Descriptive statistics

PREPARING FOR STATISTICS INTERVIEW QUESTIONS IN PYTHON

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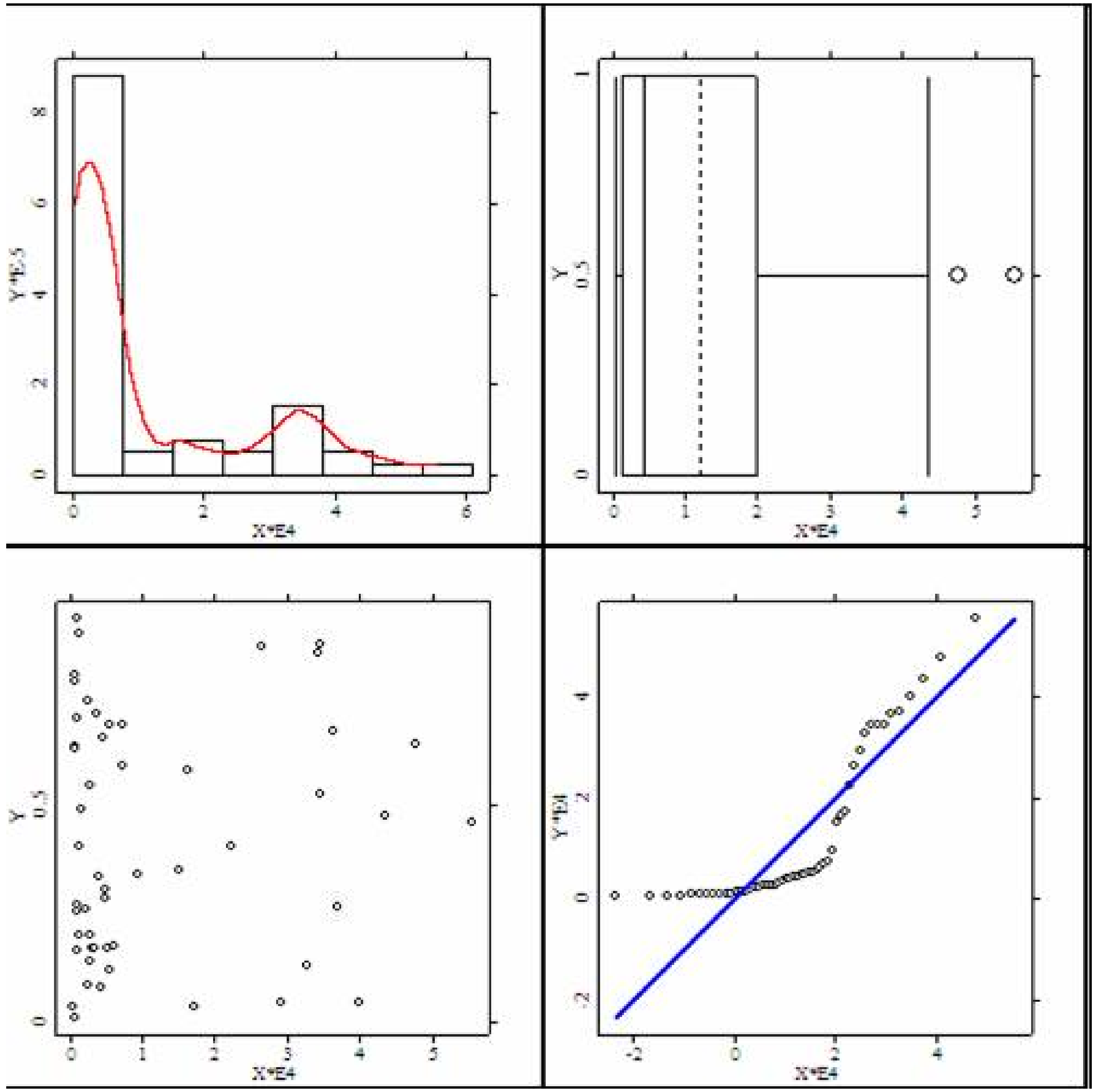
Data Scientist, Squarespace

What are descriptive statistics?

