

**Latihan Halaman 222-223**

**ESTIMASI MODEL 1 :  $CHOL = 203.123 + 0.127 TRIG$**

**ANOVA<sup>b</sup>**

| Model |            | Sum of Squares | df | Mean Square | F     | Sig.              |
|-------|------------|----------------|----|-------------|-------|-------------------|
| 1     | Regression | 1181.676       | 1  | 1181.676    | 1.850 | .181 <sup>a</sup> |
|       | Residual   | 27464.768      | 43 | 638.716     |       |                   |
|       | Total      | 28646.444      | 44 |             |       |                   |

a. Predictors: (Constant), trigliserida

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model |              | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|--------------|-----------------------------|------------|---------------------------|--------|------|
|       |              | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)   | 203.123                     | 17.156     |                           | 11.840 | .000 |
|       | trigliserida | .127                        | .093       | .203                      | 1.360  | .181 |

a. Dependent Variable: cholesterol

**ESTIMASI MODEL 2 :  $CHOL = 204.048 + 0.445 UMUR$**

**ANOVA<sup>b</sup>**

| Model |            | Sum of Squares | df | Mean Square | F     | Sig.              |
|-------|------------|----------------|----|-------------|-------|-------------------|
| 1     | Regression | 655.625        | 1  | 655.625     | 1.007 | .321 <sup>a</sup> |
|       | Residual   | 27990.819      | 43 | 650.949     |       |                   |
|       | Total      | 28646.444      | 44 |             |       |                   |

a. Predictors: (Constant), umur

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|--------------|-----------------------------|------------|---------------------------|-------|------|
|              | B                           | Std. Error | Beta                      |       |      |
| 1 (Constant) | 204.048                     | 22.093     |                           | 9.236 | .000 |
| Umur         | .445                        | .444       | .151                      | 1.004 | .321 |

a. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|--------------|-----------------------------|------------|---------------------------|--------|------|
|              | B                           | Std. Error | Beta                      |        |      |
| 1 (Constant) | 203.123                     | 17.156     |                           | 11.840 | .000 |
| triglicerida | .127                        | .093       | .203                      | 1.360  | .181 |

a. Dependent Variable: cholesterol

**ESTIMASI MODEL 3 : CHOL = 217.420 + 0.003 UMQS**

**ANOVA<sup>b</sup>**

| Model        | Sum of Squares | df | Mean Square | F    | Sig.              |
|--------------|----------------|----|-------------|------|-------------------|
| 1 Regression | 396.227        | 1  | 396.227     | .603 | .442 <sup>a</sup> |
| Residual     | 28250.217      | 43 | 656.982     |      |                   |
| Total        | 28646.444      | 44 |             |      |                   |

a. Predictors: (Constant), umur kuadrat

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model | Unstandardized Coefficients |            | Standardized Coefficients | t | Sig. |
|-------|-----------------------------|------------|---------------------------|---|------|
|       | B                           | Std. Error | Beta                      |   |      |

|   |              |         |        |      |        |      |
|---|--------------|---------|--------|------|--------|------|
| 1 | (Constant)   | 217.420 | 11.555 |      | 18.816 | .000 |
|   | umur kuadrat | .003    | .004   | .118 | .777   | .442 |

a. Dependent Variable: cholesterol

**ESTIMASI MODEL 4 : CHOL = 192.155 + 0.292 UM + 0.108 TRIG**

**ANOVA<sup>b</sup>**

| Model        | Sum of Squares | df | Mean Square | F     | Sig.              |
|--------------|----------------|----|-------------|-------|-------------------|
| 1 Regression | 1437.719       | 2  | 718.860     | 1.110 | .339 <sup>a</sup> |
| Residual     | 27208.725      | 42 | 647.827     |       |                   |
| Total        | 28646.444      | 44 |             |       |                   |

a. Predictors: (Constant), trigliserida, umur

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|--------------|-----------------------------|------------|---------------------------|-------|------|
|              | B                           | Std. Error | Beta                      |       |      |
| 1 (Constant) | 192.155                     | 24.554     |                           | 7.826 | .000 |
| Umur         | .292                        | .464       | .099                      | .629  | .533 |
| trigliserida | .108                        | .098       | .173                      | 1.099 | .278 |

a. Dependent Variable: cholesterol

**ESTIMASI MODEL 5 : CHOL = - 25.670 + 9.838 UM - 0.093 UMQS**

**ANOVA<sup>b</sup>**

| Model        | Sum of Squares | df | Mean Square | F     | Sig.              |
|--------------|----------------|----|-------------|-------|-------------------|
| 1 Regression | 3678.335       | 2  | 1839.167    | 3.094 | .056 <sup>a</sup> |
| Residual     | 24968.110      | 42 | 594.479     |       |                   |
| Total        | 28646.444      | 44 |             |       |                   |

