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TUGAS
PENGENALAN POLA

1.

x	y
2	20
3	25
4	32
7	65
5	41
9	97
10	116
11	137
13	185
6	52

Dapat diselesaikan dengan regresi polinomial berderajat 2

Persamaan : $y = a_0 + a_1 x + a_2 x^2 + e$

Rumus dasar :

$$(n)a_0 + (\sum x_i)a_1 + (\sum x_i^2)a_2 = \sum y_i$$
$$(\sum x_i)a_0 + (\sum x_i^2)a_1 + (\sum x_i^3)a_2 = \sum x_i y_i$$
$$(\sum x_i^2)a_0 + (\sum x_i^3)a_1 + (\sum x_i^4)a_2 = \sum x_i^2 y_i$$

Diketahui :

$m = 2$ $\quad \bar{x} = 7$ $\quad \sum x_i = 70$ $\quad \sum x_i^2 = 610$

$n = 10$ $\quad \bar{y} = 77$ $\quad \sum y_i = 770$ $\quad \sum x_i^3 = 6040$

$\sum x_i^4 = 64438$ $\quad \sum x_i y_i = 7160$

$\sum x_i^2 y_i = 74198$

Matriks :

$$\begin{bmatrix} 10 & 70 & 610 \\ 70 & 610 & 6040 \\ 610 & 6040 & 64438 \end{bmatrix} \begin{Bmatrix} a_0 \\ a_1 \\ a_2 \end{Bmatrix} = \begin{Bmatrix} 770 \\ 7160 \\ 74198 \end{Bmatrix}$$

$$\left[\begin{array}{ccc|c} 10 & 70 & 610 & 770 \\ 0 & 120 & 1770 & 1770 \\ 610 & 6040 & 64438 & 74198 \end{array}\right] \quad R_2 + (-7)R_1$$

$$\left[\begin{array}{ccc|c} 10 & 70 & 610 & 770 \\ 0 & 120 & 1770 & 1770 \\ 0 & 1770 & 27228 & 27228 \end{array}\right] \quad R_3 + (-61)R_1$$

$$\left[\begin{array}{ccc|c} 10 & 70 & 610 & 770 \\ 0 & 120 & 1770 & 1770 \\ 0 & 0 & 1120{,}5 & 1120{,}5 \end{array}\right] \quad R_3 + (-14{,}75)R_2$$

$1120{,}5\,a_2 = 1120{,}5$

$a_2 = 1$

$120a_1 + 1770a_2 = 1776$

$120a_1 + 1770(1) = 1770$

$120a_1 + 1776 = 1770$

$120a_1 = 0$

$a_1 = 0$

$10a_0 + 70a_1 + 610a_2 = 770$

$10a_0 + 70(0) + 610(1) = 770$

$10a_0 + 0 + 610 = 770$

$10a_0 = 160$

$a_0 = 16$

Persamaan yang dihasilkan: $y = 16 + x^2$ //