

## STA2023: Additional set of Formulas

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$$\text{Range} = \max - \min$$

$$\text{Midrange} = \frac{\max + \min}{2}$$

$$\text{Standard Deviation rule of thumb} \approx \frac{\text{Range}}{4}$$

$$\text{Coefficient of Variation} = \frac{s}{\bar{x}} \cdot 100$$

Interquartile range, IQR:

$$\text{IQR} = Q_3 - Q_1$$

Rule to determine outliers:

A data value is an outlier if it is greater than  $Q_3 + 1.5 \cdot \text{IQR}$  or less than  $Q_1 - 1.5 \cdot \text{IQR}$

Rule of thumb for significant values:

Significantly low values  $< \min = \mu - 2\sigma$

Significantly high values  $> \max = \mu + 2\sigma$

Usual values:  $\min \leq x \leq \max$

$$\text{Z score} = \frac{x - \mu}{\sigma}; \quad \text{alternatively: } \text{Z score} = \frac{x - \mu}{\sigma/\sqrt{n}} \quad \text{By Central Limit Theorem}$$

Solving for  $x$  on the Z score formula:  $x = z \cdot \sigma + \mu$

$$\text{Percentile for a data value } x = \frac{\text{number of data values less than } x}{\text{total number of values}} \cdot 100$$

Confidence Intervals:

Point Estimate  $\pm$  Error where  $\hat{p} = \frac{x}{n}$

$\hat{p} \pm E$  for proportions

$\hat{x} \pm E$  for means

For the given interval, lower bound denoted L; upper bound, or right side, denoted R:

$$\hat{p} = \frac{R + L}{2} \quad E = \frac{R - L}{2}$$