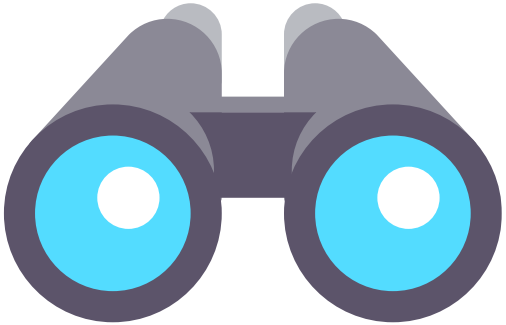
Statistics Foundation

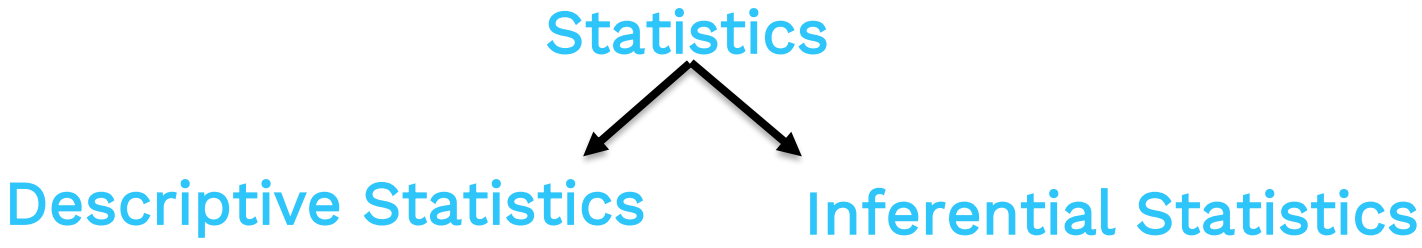
Descriptive Statistics

JANUARY, 07 2020 | SAO PAULO

Descriptive Statistics



Inferential Statistics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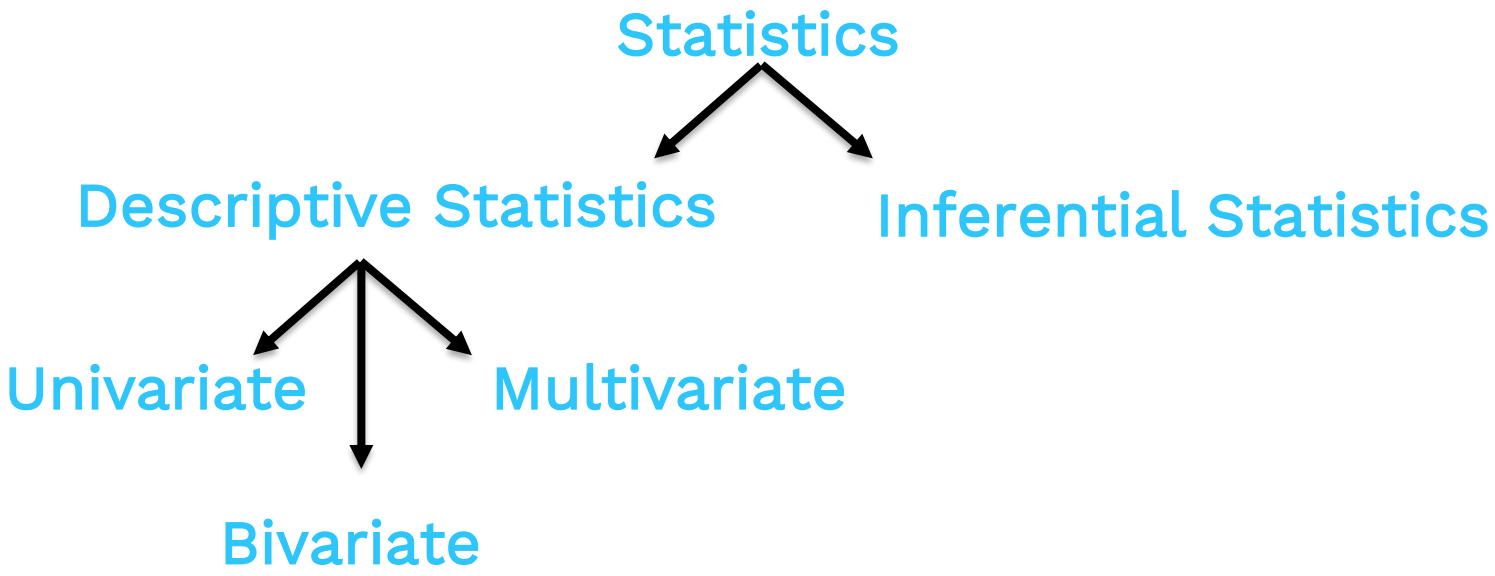
