 4.15, 10.15, 1
.72, 1.7),
+    x2 = c(5.3, 5.42, 8.41, 4.63, 11.6, 5.85, 6.62, 8.72, 4.42, 7.6, 4.83, 3.12
, 5.3),
+    x3 = c(10.8, 9.4, 7.2, 8.5, 9.4, 9.9, 8, 9.1, 8.7, 9.2, 9.4, 7.6, 8.2)
+ )
>
> print(data)
      y    x1    x2   x3
1  25.5  1.74  5.30 10.8
2  31.2  6.32  5.42  9.4
3  25.9  6.22  8.41  7.2
4  38.4 10.52  4.63  8.5
5  18.4  1.19 11.60  9.4
6  26.7  1.22  5.85  9.9
7  26.4  4.10  6.62  8.0
8  25.9  6.32  8.72  9.1
9  32.0  4.08  4.42  8.7
10 25.2  4.15  7.60  9.2
11 39.7 10.15  4.83  9.4
12 35.7  1.72  3.12  7.6
13 26.5  1.70  5.30  8.2
>
> # Regression Model
> model <- lm(y ~ x1 + x2 + x3, data)
> model

Call:
lm(formula = y ~ x1 + x2 + x3, data = data)

Coefficients:
(Intercept)           x1           x2           x3
    39.1573       1.0161      -1.8616      -0.3433

>
> # Summary
> summary(model)

Call:
lm(formula = y ~ x1 + x2 + x3, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-1.8532 -1.4495 -0.3219  0.5919  3.2121
```

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  39.1573     5.8871   6.651 9.36e-05 ***
x1            1.0161     0.1909   5.323 0.000479 ***
x2           -1.8616     0.2673  -6.964 6.58e-05 ***
x3           -0.3433     0.6171  -0.556 0.591572
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.073 on 9 degrees of freedom
Multiple R-squared:  0.9117,    Adjusted R-squared:  0.8823
F-statistic: 30.98 on 3 and 9 DF,  p-value: 4.496e-05


>
> # Prediction
> new_data <- data.frame(
+    const = 1,
+    x1 = c(3),
+    x2 = c(8),
+    x3 = c(9)
+ )
>
> # Predict with Confidence Interval
> predictions <- predict(model, newdata = new_data, interval = "prediction")
> predictions_summary <- cbind(new_data, predictions)
> print(predictions_summary)
  const x1 x2 x3      fit      lwr      upr
1     1  3  8  9 24.22311 19.22468 29.22154
>
> # ANOVA
> anova_table <- data.frame(
+    Sumber = c("Regression", "Residual", "Total"),
+    DK = c(length(model$coefficients) - 1, length(model$residuals) - length(mod
el$coefficients), length(model$residuals) - 1),
+    JK = c(
+      sum((fitted(model) - mean(data$y))^2),
+      sum(residuals(model)^2),
+      sum((data$y - mean(data$y))^2)
+    ),
+    RJK = c(
+      sum((fitted(model) - mean(data$y))^2) / (length(model$coefficients) - 1),
+      sum(residuals(model)^2) / (length(model$residuals) - length(model$coeffic
ients)),
+      sum((data$y - mean(data$y))^2) / (length(model$residuals) - 1)
+    ),
+    F = c(
+      (sum((fitted(model) - mean(data$y))^2) / (length(model$coefficients) - 1)
) / (sum(residuals(model)^2) / (length(model$residuals) - length(model$coeffici
ents))),
+      NA,
+      NA
+    )
+ )
>
> print(anova_table)
```

	Sumber	DK	JK	RJK	F
1	Regression	3	399.4544	133.151456	30.98435
2	Residual	9	38.6764	4.297378	NA
3	Total	12	438.1308	36.510897	NA