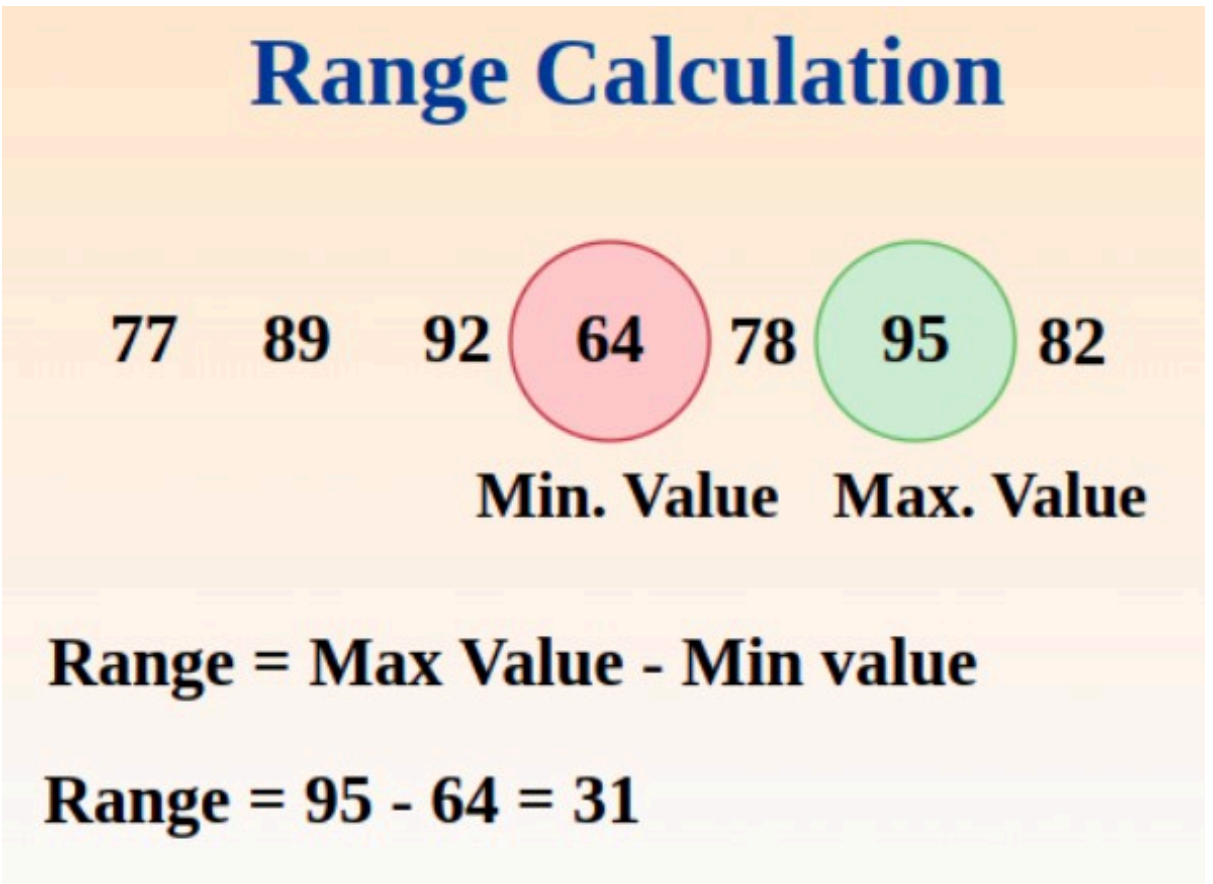
Measures of Dispersion

Adejumo Ridwan Suleiman

Range

Range

- Difference between the highest and lowest value in a set of values.



Range - limitations

- Can be influenced by extreme values
- Relies on only two extreme values
- A weak measure of variation.

Variance

Variance

- Measures the spread of numbers in a variable.
- Measures the dispersion of numbers from the mean in a dataset
- Square of standard deviations
- Mathematically represented as σ^2

Variance - Limitations

- Sensitive to outliers
- Sensitive to unit of measurements
- Assumption of normality, which is not always true in every dataset.

Standard Deviation

Standard Deviation

- Square root of variance
- Best measure of variation or dispersion
- Mathematically represented as σ

Standard Deviation - Limitations

- Hard to calculate
- Affected by extreme values
- Doesn’t reflect the full range of a data
- Can’t be used for comparison between two variables measured with different units

Coefficient of Variation

Coefficient of Variation

- Corrects for differences in dispersion between two variables of different units.
- Ratio of the standard deviation to the mean of a data set, expressed in percentage.

$$\mathrm{cv} = \frac{\sigma}{\mu} \cdot \%$$

$$\mathrm{cv} = \text{coefficient of variation}$$

$$\sigma = \text{standard deviation}$$

$$\mu = \text{mean}$$