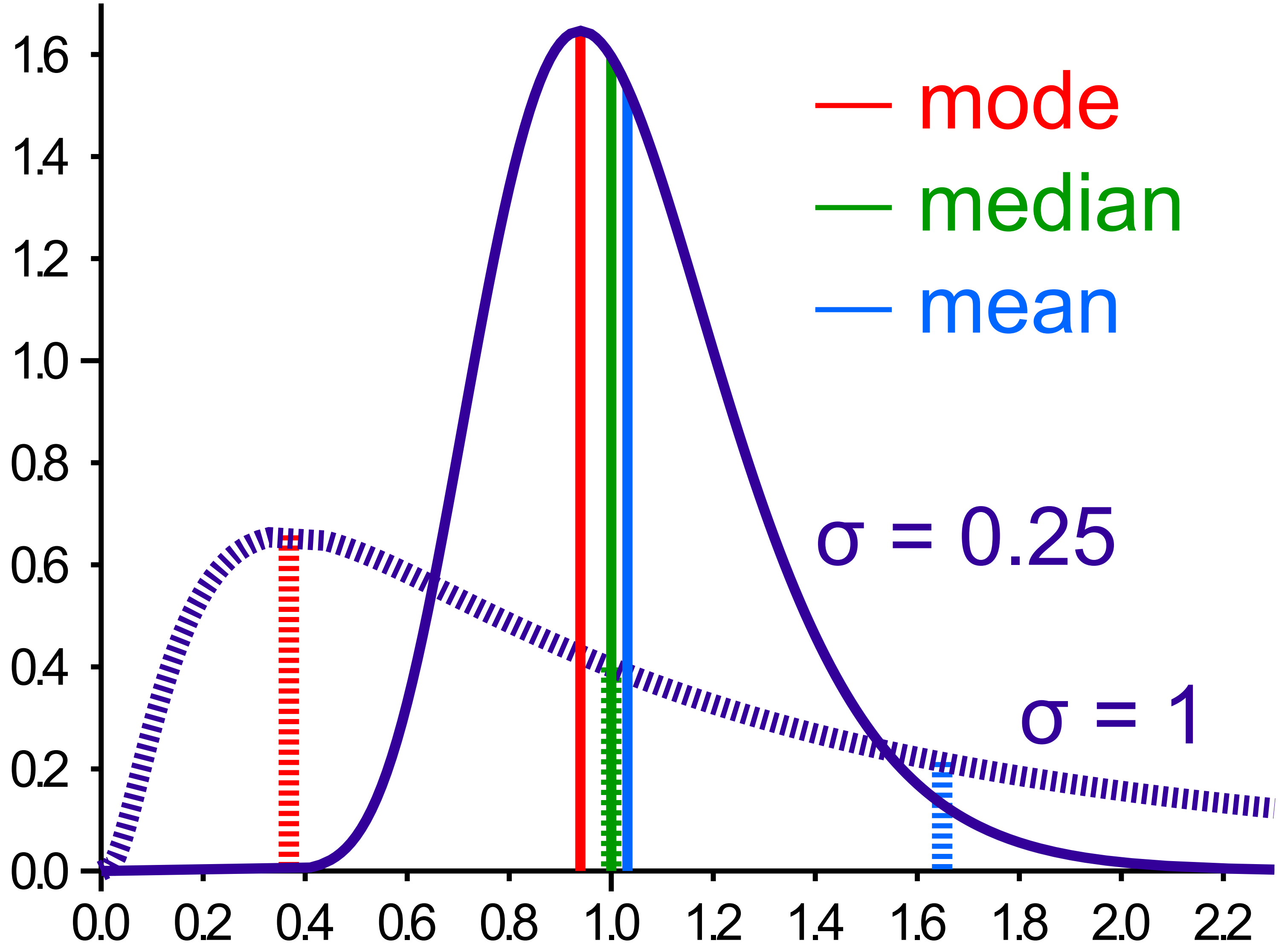


[1] Wikimedia

Measures of centrality

- Mean
- Median
- Mode

Measures of centrality



[1] Wikimedia

Measures of variability

- Variance
- Standard deviation
- Range