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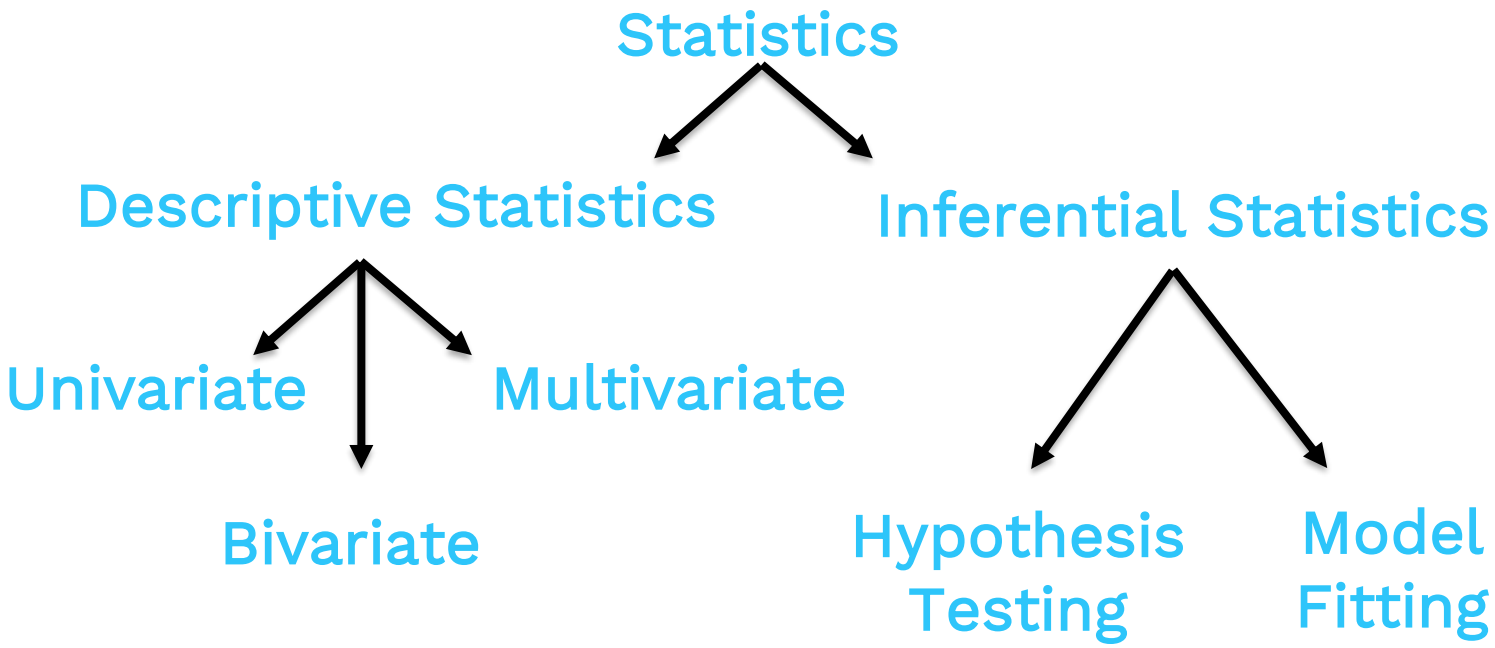
Univariate
Multivariate
Bivariate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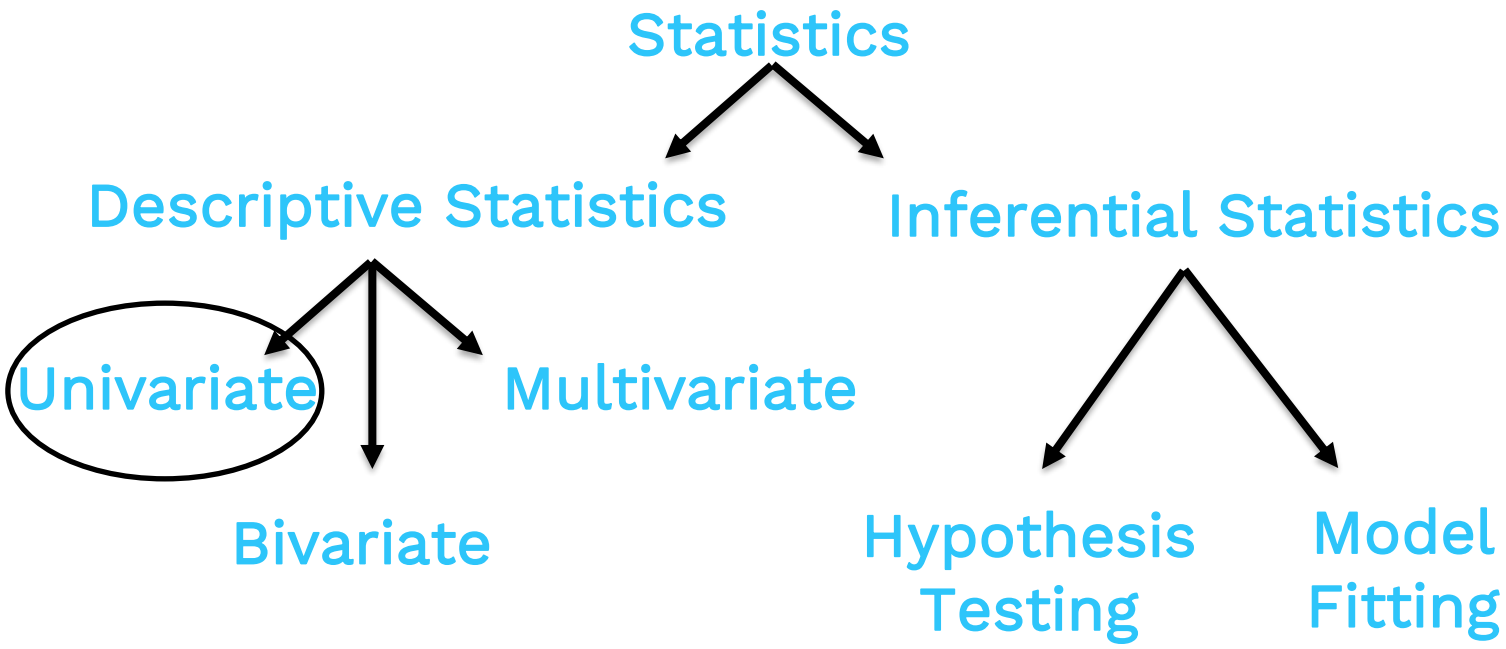
Hypothesis Testing
Model Fitting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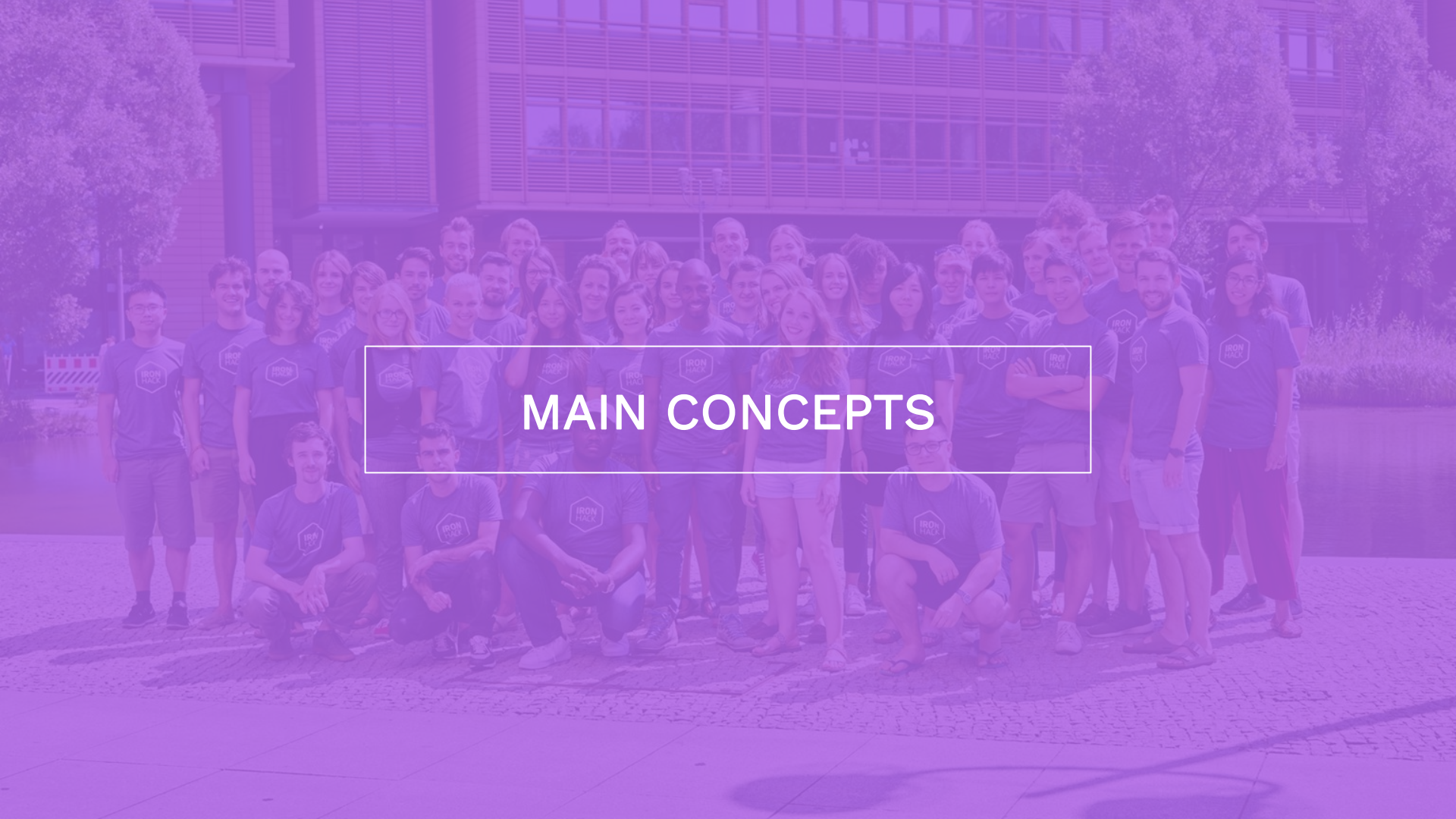


