The Mean: Takeaways

Syntax

Computing the mean of any numerical array:

- Pure Python:

```
mean = sum(array) / len(array)
```

- Using numpy:

```
from numpy import mean


mean_numpy = mean(array)
```

Computing the mean of a `Series`:

```
mean = Series.mean()
```

Concepts

- We can summarize the distribution of a numerical variable by computing its **mean**.
- The mean is a single value and is the result of taking into account **equally** each value in the distribution.
- The mean is **the balance point** of a distribution — the total distance of the values below the mean is equal to the total distance of the values above the mean.
- The mean μ of a population can be defined algebraically in several equivalent ways:

$$\mu = \frac{x_1+x_2+\ldots+x_N}{N} = \frac{\sum_{i=1}^{N} x_i}{N} = \frac{1}{N}\left(\sum_{i=1}^{N} x_i\right)$$

- The mean $\bar{x}$ of a sample can be defined algebraically in several equivalent ways:

$$\bar{x} = \frac{x_1+x_2+\ldots+x_n}{n} = \frac{\sum_{i=1}^{n} x_i}{n} = \frac{1}{n}\left(\sum_{i=1}^{n} x_i\right)$$

- The sample mean $\bar{x}$ is an unbiased estimator for the population mean μ.

Resources

- The Wikipedia entry on the mean.
- Useful documentation:
    - numpy.mean()
    - Series.mean()