Measures of variability

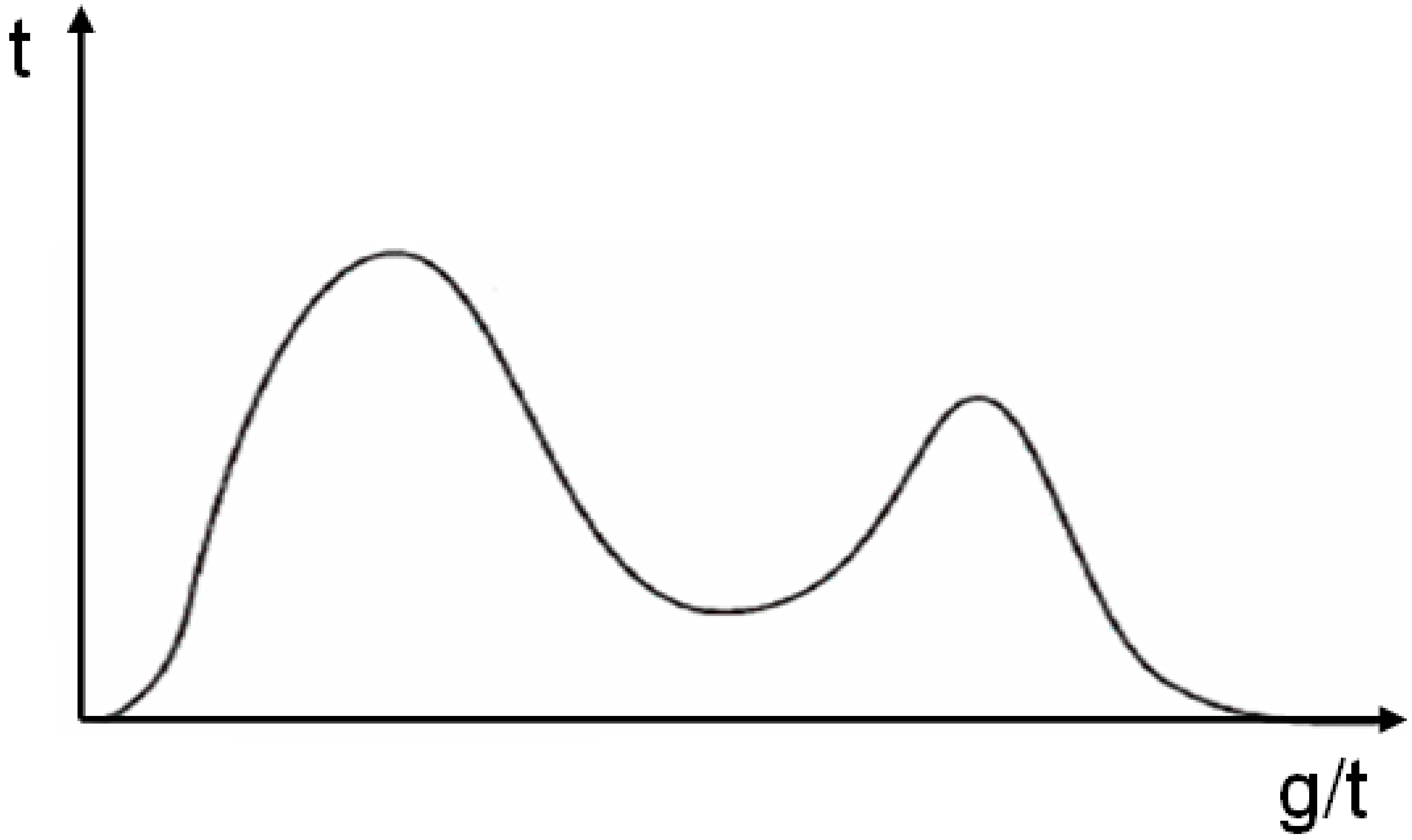
Variance

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

Standard Deviation

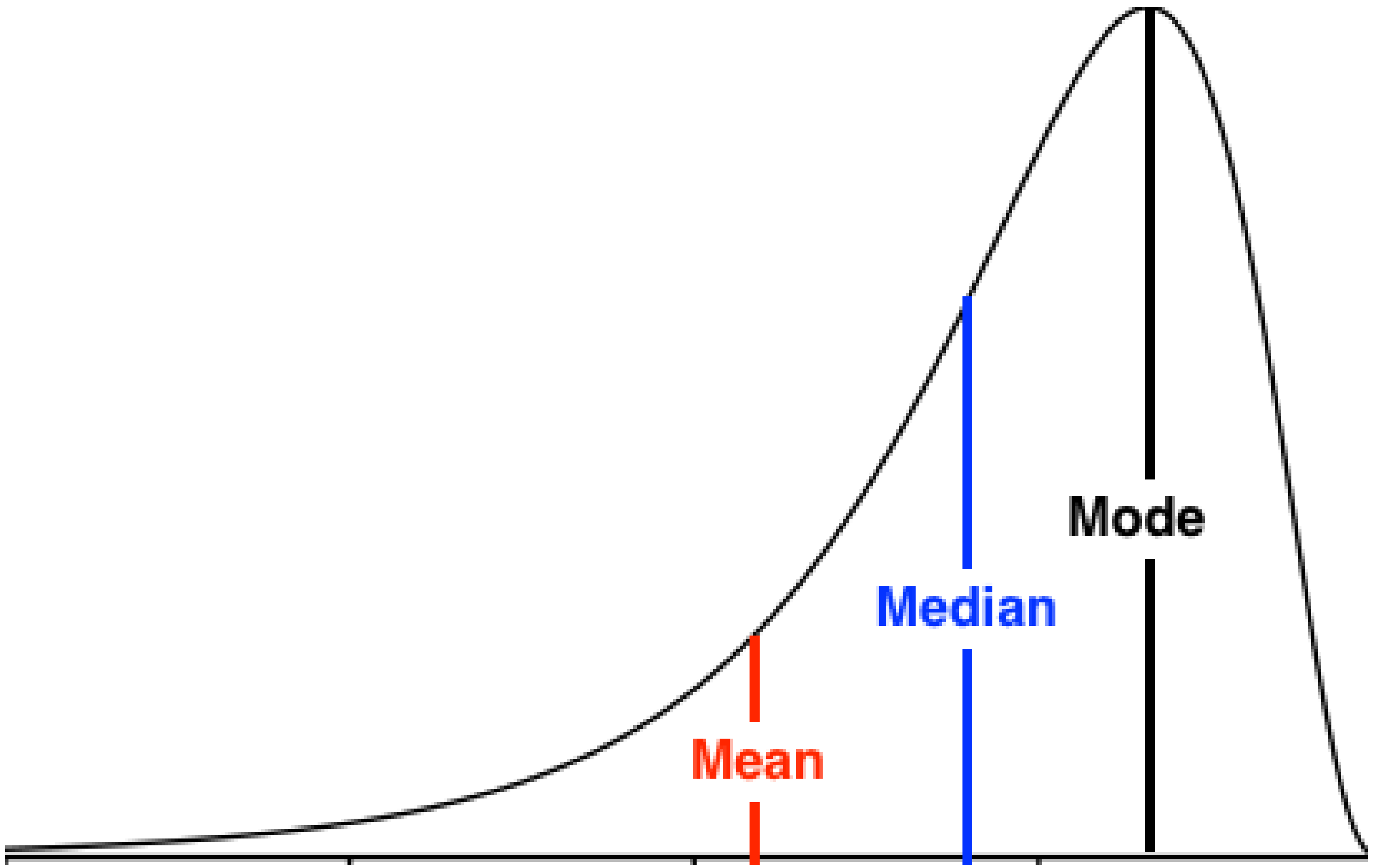
$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

Modality



[1] Wikimedia

Skewness



[1] Wikimedia

Summary

- Defining descriptive statistics
- Mean, median, and mode
- Standard deviation and variance
- Modality and skewness