MAIN CONCEPTS

Descriptive Statistics

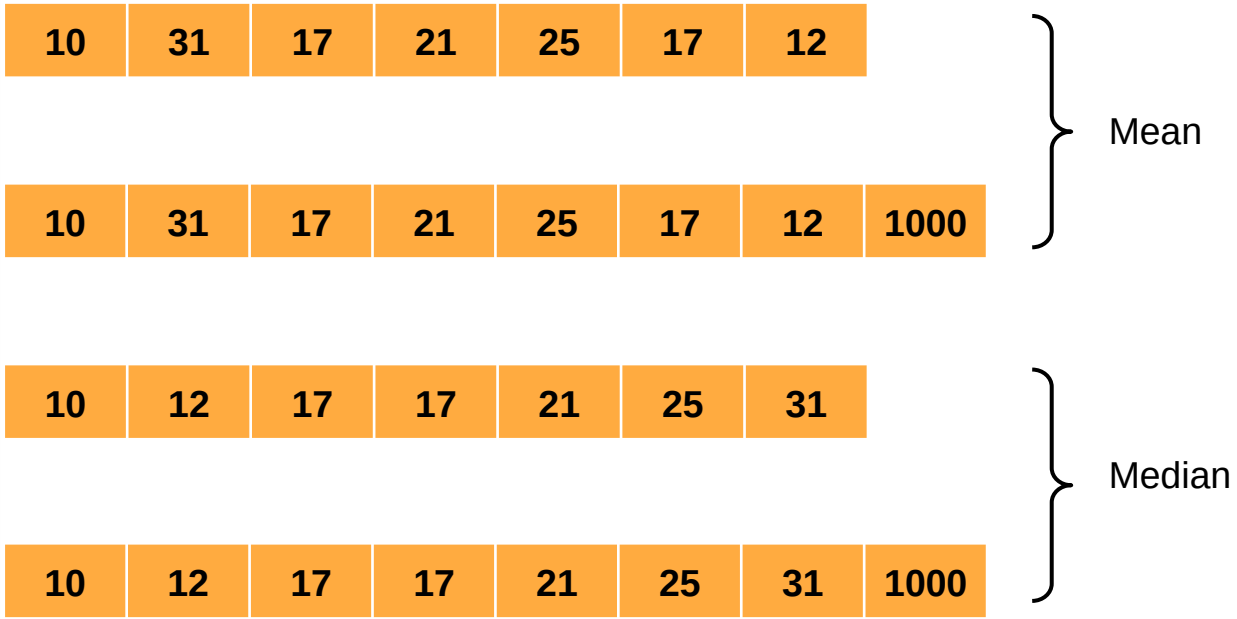
- Measures of Central Tendency:

