

CSD 598 - Winter 2026

Descriptive statistics and data visualisation

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3 Feb 2026

Last time: Ethics

Any questions? Any thoughts?

Why do data exploration?

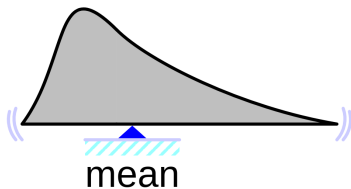
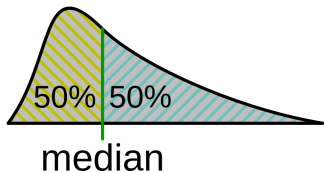
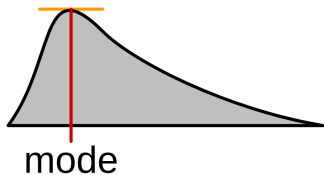


"Remember kids, the only difference between screwing around and science is writing it down."

Adam Savage, quoting ballistics expert Alex Jason

Descriptive stats

Central tendencies



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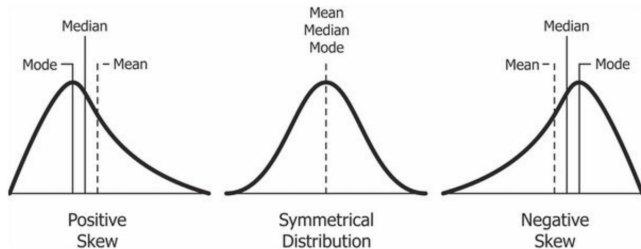
Dispersion and shape

Dispersion

- ▶ Range, quartiles: easy to calculate on samples
- ▶ Standard deviation (SD), variance: most used
- ▶ Average absolute deviation: more robust than SD

Shape measures

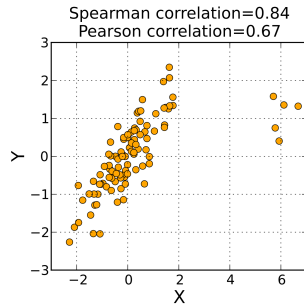
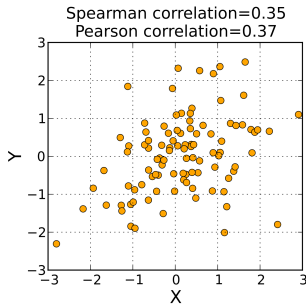
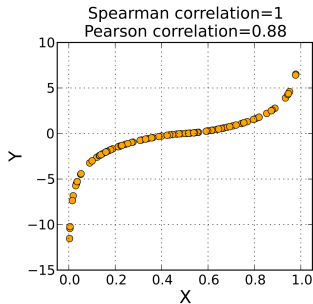
- ▶ Skewness: which way does the distribution lean?
- ▶ Kurtosis: tailedness, things get complex here



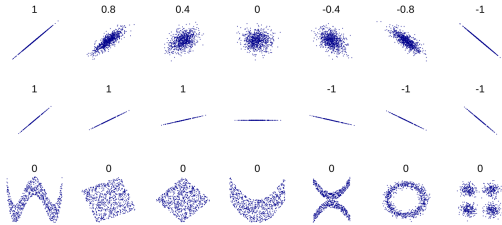
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Dependence between variables: The usual

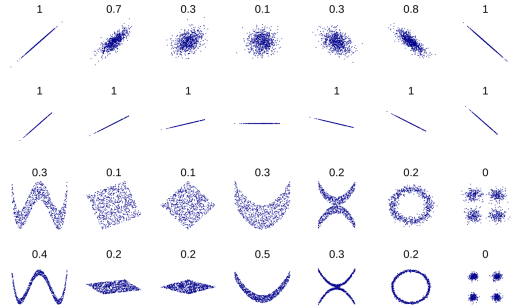
- Covariance: measure of the linear relationship between two variables.
- Pearson's ρ : correlation of continuous variables
- Spearman's ρ : correlation of ordering of variables



Dependence between variables: Pearson vs Distance correlation



Pearson correlation



Distance correlation

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Visualisation



Dr. Lindsay Portnoy
@lportnoy

This is not how pie charts work



9:48 PM · Mar 26, 2020 · [Twitter for iPhone](#)

8.1K Retweets 49.8K Likes

Choosing a good graph

Tell-show-do-apply

References