```
> ## ====================================
> ##  Model : Y = b0 + b1 X1 + b2 X2 + b3 X3
> ## ====================================

> LM5 = lm ( y ~ x1 + x2 + x3 )
> summary(LM5)

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

Residuals:
    Min      1Q  Median      3Q     Max
-3.7263 -1.6111  0.3923  1.4656  4.1277

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  117.085     99.782   1.173    0.258
x1 |X2, X3     4.334      3.016   1.437    0.170
x2 |X1, X3    -2.857      2.582  -1.106    0.285
x3 |X1, X2    -2.186      1.595  -1.370    0.190

Residual standard error: 2.48 on 16 degrees of freedom
Multiple R-Squared: 0.8014,  Adjusted R-squared: 0.7641
F-statistic: 21.52 on 3 and 16 DF,  p-value: 7.343e-06

> anova(LM5)
Analysis of Variance Table

Response: y
          Df Sum Sq Mean Sq F value    Pr(>F)
x1         1 352.27  352.27 57.2768 1.131e-06 ***
x2 |X1     1  33.17   33.17  5.3931   0.03373 *
x3 |X1, X2 1  11.55   11.55  1.8773   0.18956
Residuals 16  98.40    6.15
---

> LM6 = lm (y ~ x3 + x1 + x2 )
> anova(LM6)
Analysis of Variance Table

Response: y
          Df Sum Sq Mean Sq F value    Pr(>F)
x3         1  10.05   10.05  1.6343    0.2193
x1 |X3     1 379.40  379.40 61.6886 7.034e-07 ***
x2 |X3,X1  1   7.53    7.53  1.2242    0.2849
Residuals 16  98.40    6.15
---

> LM7 = lm (y ~ x3 + x2 + x1 )
> anova(LM7)
Analysis of Variance Table

Response: y
          Df Sum Sq Mean Sq F value    Pr(>F)
x3         1  10.05   10.05  1.6343    0.2193
x2 |X3     1 374.23  374.23 60.8471 7.684e-07 ***
x1 |X3,X2  1  12.70   12.70  2.0657    0.1699
Residuals 16  98.40    6.15
---
```

$1.437^2 \neq 57.2768$

$(-1.370)^2 = 1.877$

$T_3^2 = \left[\frac{\hat{\beta}_3}{SE(\hat{\beta}_3)}\right]^2 = \frac{SSR(X_3|X_1,X_2)/1}{MSE(X_1,X_2,X_3)} = \frac{11.55}{6.15} = 1.878\cdots$

N.B: $(-1.106)^2 = 1.2242$.

$= T_2^2 = \left[\frac{\hat{\beta}_2}{SE(\hat{\beta}_2)}\right]^2 = \frac{SSR(X_2|X_1,X_3)/1}{MSE(X_1,X_2,X_3)}$

$= \frac{7.53}{6.15} = 1.2242$

$= T_1^2 = \left[\frac{\hat{\beta}_1}{SE(\hat{\beta}_1)}\right]^2 = \frac{SSR(X_1|X_2,X_3)/1}{MSE(X_1,X_2,X_3)}$

$= \frac{12.70}{6.15} = 2.0657$

N.B: $(1.437)^2 = 2.0657\cdots$

SST: 19 459.39

459.38

rounding error

MSE

$SSR(X_3|X_1,X_2)/1$

$SSR(X_2|X_1,X_3)/1$

$SSR(X_1|X_2,X_3)/1$