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

10	31	17	21	25	17	12

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

$$Mean = 19$$

10	31	17	21	25	17	12	1000

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

$$Mean = 141{,}625$$

10	12	17	17	21	25	31

$$Median = 17$$

10	12	17	17	21	25	31	1000

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

Descriptive Statistics – Mean and Median

10	31	17	21	25	17	12

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

$$Mean = 19$$

10	31	17	21	25	17	12	1000

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

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

10	12	17	17	21	25	31

$$Median = 17$$

10	12	17	17	21	25	31	1000

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

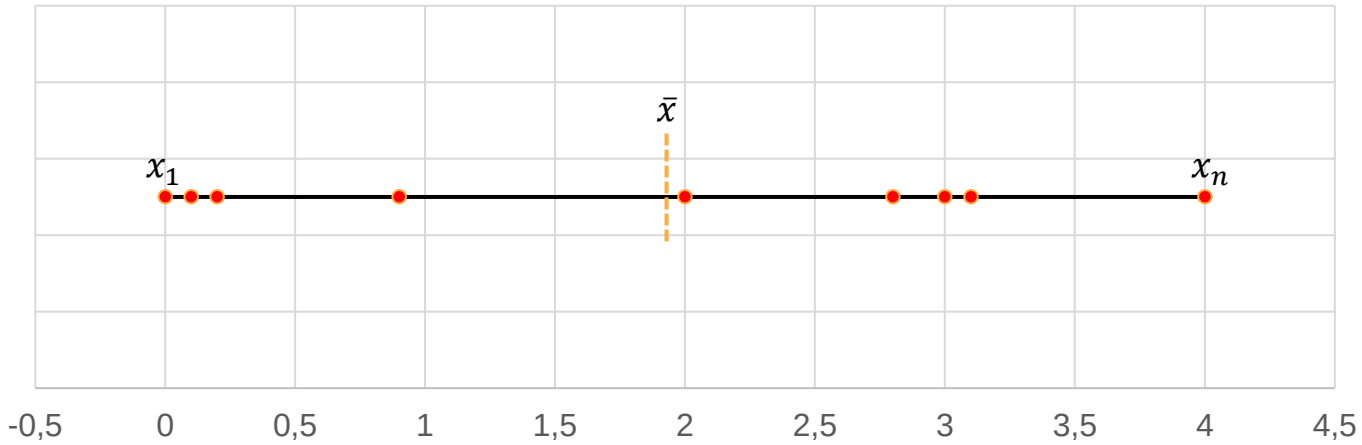
Descriptive Statistics

- **Measures of Dispersion:**

How the data varies? How do they jump around?

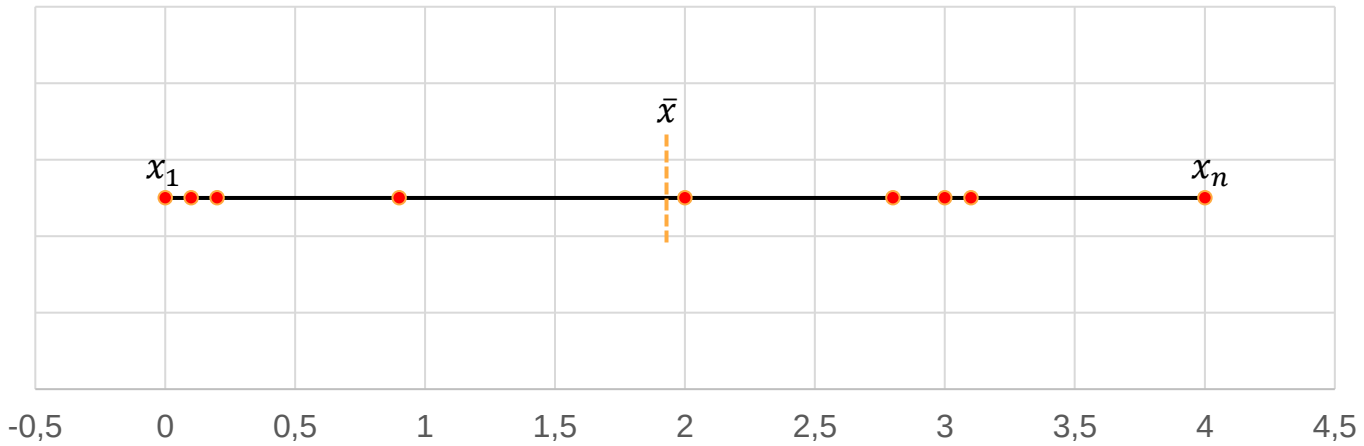
Variance, Standard Deviation, Range, InterQuartile Range

Descriptive Statistics



Descriptive Statistics

Range = **X**max - **X**min



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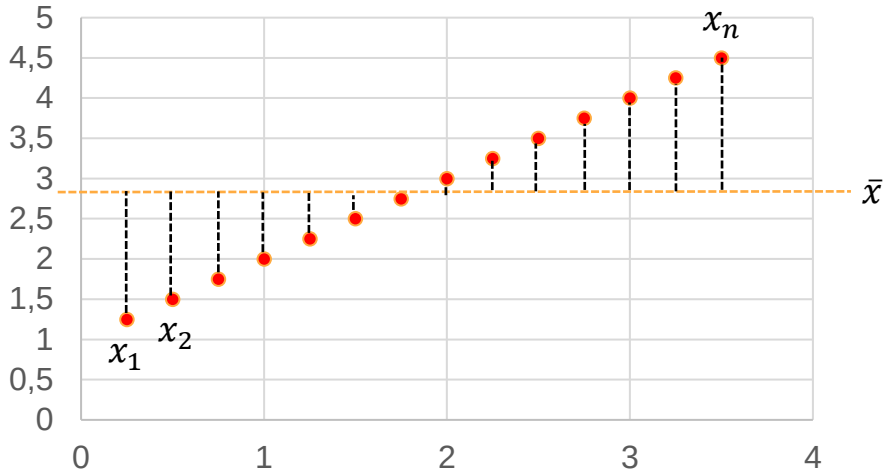

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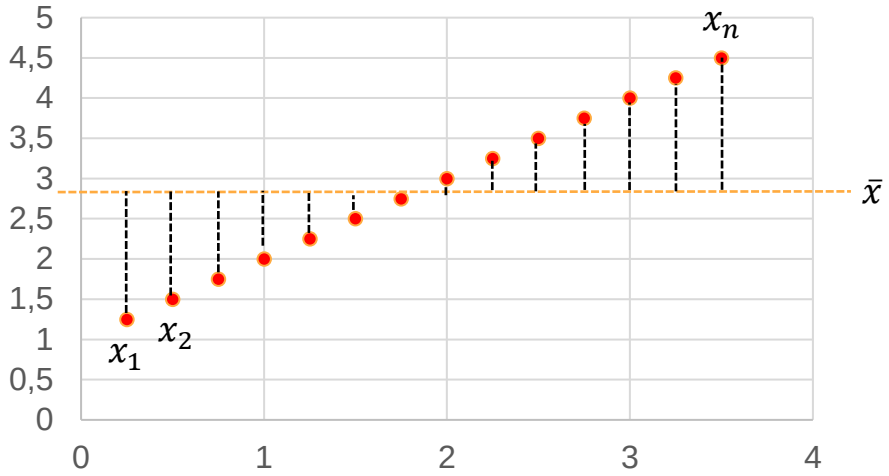