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Categorical data

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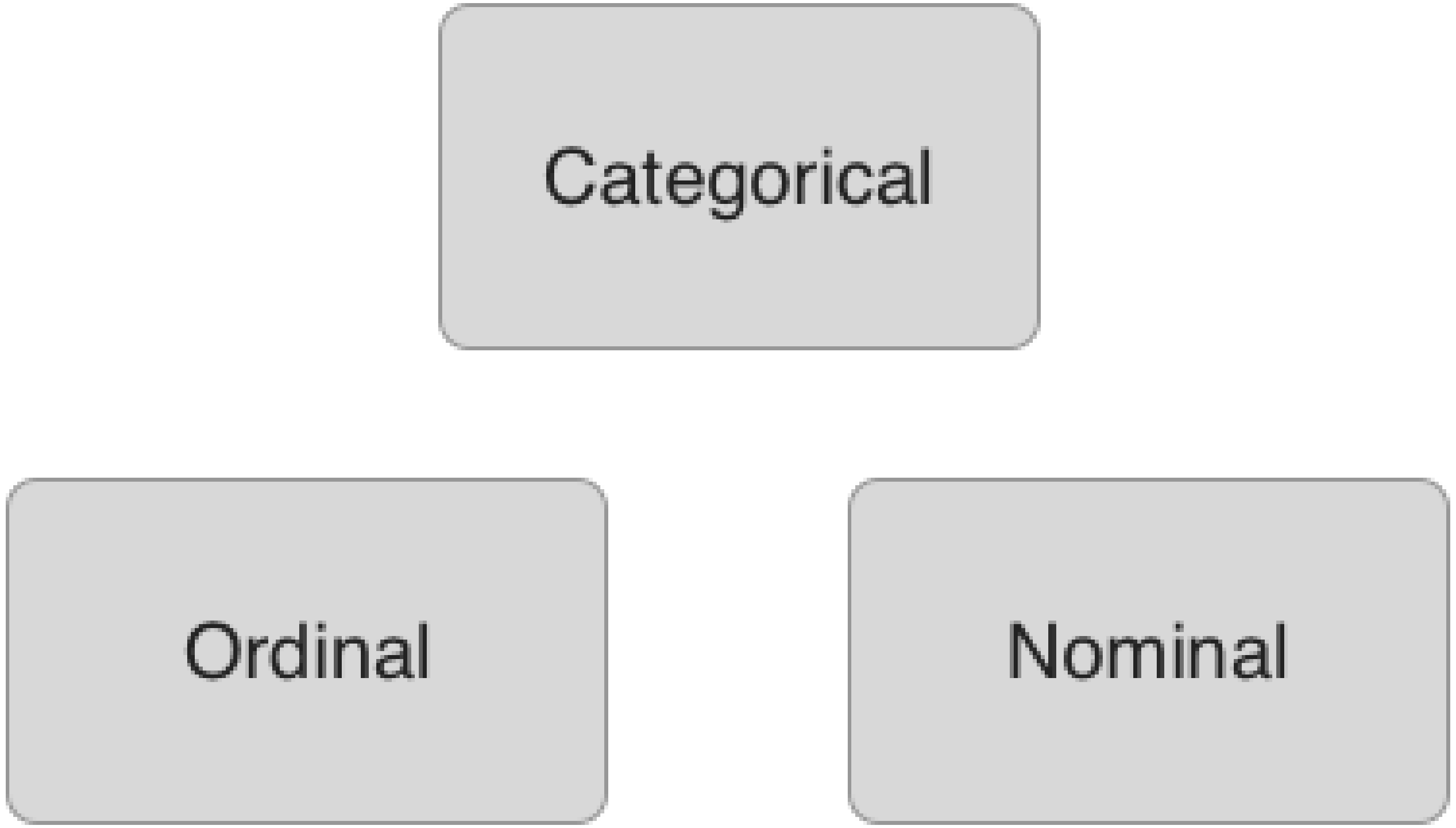
Types of variables

