

Population and Sample Variance and Standard Deviation Formulas

For *population* variance and standard deviation, we divide by the number of items (n in the denominator).

For *sample* variance and standard deviation, we divide by the number of items less 1 ($n-1$ in the denominator).

For those who like formulas, here they are:

Population Variance

$$\sigma^2 = \frac{\sum_{i=1}^n (X_i - X_{avg})^2}{n}$$

Population Standard Deviation

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (X_i - X_{avg})^2}{n}}$$

Sample Variance

$$s^2 = \frac{\sum_{i=1}^n (X_i - X_{avg})^2}{n - 1}$$

Sample Standard Deviation

$$s = \sqrt{\frac{\sum_{i=1}^n (X_i - X_{avg})^2}{n - 1}}$$