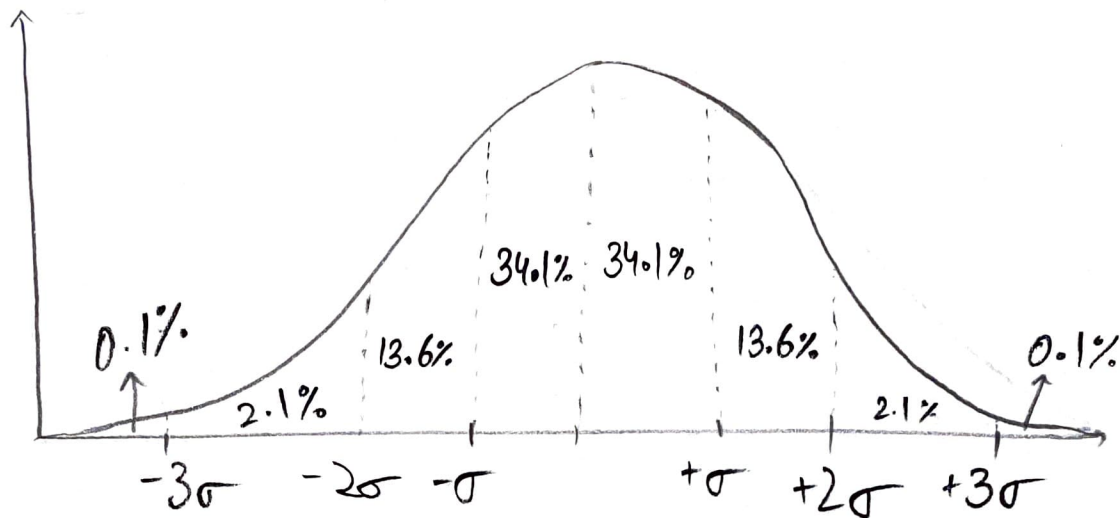


# Standard deviation



$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

Data = 1, 2, 3, 4, 5

$$\bar{x} = \frac{1+2+3+4+5}{5} = \frac{15}{5} = 3$$

$$\sum (x - \bar{x})^2$$

$$\begin{array}{l|l} x=1 \Rightarrow (1-3)^2 = 4 & x=3 \Rightarrow (3-3)^2 = 0 \\ x=2 \Rightarrow (2-3)^2 = 1 & x=4 \Rightarrow (4-3)^2 = 1 \\ & x=5 \Rightarrow (5-3)^2 = 4 \end{array}$$

$$\sum (x - \bar{x})^2 = 4 + 1 + 0 + 1 + 4 = 10$$

$$\sigma = \sqrt{\frac{10}{5-1}} = \sqrt{\frac{10}{4}} = \sqrt{\frac{5}{2}} = 1.58$$

$$\sigma = \sqrt{\frac{(3.6)^2 + (1.6)^2 \times 2 + 0}{4}}$$

$$= \sqrt{\frac{(12.96 + 2.56) \times 2 + 0}{4}} = 2.78$$

$$\begin{aligned} \bar{x} &= \frac{0+2+4+5+7}{5} \\ &= \frac{18}{5} = 3.6 \end{aligned}$$