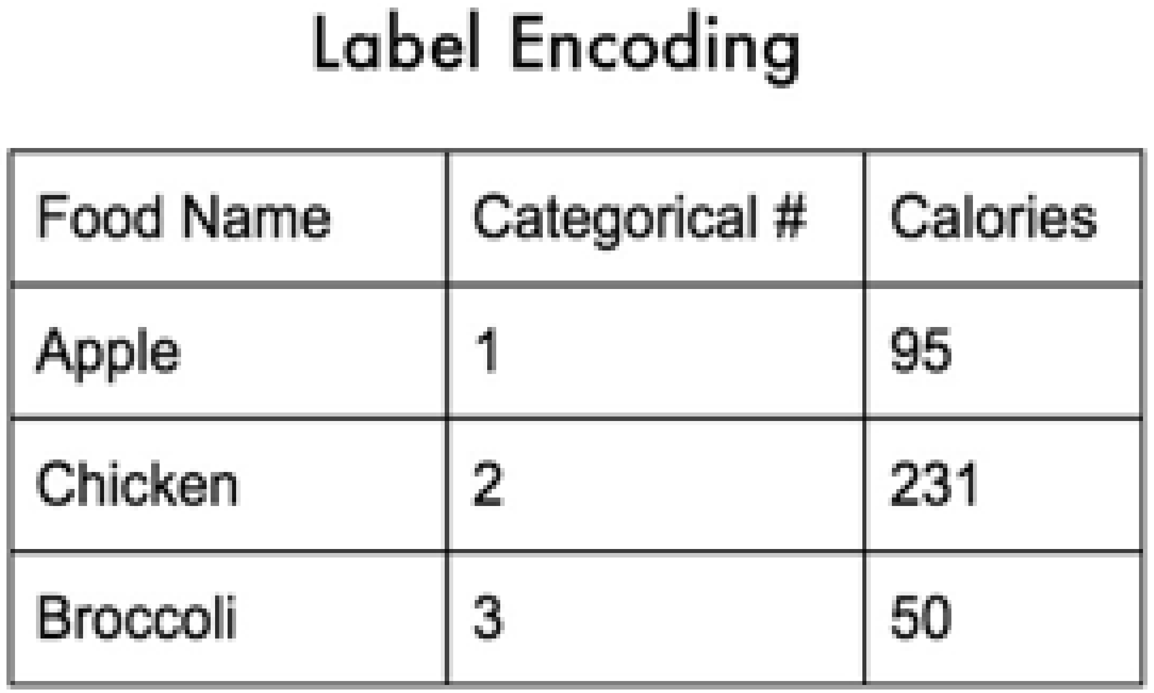


Categorical

Ordinal

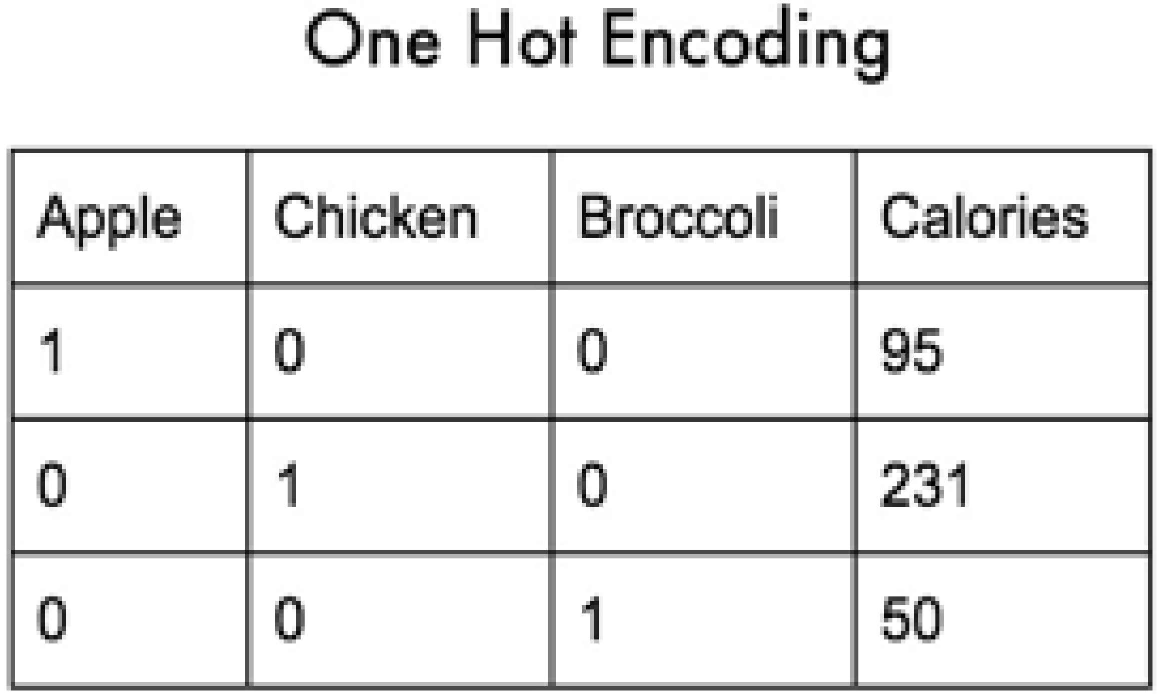
Nominal

Encoding categorical data



Label Encoding

Food Name	Categorical #	Calories
Apple	1	95