Mean Deviation = $(x_i - \bar{x})$

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

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

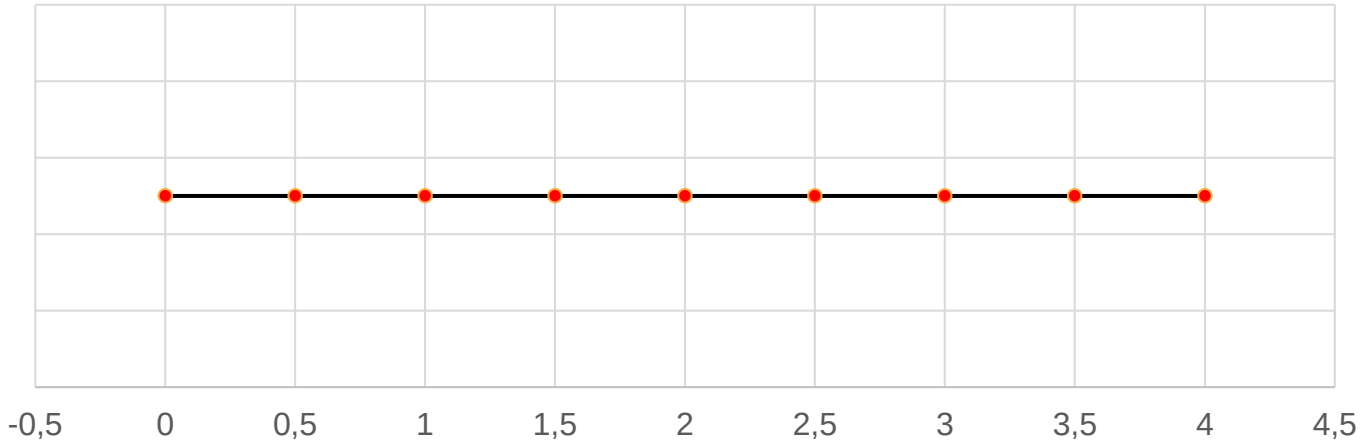
Variance = $\frac{\sum(x_i - \bar{x})^2}{n-1}$

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



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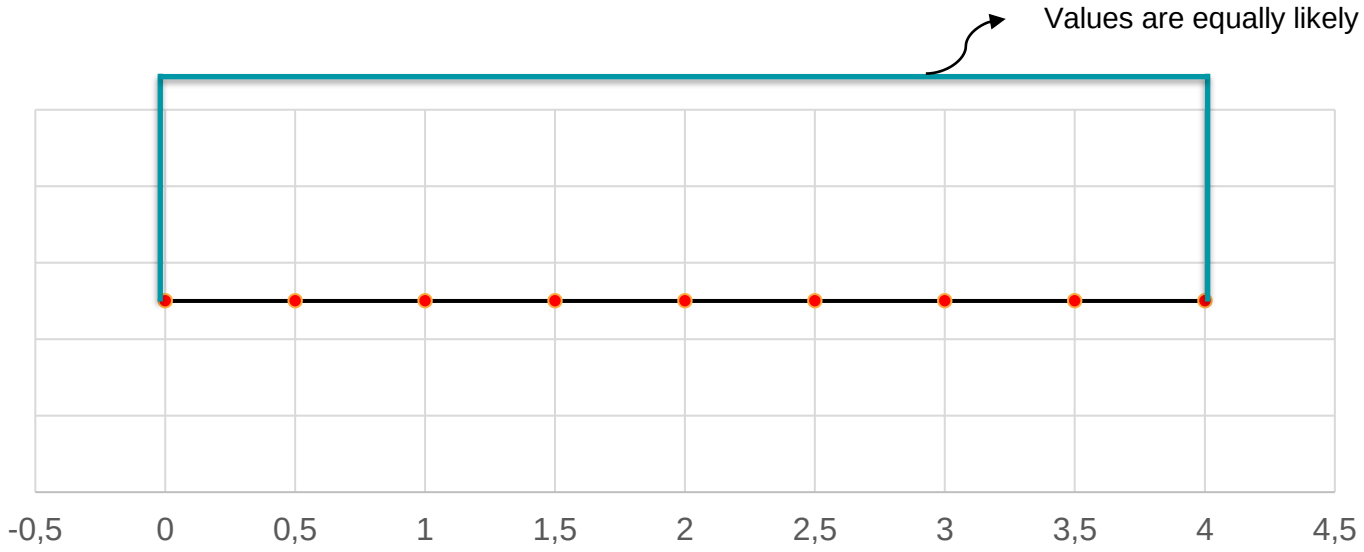

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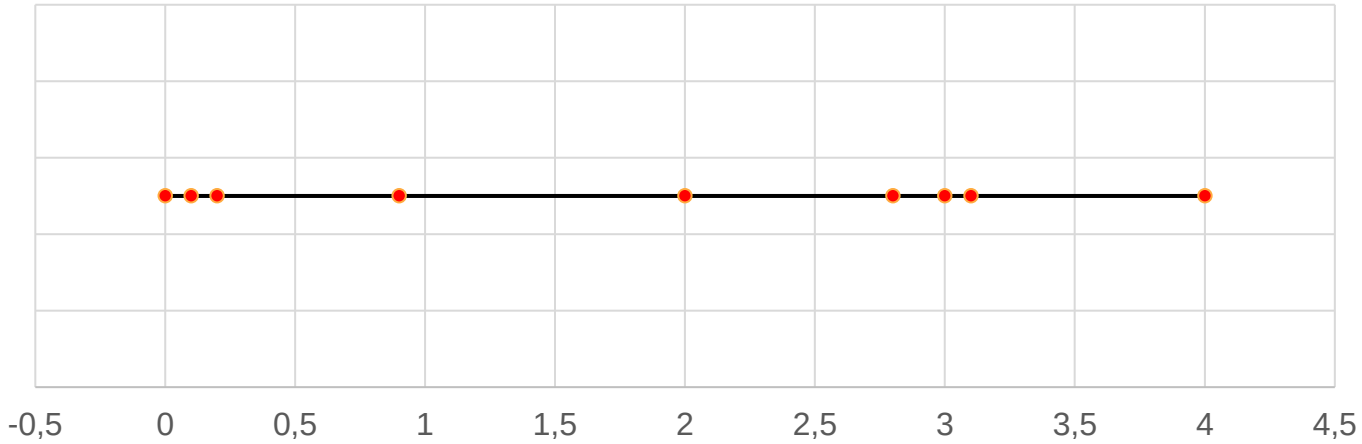

