Data Minimal

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▷ Regresi Linier Berganda

Umur (hari)	Berat (ons)	Panjang (cm)
X_1	X_2	Y
10	31	50
90	30	58
90	28	65
50	29	60
70	32	64
20	30	55
80	27	66
30	32	56
0	33	50
60	29	64

Penyelesaian :
1. Persamaan Regresi
2. Panjang rata² bayi berumur 100 hari dgn berat 35 ons

▷ Penyelesaian

No	X_1	X_2	Y	X_1Y	X_2Y	X_1X_2	X_1^2	X_2^2
1	10	31	50	500	1550	310	100	961
2	90	30	58	2320	1740	1200	1600	900
3	90	28	65	5850	1820	2520	8100	784
4	50	29	60	3000	1740	1450	2500	841
5	70	32	64	4480	2048	2240	4900	1024
6	20	30	55	1100	1650	600	400	900
7	80	27	66	5280	1782	2160	6400	729
8	30	32	56	1680	1792	960	900	1024
9	0	33	50	0	1650	0	0	1089
10	60	29	64	3840	1856	1740	3600	841
Total	450	301	588	28050	17628	13180	28500	9093

P Sistem Persamaan

$$\Sigma Y = an + b_1 \Sigma X_1 + b_2 \Sigma X_2$$
$$\Sigma X_1 Y = a\Sigma X_1 + b_1 \Sigma X_1^2 + b_2 \Sigma X_1 X_2$$
$$\Sigma X_2 Y = a\Sigma X_2 + b_1 \Sigma X_1 X_2 + b_2 \Sigma Y_2^2$$

⇒

$588 = 10a + 450b + 301 b_2$ (Pers1)
$28050 = 450a + 28500 b_1 + 13180 b_2$ (Pers2)
$17628 = 301a + 13180 b_1 + 9093 b_2$ (Pers3)

ID Eliminasi variabel

1 => Persamaan (1) dan (2)

588 = 10a + 950 b_1 + 301 b_2 | x 95

28050 = 950 a + 28500 b_1 + 13180 b_2 | x 1

=> 26460 = 950 a + 20250 b_1 + 13.595 b_2

28050 = 950 a + 28500 b_2 + 13.180 b_2 -

-1590 = -8250 b_1 + 365 b_2 (Pers 4)

2 => Persamaan (1) dan (3)

588 = 10a + 950 b_1 + 301 b_2 | x 301

17628 = 301 a + 1380 b_1 + 9093 b_2 | x 10

=> 176.988 = 3010 a + 135950 b_1 + 90601 b_2

176.280 = 3010 a + 131860 b_1 + 89930 b_2 -

708 = 3650 b_1 + (-329) b_2 (Pers 5)

3 => Persamaan (4) dan (5)

-1590 = -8250 b_1 + 365 b_2 | x (-73)

708 = 3650 b_1 + (-329) b_2 | x (165)

=> 116070 = 602250 b_1 + (-26645) b_2

116820 = 602250 b_1 + (-54.285) b_2 -

-750 = 27640 b_2

$\frac{-750}{27640}$ = b_2

-0,0271 = b_2

4 => Memasukkan nilai b_2 (-0,0271) ke Persamaan (4) atau (5)

708 = 3650 b_1 + (-329) (-0,0271)

708 = 3650 b_1 + 8,9159

708 - 8,9159 = 3650 b_1

699,0841 = 3650 b_1

$\frac{699,0841}{3650}$ = b_1

0,1915 = b_1

⇒ memasukkan nilai b_1 dan b_2 ke dalam persamaan (1), (2) / (3)

$588 = 10a + 950\,b_1 + 301\,b_2$

$588 = 10a + 950\,(0,1915) + 301\,(-0,0271)$

$588 = 10a + 86,175 + (-8,1571)$

$588 = 10a + 78,024$

$588 - 78,024 = 10a$

$509,976 = 10a$

$\frac{509,976}{10} = a$

$50,9976 = a$

1. Persamaan Regresi

Konstanta $a = 50,9976$

Koef Regresi $b_1 = 0,1915$

Koef Regresi $b_2 = (-0,0271)$

Sehingga → $Y = a + b_1 X_1 + b_2 X_2$

$Y = 50,9976 + 0,1915\,X_1 + (-0,0271)\,X_2$

2. Panjang Pasir bayi berumur 100 hari dgn berat 35 ons

$X_1 = 100$

$X_2 = 35$

$Y = 50,9976 + 0,1915\,X_1 + (-0,0271)\,X_2$

$Y = 50,9976 + 0,1915\,(100) + (-0,0271)\,(35)$

$= 69,1991$

Jadi Panjang Pasir bayi adalah 69,1991 cm