a. Predictors: (Constant), umur kuadrat, umur

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model |              | Unstandardized Coefficients |            | Standardized Coefficients | T      | Sig. |
|-------|--------------|-----------------------------|------------|---------------------------|--------|------|
|       |              | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)   | -25.670                     | 104.039    |                           | -.247  | .806 |
|       | umur         | 9.838                       | 4.187      | 3.342                     | 2.350  | .024 |
|       | umur kuadrat | -.093                       | .041       | -3.207                    | -2.255 | .029 |

a. Dependent Variable: cholesterol

**ESTIMASI MODEL 6 : CHOL = - 21.969 + 9.220 UM + 0.079 TRIG - 0.088 UMQS**

**ANOVA<sup>b</sup>**

| Model |            | Sum of Squares | df | Mean Square | F     | Sig.              |
|-------|------------|----------------|----|-------------|-------|-------------------|
| 1     | Regression | 4086.344       | 3  | 1362.115    | 2.274 | .094 <sup>a</sup> |
|       | Residual   | 24560.100      | 41 | 599.027     |       |                   |
|       | Total      | 28646.444      | 44 |             |       |                   |

a. Predictors: (Constant), umur kuadrat, trigliserida, umur

b. Dependent Variable: cholesterol

**Coefficients<sup>a</sup>**

| Model |              | Unstandardized Coefficients |            | Standardized Coefficients | T      | Sig. |
|-------|--------------|-----------------------------|------------|---------------------------|--------|------|
|       |              | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant)   | -21.969                     | 104.532    |                           | -.210  | .835 |
|       | umur         | 9.220                       | 4.269      | 3.132                     | 2.160  | .037 |
|       | trigliserida | .079                        | .095       | .126                      | .825   | .414 |
|       | umur kuadrat | -.088                       | .042       | -3.035                    | -2.103 | .042 |

a. Dependent Variable: cholesterol

Kita lakukan uji parsial F seperti berikut (berdasarkan hasil-hasil yang sudah kita lakukan diatas)

ANOVA Tabel untuk TRIG dengan CHOL dan UM , UMSQ

| Sumber          | Df | SS        | MS       | F       | $r^2$ |
|-----------------|----|-----------|----------|---------|-------|
| X1              | 1  | 1181.676  | 1181.676 | 1.97266 | 0.143 |
| Regresi X2   X1 | 1  | 1.21668   | 1.21668  | 0.00203 |       |
| X3   X1, X2     | 1  | 2.84224   | 2.84224  | 0.00474 |       |
| Residual        | 41 | 24560.100 | 599.027  |         |       |
| Total           | 44 | 28646.444 |          |         |       |

Nilai F untuk penambahan independent variabel  $X_3 = 0.00474 < F 4.08$  ini berarti hipotesa  $H_0 : \beta_3 = 0$  diterima atau gagal ditolak artinya penambahan third order ( $X^3$ ) tidak secara bermakna dapat memprediksi Y.

Kita bersimpulan bahwa :

- Penambahan “ second order” sesuai (fit) dengan nilai  $r^2 = 0.128$
- Penambahan nilai  $r^2$  menjadi 0.143 pada “ thind order” hanya sebesar 0.015 adalah kecil
- Kurva yang ada cukup diterangkan dengan “second order”

## TUGAS HALAMAN 223

| Source            | df | SS         | MS         | F        |
|-------------------|----|------------|------------|----------|
| X                 | 1  | 174.473,96 | 174.473,96 | 429,1691 |
| Regresi $X^2$   X | 1  | 10.515,44  | 10515,44   | 25,8658  |
| $X^3$   X, $X^2$  | 1  | 415,19     | 415,19     | 1,02128  |
| Residual          | 15 | 6098,08    | 406,539    |          |
| Total             | 18 | 190.502,93 |            |          |

Model regresi :

Model estimasi 1 :  $Y = - 122.345 + 6.227 X$

Model estimasi 2 :  $Y = 32.091 - 3.051 X + 0.1176 X^2$

Model estimasi 3 :  $Y = 114.621 - 10.620 X + 0.3247 X^2 + 0.00173 X^3$

Jawaban :

$$1. \text{ Nilai } r^2 : \frac{(SSY - SSE)}{SSY} = \frac{174473.96}{190502.93} = 0.916$$

2. Nilai  $r^2_2 : \frac{(SSY-SSE)}{SSY} = \frac{10515.44}{190502.93} = 0.055$

3. Nilai  $r^2_3 : \frac{(SSY-SSE)}{SSY} = \frac{415.19}{190502.93} = 0.00218$

4. Nilai F model estimasi 1:  $429.19 > F$  tabel 4.54, maka kesimpulan perubahan penambahan independen variabel X secara bermakna meningkatkan prediksi Y.

5. Nilai F model estimasi 2 :  $25.87 > F$  tabel 4.54, maka kesimpulan perubahan penambahan independen variabel  $X^2$  secara bermakna meningkatkan prediksi Y.

6. Nilai F model estimasi 3 :  $1.02 > F$  tabel 4.54, maka kesimpulan perubahan penambahan independen variabel X tidak secara bermakna meningkatkan prediksi Y.

7. Model yang terbaik  $Y = -122.345 + 6.227 X$