

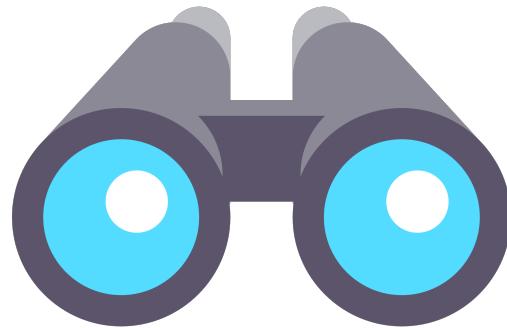


Statistics Foundation

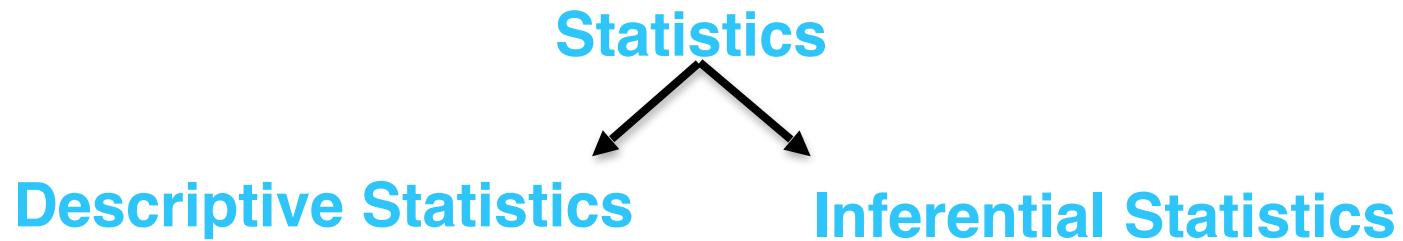
Descriptive Statistics

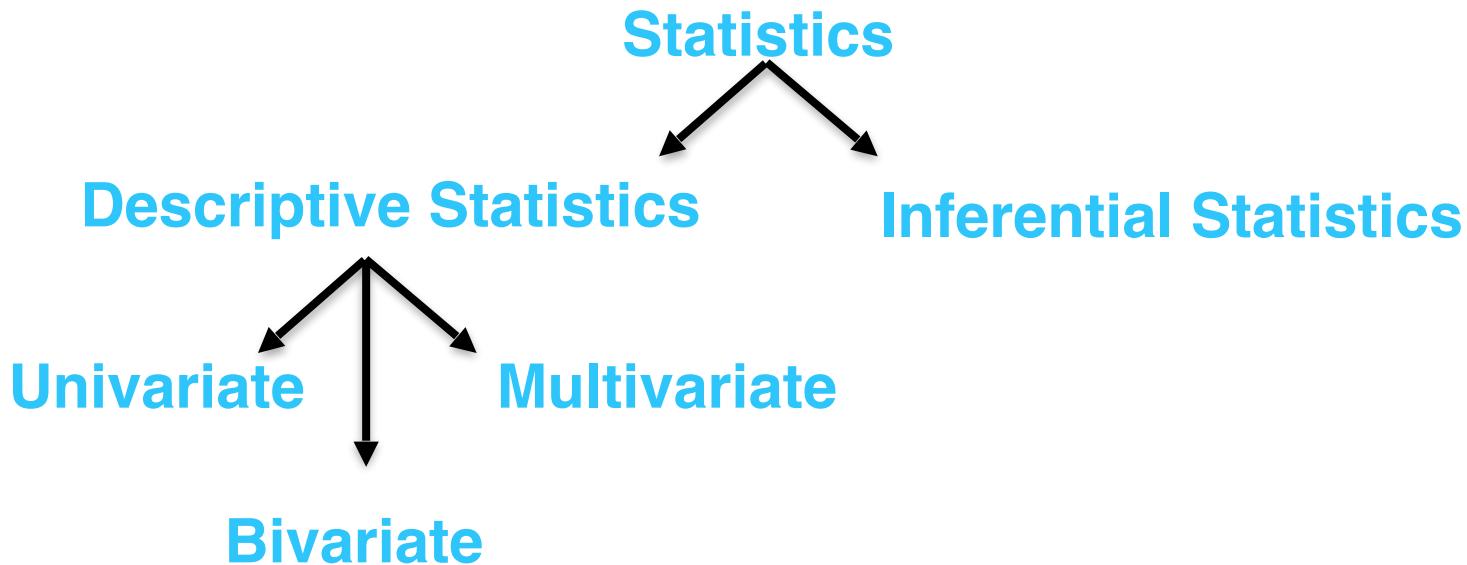


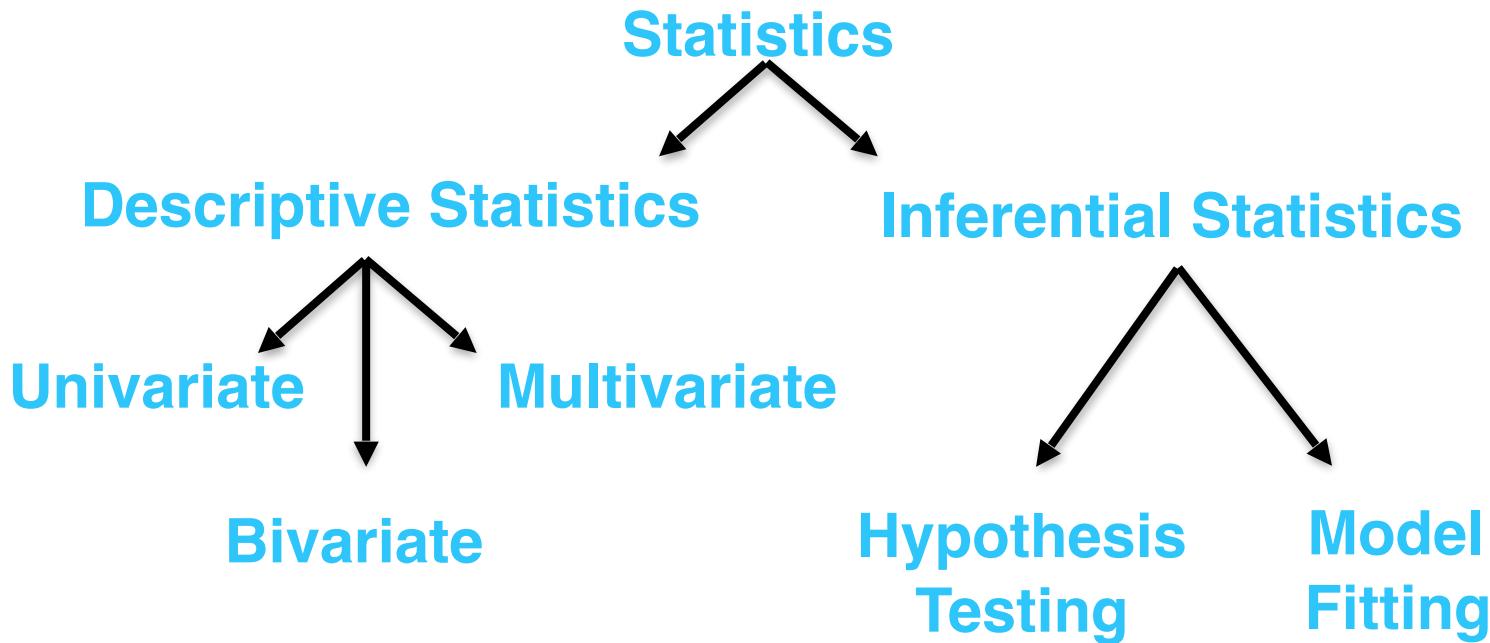
Descriptive Statistics

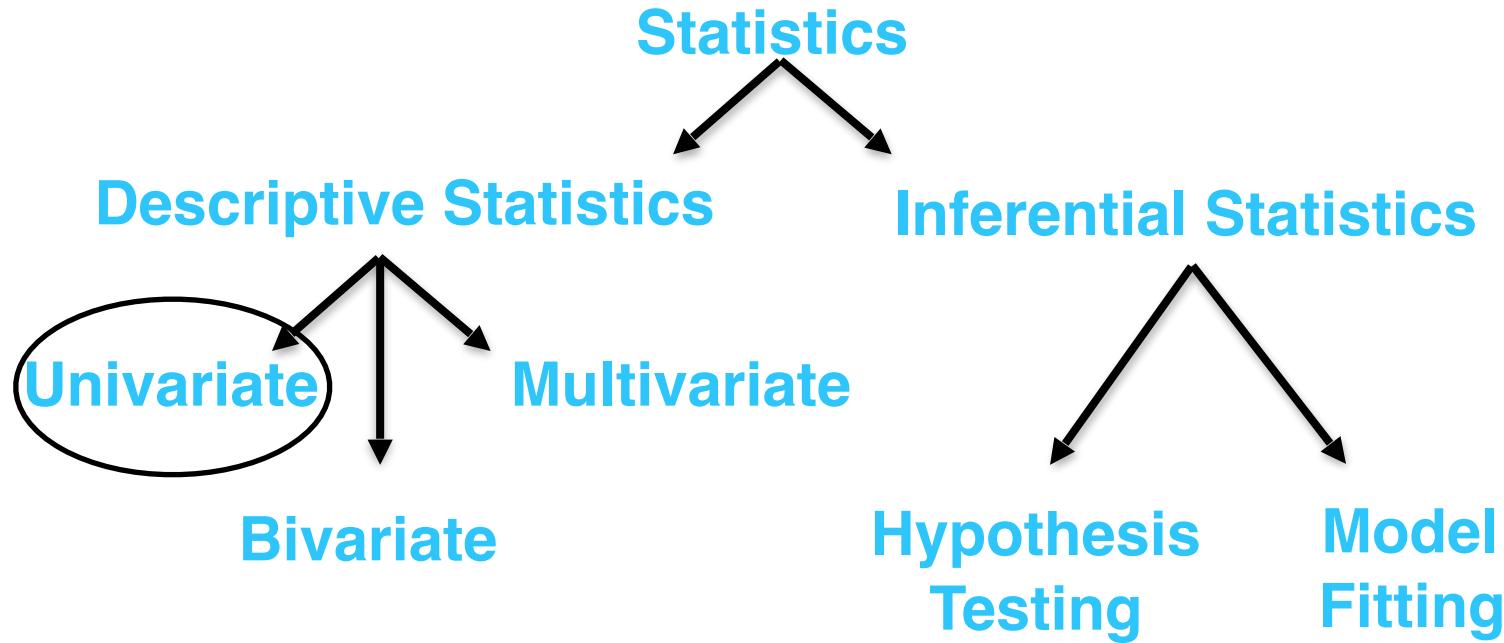


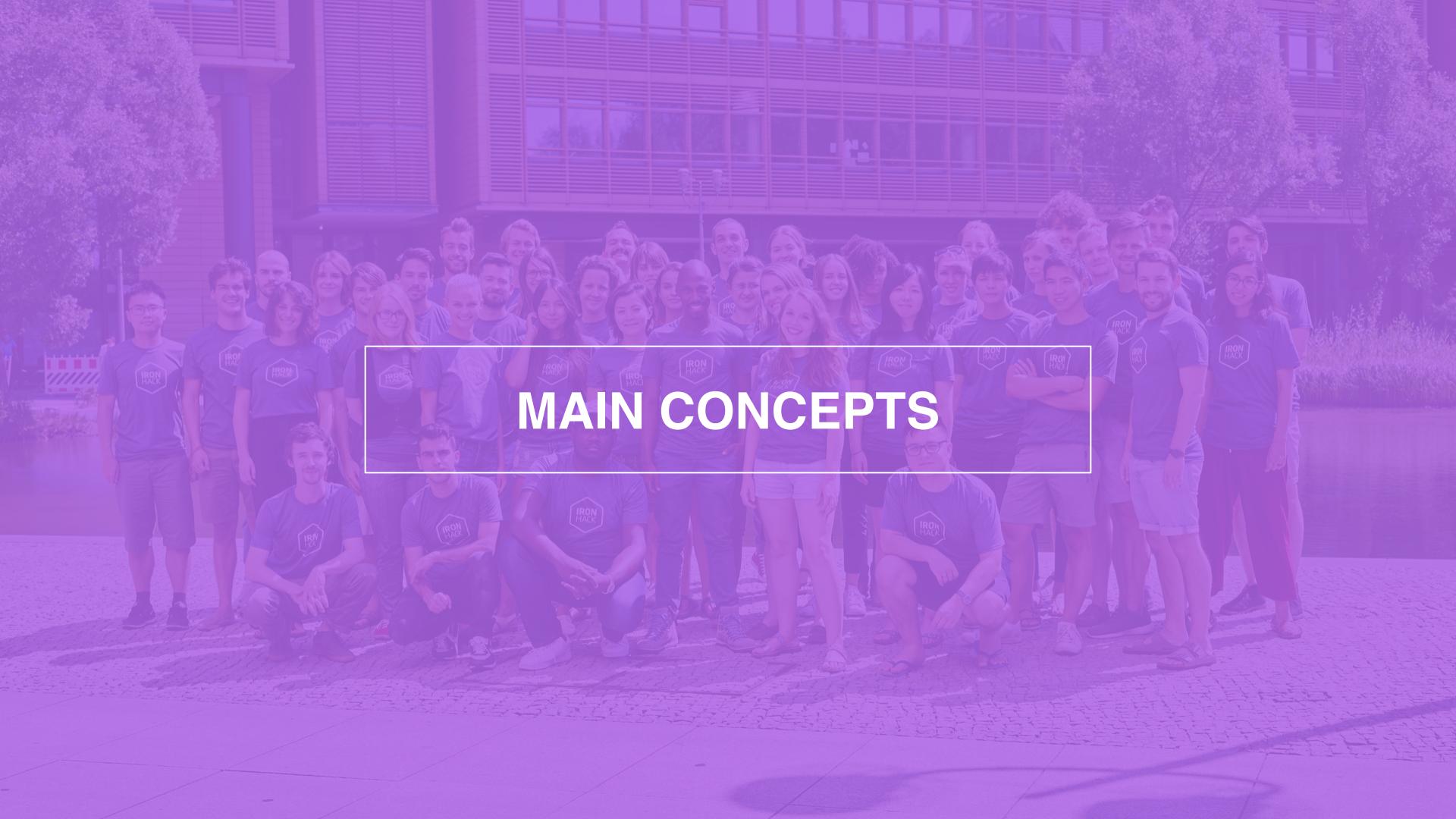
Inferential Statistics











MAIN CONCEPTS

Descriptive Statistics

- **Measures of Central Tendency:**

Which is the single best value to represent your data.

Mean, Median, Mode

Harmonic mean, geometric mean

Descriptive Statistics – Mean and Median



Descriptive Statistics – Mean and Median



$$\text{Mean} = \frac{10 + 31 + 17 + 21 + 25 + 17 + 12}{7}$$