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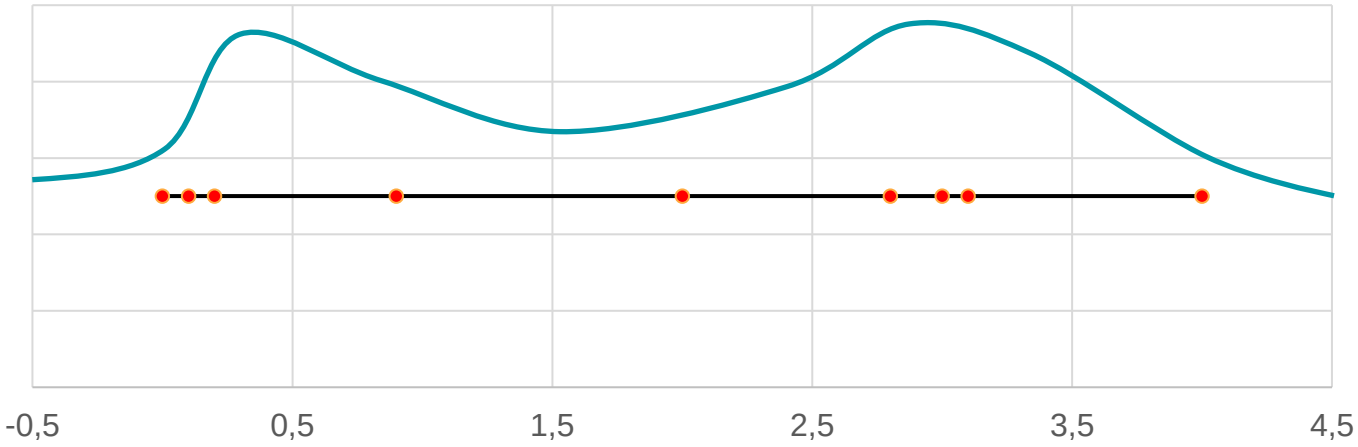

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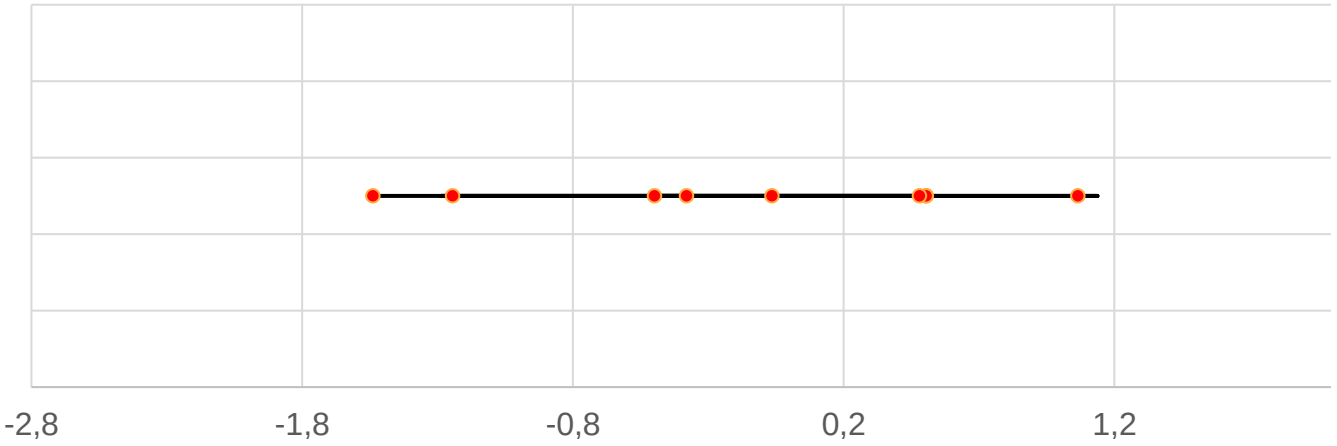
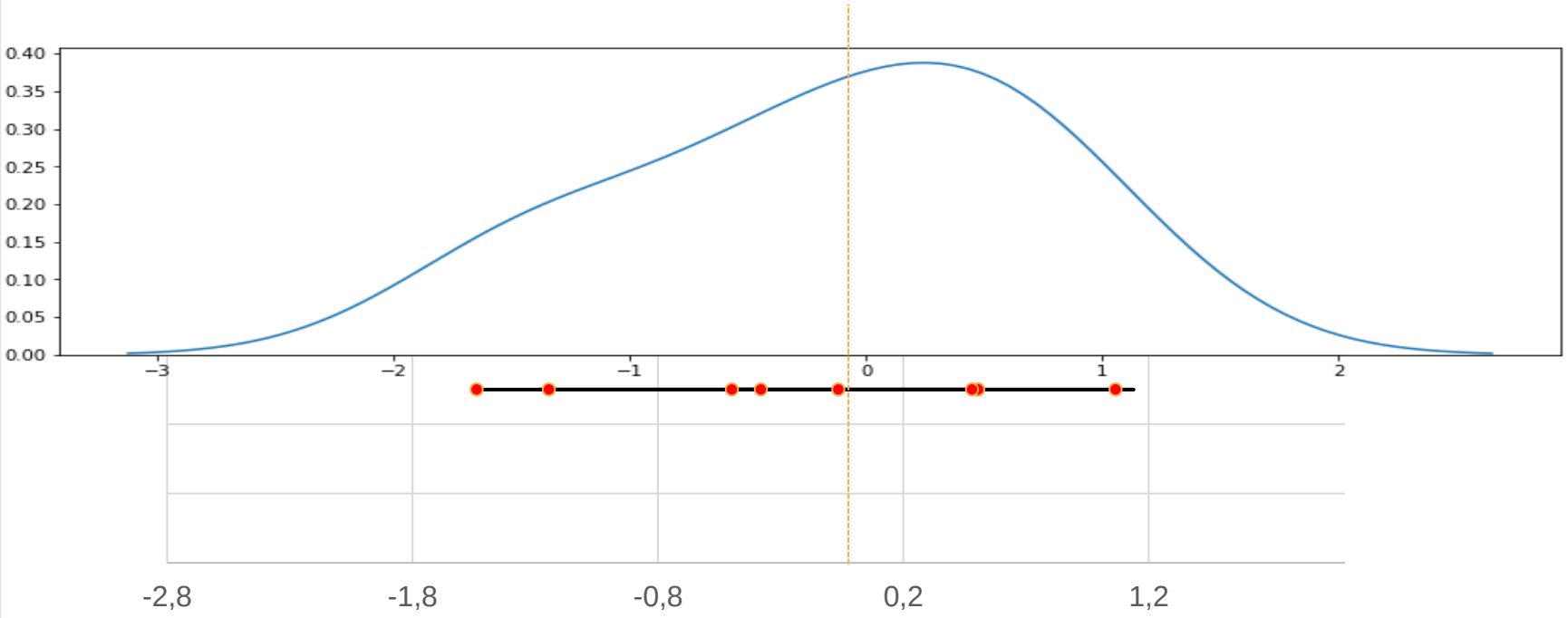


