

Suppose our dataset contains N data points x_1, \dots, x_N . The mean (average) of the dataset is,

$$\mu = \frac{1}{N} \sum_{i=1}^N x_i = \frac{x_1 + \dots + x_N}{N}.$$

The variance is then found as,

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2 = \frac{(x_1 - \mu)^2 + \dots + (x_N - \mu)^2}{N}.$$

The standard deviation is simply $\sigma = \sqrt{\sigma^2}$.

In the example with hot/cold water buckets, we had $N = 2$ points.