$$\text{Mean} = 19$$



$$\text{Mean} = \frac{10 + 31 + 17 + 21 + 25 + 17 + 12 + 1000}{8}$$

$$\text{Mean} = 141,625$$



$$\text{Median} = 17$$



$$\text{Median} = \frac{17 + 21}{2} = 19$$

Descriptive Statistics – Mean and Median



$$\text{Mean} = \frac{10 + 31 + 17 + 21 + 25 + 17 + 12}{7}$$

$$\text{Mean} = 19$$



$$\text{Mean} = \frac{10 + 31 + 17 + 21 + 25 + 17 + 12 + 1000}{8}$$

$$\text{Arithmetic Mean} = 141,625$$



$$\text{Median} = 17$$



$$\text{Median} = \frac{17 + 21}{2} = 19$$

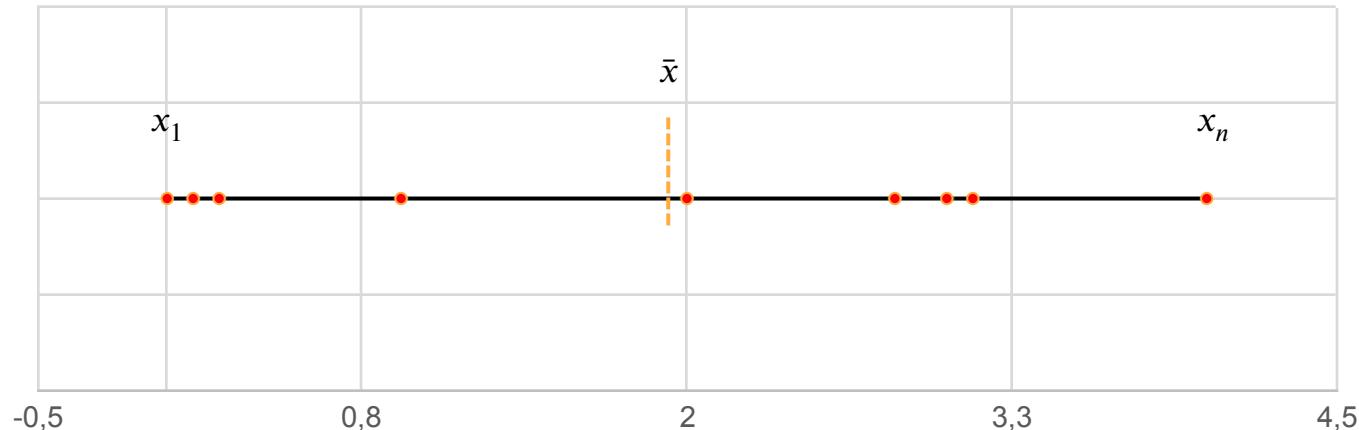
Descriptive Statistics

- **Measures of Dispersion:**

How does the data vary? How do they jump around?