Descriptive Statistics - https://galtonboard.com/probabilityexamplesinlife



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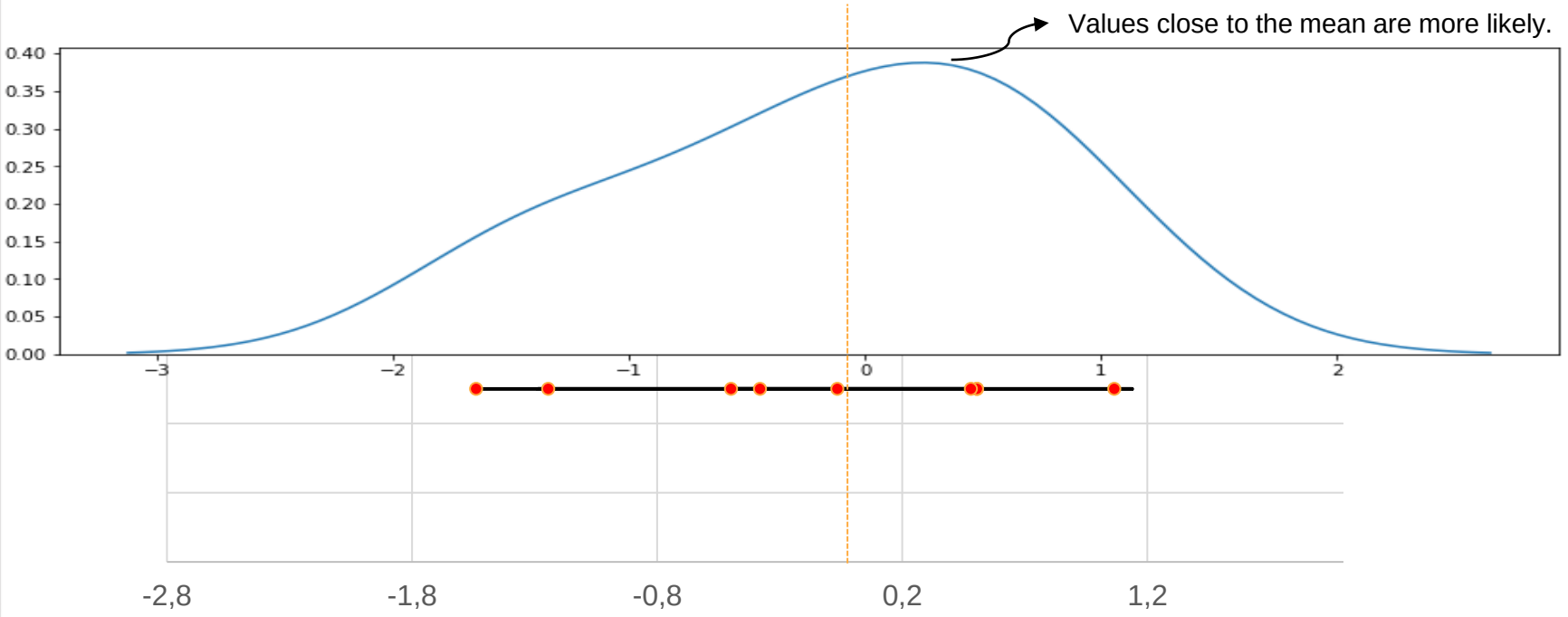

Descriptive Statistics - Gaussian Distribution

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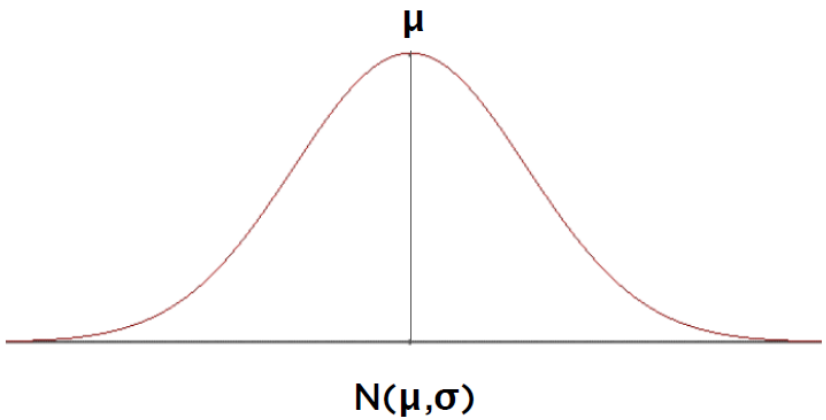

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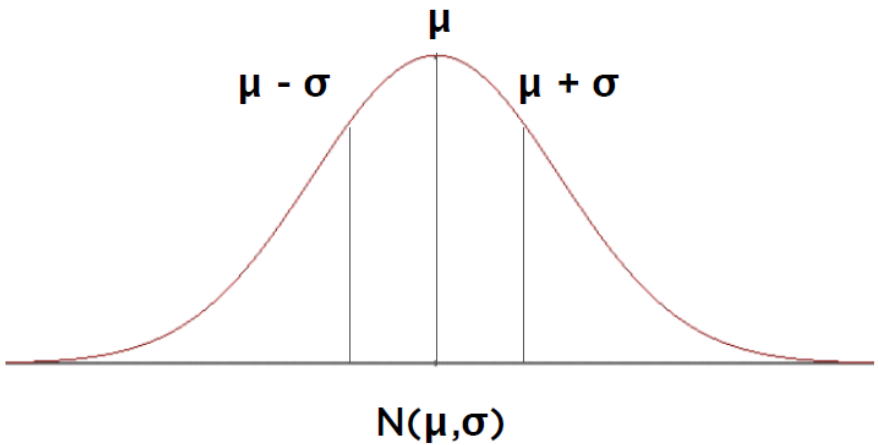

