

RUMUS LAIN SIMPANGAN BAKU ¹

Diketahui rumus simpangan baku berdasar definisi: $S = \sqrt{\frac{\sum f_i (x_i - \bar{x})^2}{\sum f_i}}$,

jika $(x_i - \bar{x})^2$ kita kuadratkan, diperoleh:

$$\begin{aligned}\frac{\sum f_i (x_i - \bar{x})^2}{\sum f_i} &= \frac{\sum f_i [(x_i)^2 - 2x_i \bar{x} + (\bar{x})^2]}{\sum f_i} \\ &= \frac{\sum f_i (x_i)^2}{\sum f_i} - \frac{2 \sum f_i x_i \bar{x}}{\sum f_i} + \frac{\sum f_i (\bar{x})^2}{\sum f_i} \\ &= \overline{x_i^2} - 2\bar{x} \cdot \bar{x} + \frac{(\bar{x})^2 \sum f_i}{\sum f_i} \\ &= \overline{x_i^2} - 2\bar{x} \cdot \bar{x} + (\bar{x})^2 \\ &= \overline{x_i^2} - 2(\bar{x})^2 + (\bar{x})^2 \\ &= \overline{x_i^2} - (\bar{x})^2\end{aligned}$$

$$(\bar{x})^2 = \text{konstanta}$$

Jadi, $S = \sqrt{\overline{x_i^2} - (\bar{x})^2}$ dengan $\overline{x_i^2} = \frac{\sum f_i (x_i)^2}{\sum f_i}$