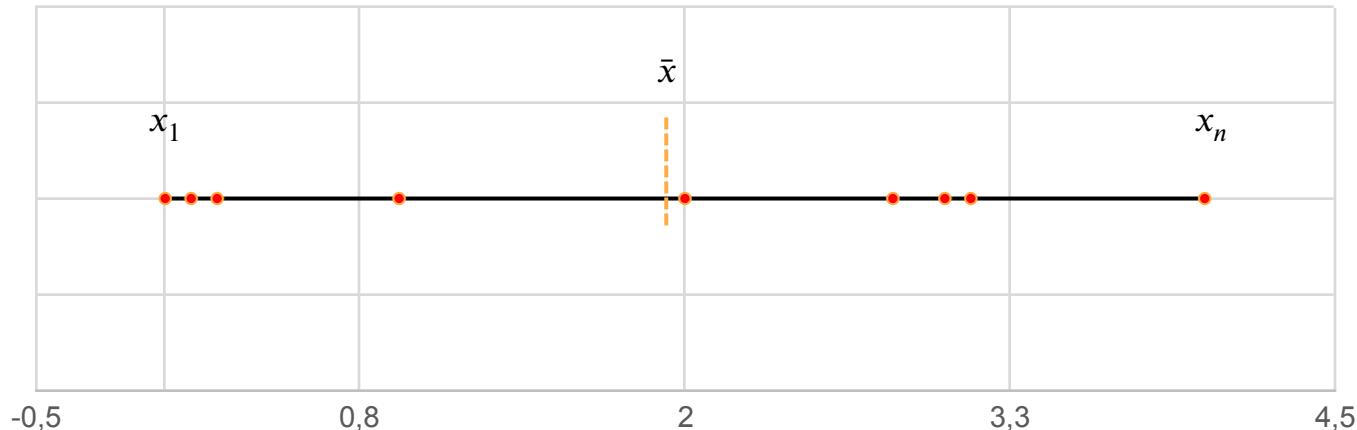
Variance, Standard Deviation, Range, InterQuartile Range

Descriptive Statistics

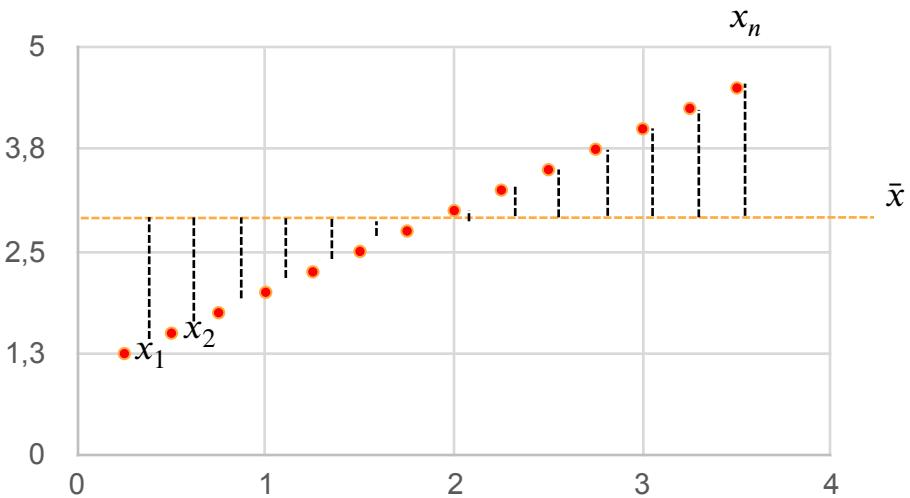


Descriptive Statistics

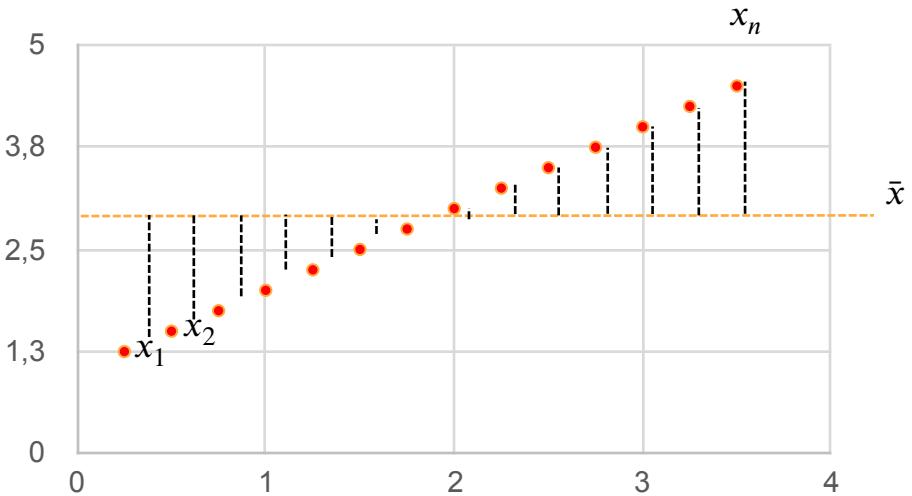
$$\text{Range} = \mathbf{X}_{\max} - \mathbf{X}_{\min}$$



