DESCRIPTIVE STATISTICS
CHAPTERS 1-3: FORMULA SHEET

Mean (grouped data): $\bar{X} = \dfrac{\sum(f \cdot X_m)}{\sum f}$ where $\begin{cases} f = \text{class frequency} \\ X_m = \text{class midpoint} \end{cases}$

Variance (grouped data):

$$s^2 = \frac{n\left[\sum\left(f \cdot X_m^2\right)\right] - \left[\sum\left(f \cdot X_m\right)\right]^2}{n(n-1)} \quad \text{where} \begin{cases} X_m = \text{class midpoint} \\ f = \text{class frequency} \\ \bar{x} = \text{mean of data} \end{cases}$$

*for a population variance of σ^2, denominator is n^2, not n(n-1).

Weighted mean:

$$\bar{X} = \frac{\sum(w \cdot X)}{\sum w} \qquad \text{where} \begin{cases} X = \text{score or data value} \\ w = \text{relative weight of particular score} \end{cases}$$

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z-score: $z = \dfrac{x - \bar{x}}{s}$

Outliers:

1. **Find Interquartile Range (IQR) = $Q_3 - Q_1$**
2. **Lower Fence = $Q_1 - 1.5$ (IQR)**
3. **Upper Fence = $Q_3 + 1.5$ (IQR)**
4. **Outliers are "outside" of the fences**