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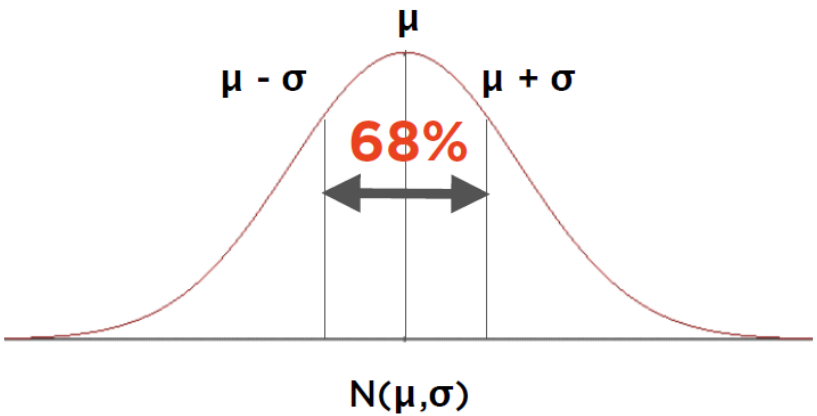

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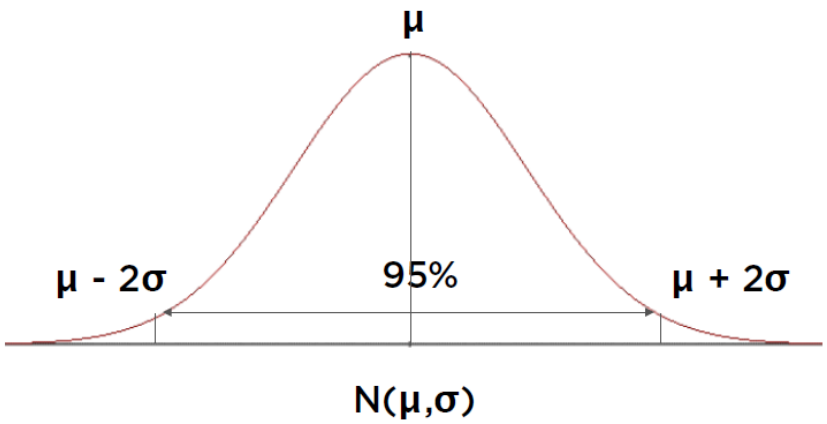

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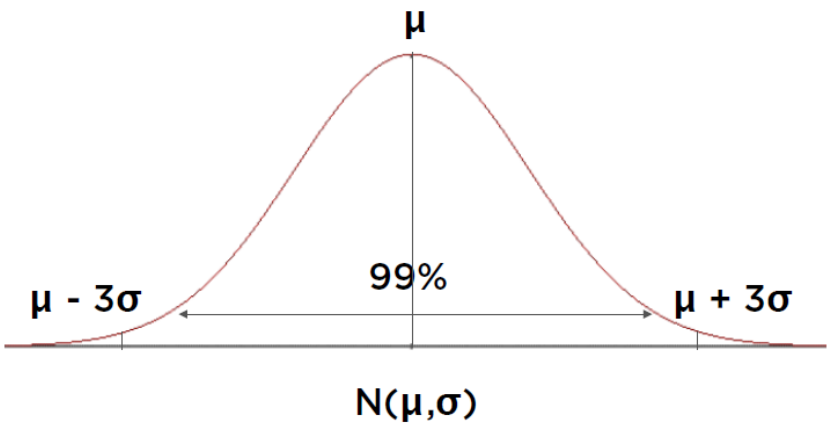
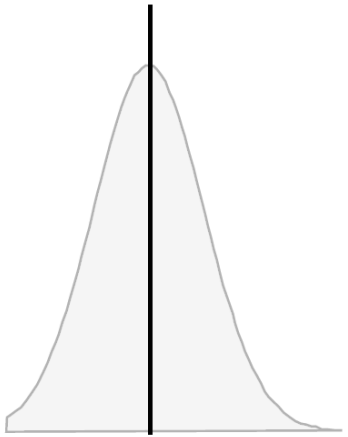


Descriptive Statistics - Gaussian Distribution

Effect of σ

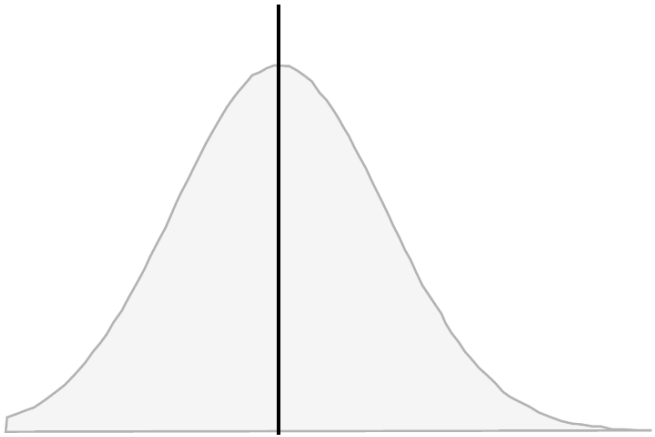
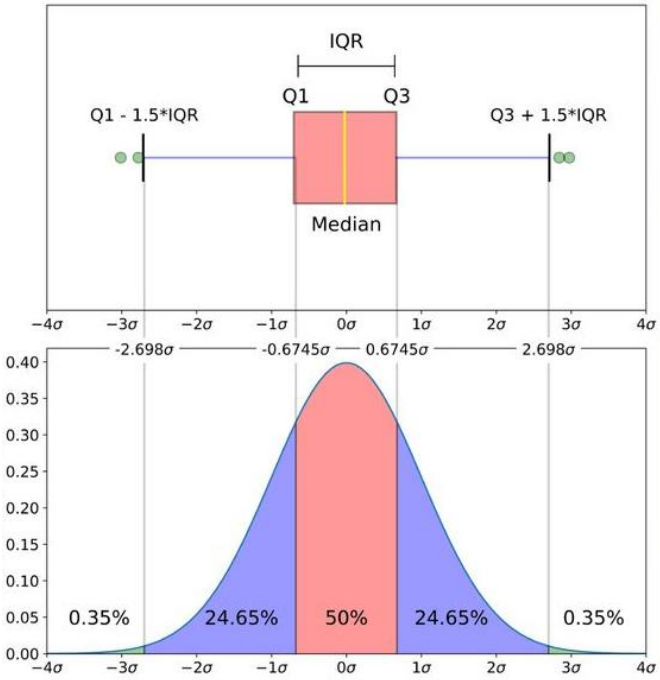
Low σ:

Values closer to the mean



High σ:

Values far away from the mean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