Descriptive Statistics



Descriptive Statistics



Mean Deviation = $(x_i - \bar{x})$

Squared Mean Deviation = $(x_i - \bar{x})^2$

Variance = $\frac{\sum (x_i - \bar{x})^2}{n}$

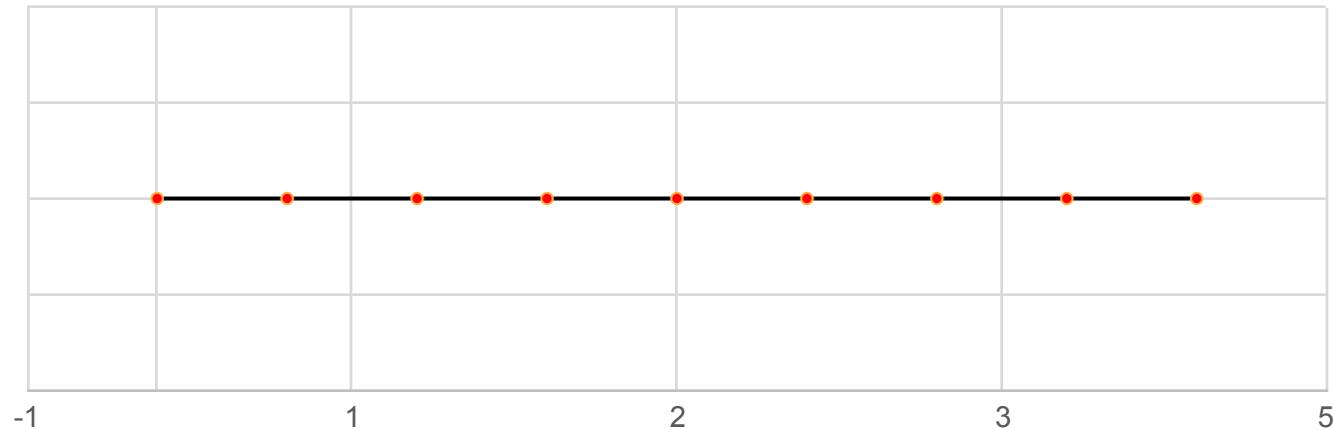
Variance = $\frac{\sum (x_i - \bar{x})^2}{n - 1}$

Descriptive Statistics

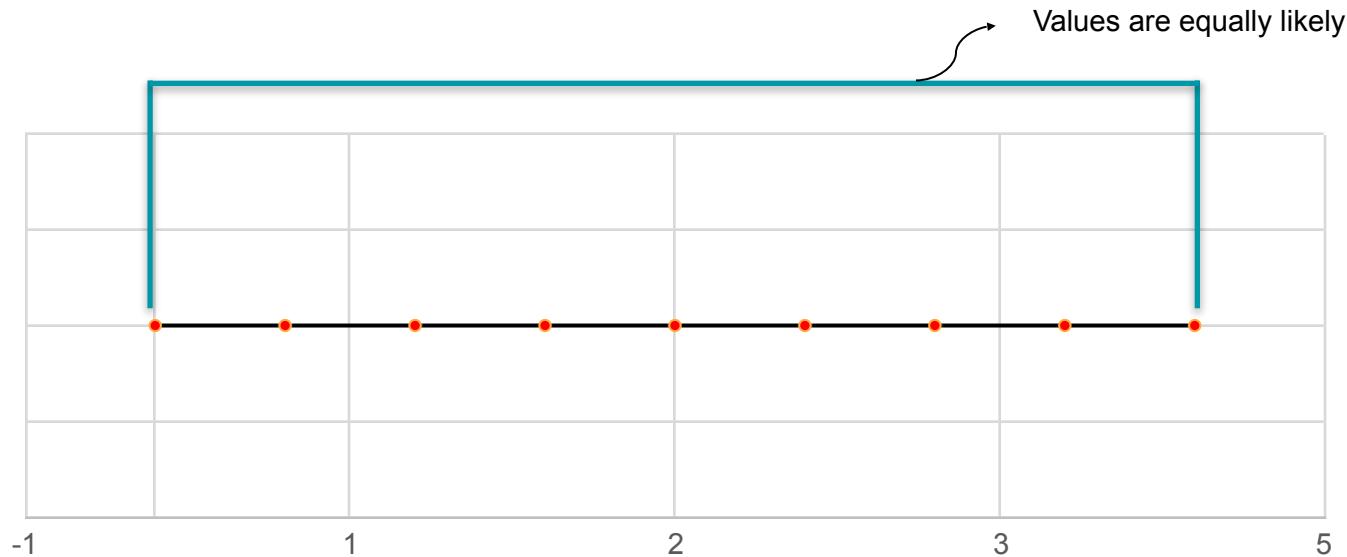
- **Gaussian Normal Distribution:**

Distribution is a formula that tells you how likely a particular value is to occur in your data.

