

CHAPTER 1_2

MENCARI MATRIK VARIAN DAN KOVARIAN

CONTOH

- AKAN DIBENTUK MATRIK VARIAN DARI

x_1	x_2
1	1
3	4
2	7
$\bar{x}_1 = 2$	$\bar{x}_2 = 4$

- BENTUK

$$\mathbf{X}_d = \begin{bmatrix} 1 & 1 \\ 3 & 4 \\ 2 & 7 \end{bmatrix} - \begin{bmatrix} 2 & 4 \\ 2 & 4 \\ 2 & 4 \end{bmatrix}$$

DIPEROLEH

$$\mathbf{X}_d = \begin{bmatrix} -1 & -3 \\ 1 & 0 \\ 0 & 3 \end{bmatrix}$$

- CARI TRANSPOSE

$$\mathbf{X}'_d = \begin{bmatrix} -1 & 1 & 0 \\ -3 & 0 & 3 \end{bmatrix}$$

- DIPEROLEH JUMLAH KUADRAT DAN KALI SILANG (SUMS OF SQUARES AND CROSS PRODUCTS=SSCP)

Deviation scores for x_1 X'_d X_d Deviation scores for x_2

$$SSCP = \begin{bmatrix} -1 & 1 & 0 \\ -3 & 0 & 3 \end{bmatrix} \begin{bmatrix} -1 & -3 \\ 1 & 0 \\ 0 & 3 \end{bmatrix} = \begin{bmatrix} SS_1 & SS_{12} \\ SS_{21} & SS_2 \end{bmatrix}$$

$$SS_{12} = SS_{21} = (-1)(-3) + 1(0) + (0)(3) = 3$$

- ELEMEN DIAGONAL

$$SS_1 = (-1)^2 + 1^2 + 0^2 = 2$$

$$SS_2 = (-3)^2 + 0^2 + 3^2 = 18$$

INGAT!!

$$s^2 = \sum_i (x_{ii} - \bar{x})^2 / (n-1).$$

SO

$$s_{12} = \frac{\sum_{i=1}^n (x_{i1} - \bar{x}_1)(x_{i2} - \bar{x}_2)}{n-1},$$

JADI

$$S = \frac{SSCP}{n-1}$$

$$S = \frac{1}{2} \begin{bmatrix} 2 & 3 \\ 3 & 18 \end{bmatrix} = \begin{bmatrix} 1 & 1.5 \\ 1.5 & 9 \end{bmatrix}$$

Variance for variable 1

Variance for variable 2

Covariance