

TUGAS PERTEMUAN 9
STATISTIKA DAN PROBABILITAS
KEMIRINGAN & KERUNCINGAN DISTRIBUSI DATA



Disusun oleh:

Rama Pramudya Wibisana

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PROGRAM STUDI SISTEM INFORMASI

FAKULTAS INFORMATIKA

UNIVERSITAS BINA INSANI

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SOAL

38	67	85	95	96	76	125	150	158	120
38	36	47	49	89	70	120	80	85	93

Hitung kemiringan distribusi data dan keruncingan distribusi data!

PENYELESAIAN :

- **Kemiringan Data (Bowley)**

36	38	38	47	49	67	70	76	80	85
85	89	93	95	96	120	120	125	150	158

Kuartil 1

$$Q_1 = X \left(\frac{n+2}{4} \right)$$

$$Q_1 = X \left(\frac{20+2}{4} \right)$$

$$Q_1 = X \left(\frac{22}{4} \right)$$

$$Q_1 = X 5,5$$

$$Q_1 = \frac{49 + 67}{2} = 58$$

Kuartil 2

$$Q_2 = \frac{X \left(\frac{n}{2} \right) + X \left(\frac{n}{2} + 1 \right)}{2}$$

$$Q_2 = \frac{X \left(\frac{20}{2} \right) + X \left(\frac{20}{2} + 1 \right)}{2}$$

$$Q_2 = \frac{X 10 + X 11}{2}$$

$$Q_2 = \frac{85 + 85}{2} = 85$$

Kuartil 3

$$Q_3 = X \left(\frac{3n+2}{4} \right)$$

$$Q_3 = X \left(\frac{3 \cdot 20 + 2}{4} \right)$$

$$Q_3 = X \left(\frac{62}{4} \right)$$

$$Q_3 = X 15,5$$

$$Q_3 = \frac{96 + 120}{2} = 108$$

$$\alpha = \frac{Q_3 + Q_1 - Q_2}{Q_3 - Q_1}$$

$$\alpha = \frac{108 + 58 - 85}{108 - 58}$$

$$\alpha = \frac{81}{50} = \mathbf{1,62}$$

- **Keruncingan Data**

$$\bar{X} = \frac{36 + 38 + 38 + 47 + 49 + 67 + 70 + 76 + 80 + 85 + 85 + 89 + 93 + 95 + 96 + 120 + 120 + 125 + 150 + 158}{20}$$

$$\bar{X} = 85,85$$

X_i	\bar{X}	$(X_i - \bar{X})$	$(X_i - \bar{X})^2$	$(X_i - \bar{X})^4$
36	85,85	49,85	2.485,02	6.175.336,82
38	85,85	47,85	2.289,62	5.242.371,19
38	85,85	47,85	2.289,62	5.242.371,19
47	85,85	38,85	1.509,32	2.278.054,40
49	85,85	36,85	1.357,92	1.843.953,51
67	85,85	18,85	355,32	126.254,07
70	85,85	15,85	251,22	63.112,74
76	85,85	9,85	97,02	9.413,36
80	85,85	5,85	34,22	1.171,17
85	85,85	0,85	0,72	0,52
85	85,85	0,85	0,72	0,52
89	85,85	3,15	9,92	98,45
93	85,85	7,15	51,12	2.613,51
95	85,85	9,15	83,72	7.009,45
96	85,85	10,15	103,72	10.613,63
120	85,85	34,15	1.166,22	1.360.074,91
120	85,85	34,15	1.166,22	1.360.074,91
125	85,85	39,15	1.153,72	2.349.238,26
150	85,85	64,15	4.155,22	16.935.056,22
158	85,85	72,15	5.205,62	27.098.505,61

$$\begin{aligned}\Sigma(X_i - \bar{X})^2 &= 23.766,20 \\ \Sigma(X_i - \bar{X})^4 &= 70.105.323,40\end{aligned}$$

Standar Deviasi

$$\begin{aligned}S &= \sqrt{\frac{\Sigma(X_i - \bar{X})^2}{n}} \\ S &= \sqrt{\frac{23.766,20}{20}} \\ S &= \sqrt{1.188,31} \\ S &= 34,47\end{aligned}$$

$$S^4 = (34,47)^4 = 1.411.773,85$$

Masukan rumus keruncingan

$$\begin{aligned}\alpha &= \frac{\Sigma(X_i - \bar{X})^4}{nS^4} \\ \alpha &= \frac{70.105.323,40}{20 * 1.411.773,85} \\ \alpha &= \frac{70.105.323,40}{28.235.477} \\ \alpha &= \mathbf{2,48}\end{aligned}$$

JAWABAN :

- Kemiringan Distribusi Data = 1,62
- Keruncingan Distribusi Data = 2,48