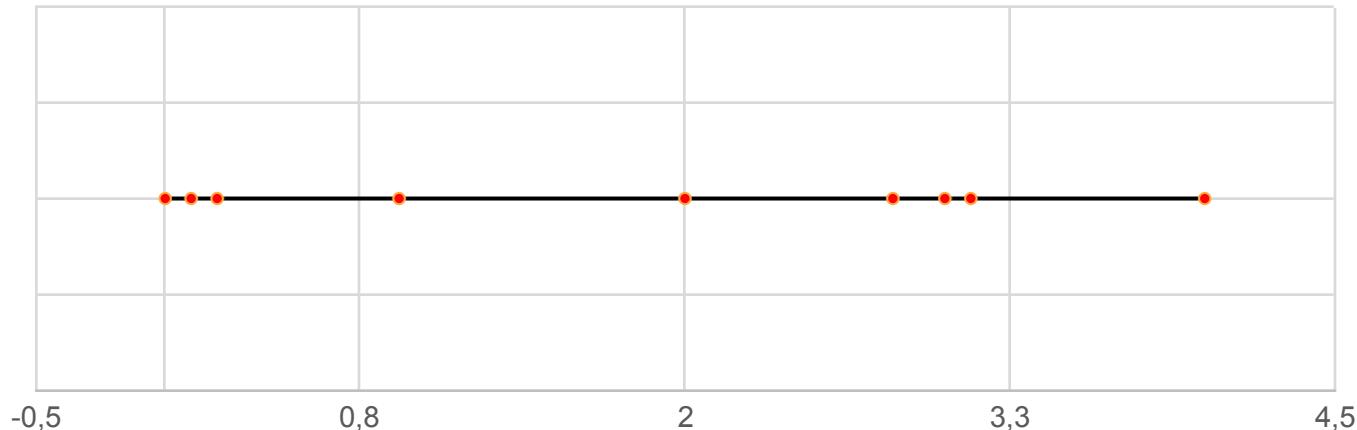
Descriptive Statistics



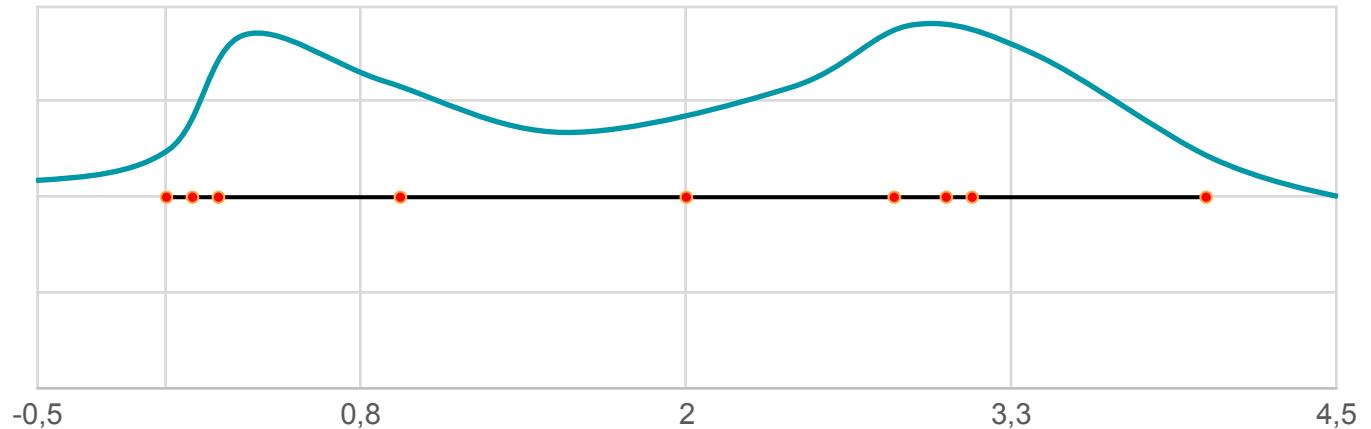
Descriptive Statistics



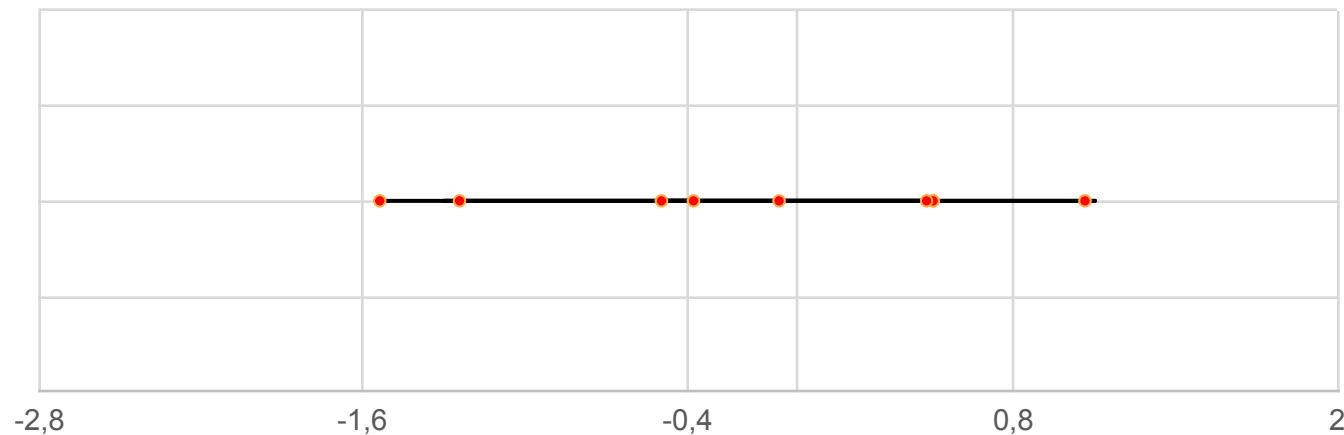
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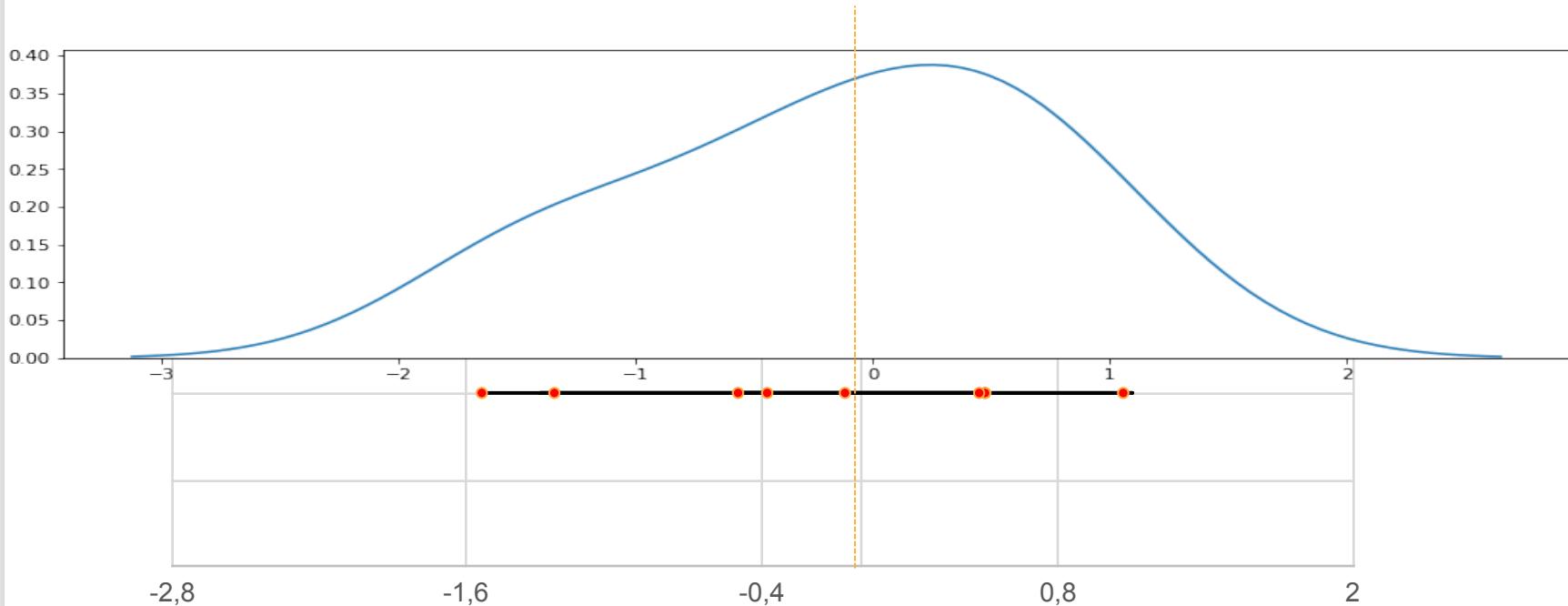
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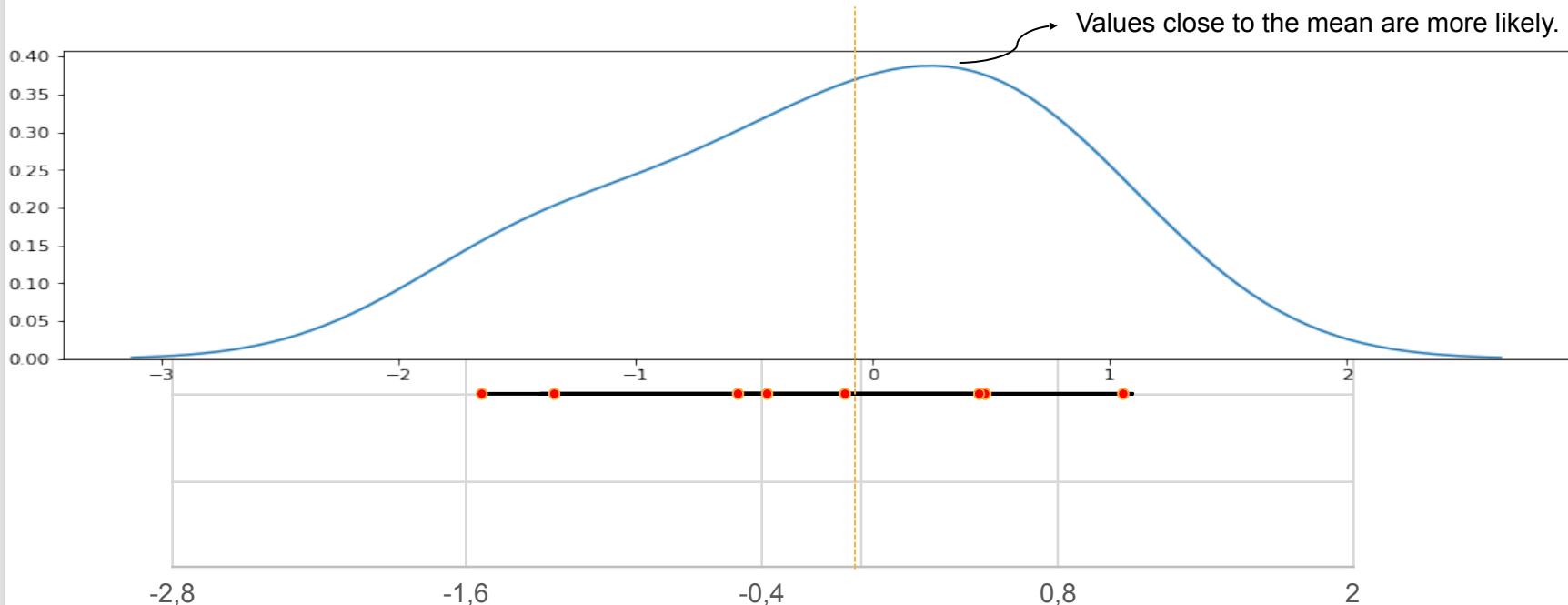
Descriptive Statistics



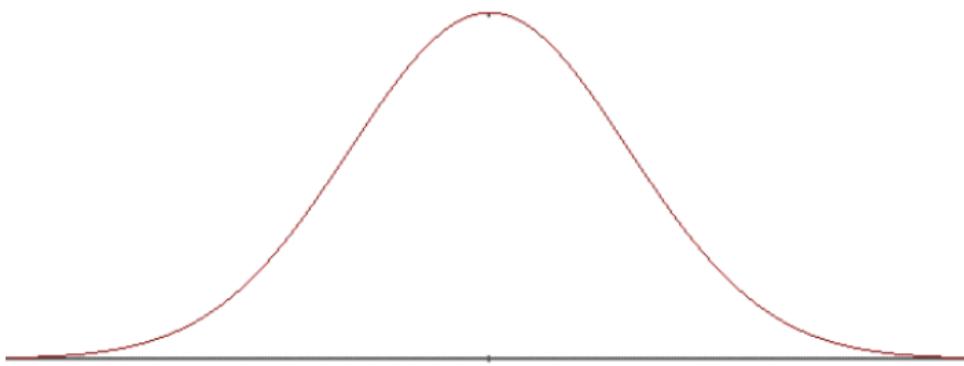
Descriptive Statistics - <https://galtonboard.com/probabilityexamplesinlife>



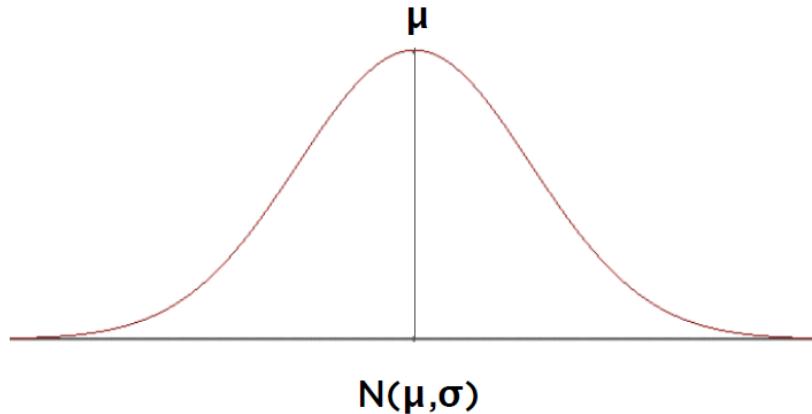
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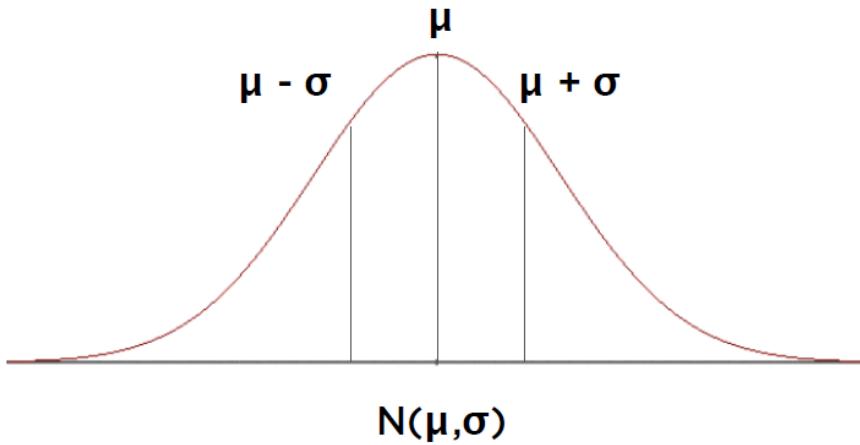
Descriptive Statistics - Gaussian Distribution



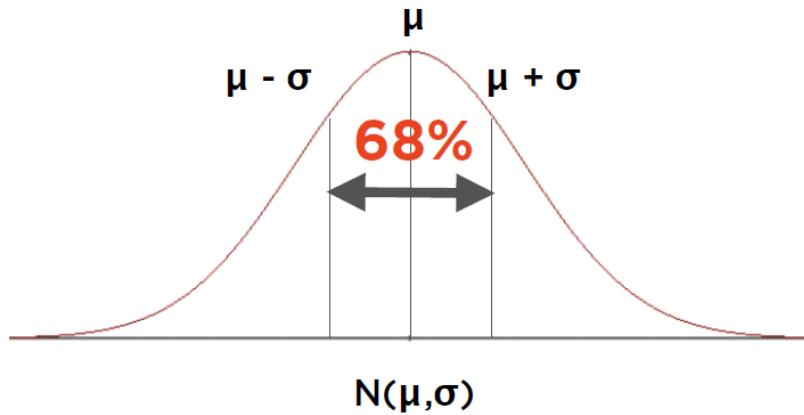
Descriptive Statistics - Gaussian Distribution



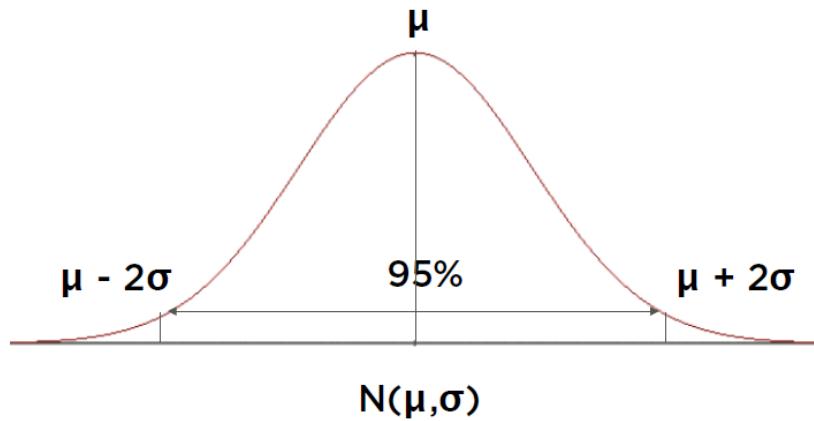
Descriptive Statistics - Gaussian Distribution



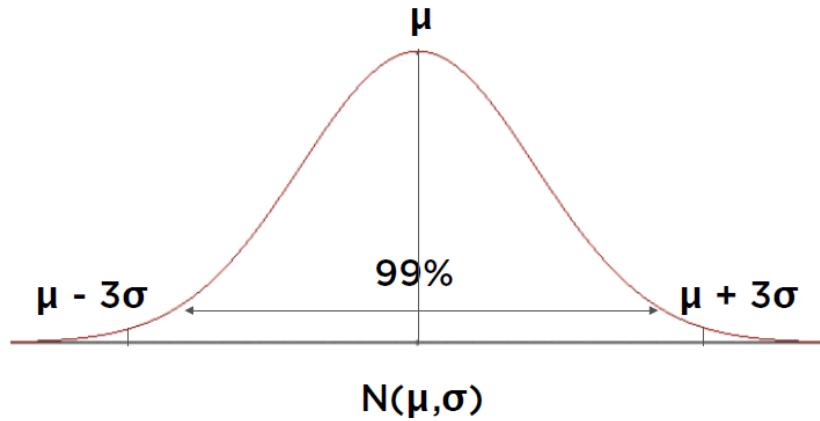
Descriptive Statistics - Gaussian Distribution



Descriptive Statistics - Gaussian Distribution



Descriptive Statistics - Gaussian Distribution

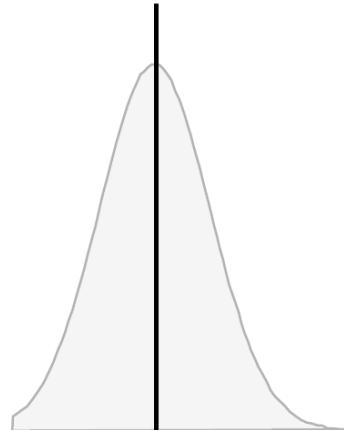


Descriptive Statistics - Gaussian Distribution

Effect of σ

Low σ :

Values closer to the mean



High σ :

Values far away from the mean



Descriptive Statistics - Gaussian Distribution