Chicken	2	231
Broccoli	3	50

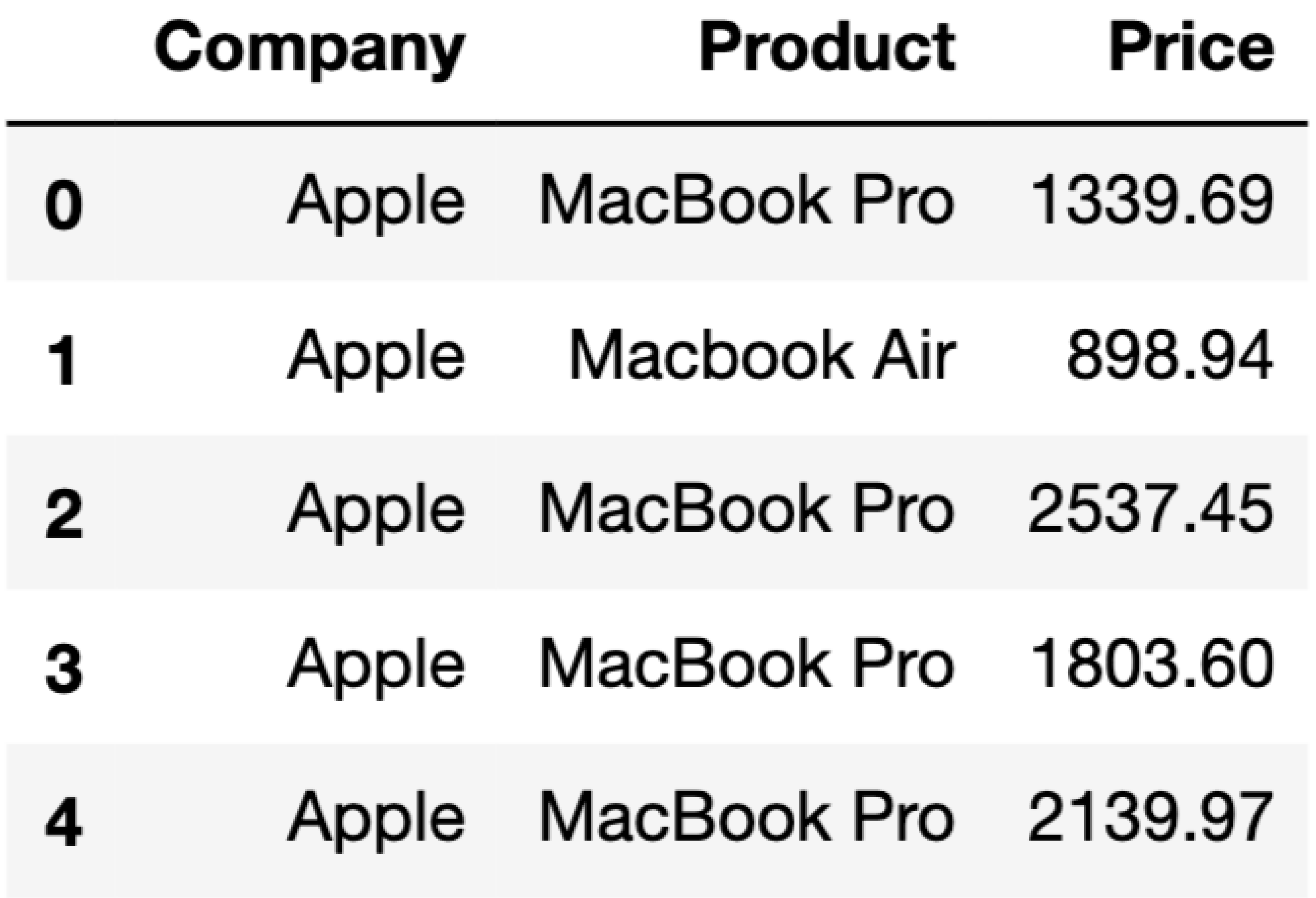


One Hot Encoding

Apple	Chicken	Broccoli	Calories
1	0	0	95
0	1	0	231
0	0	1	50

[1] What is One Hot Encoding and How to Do It

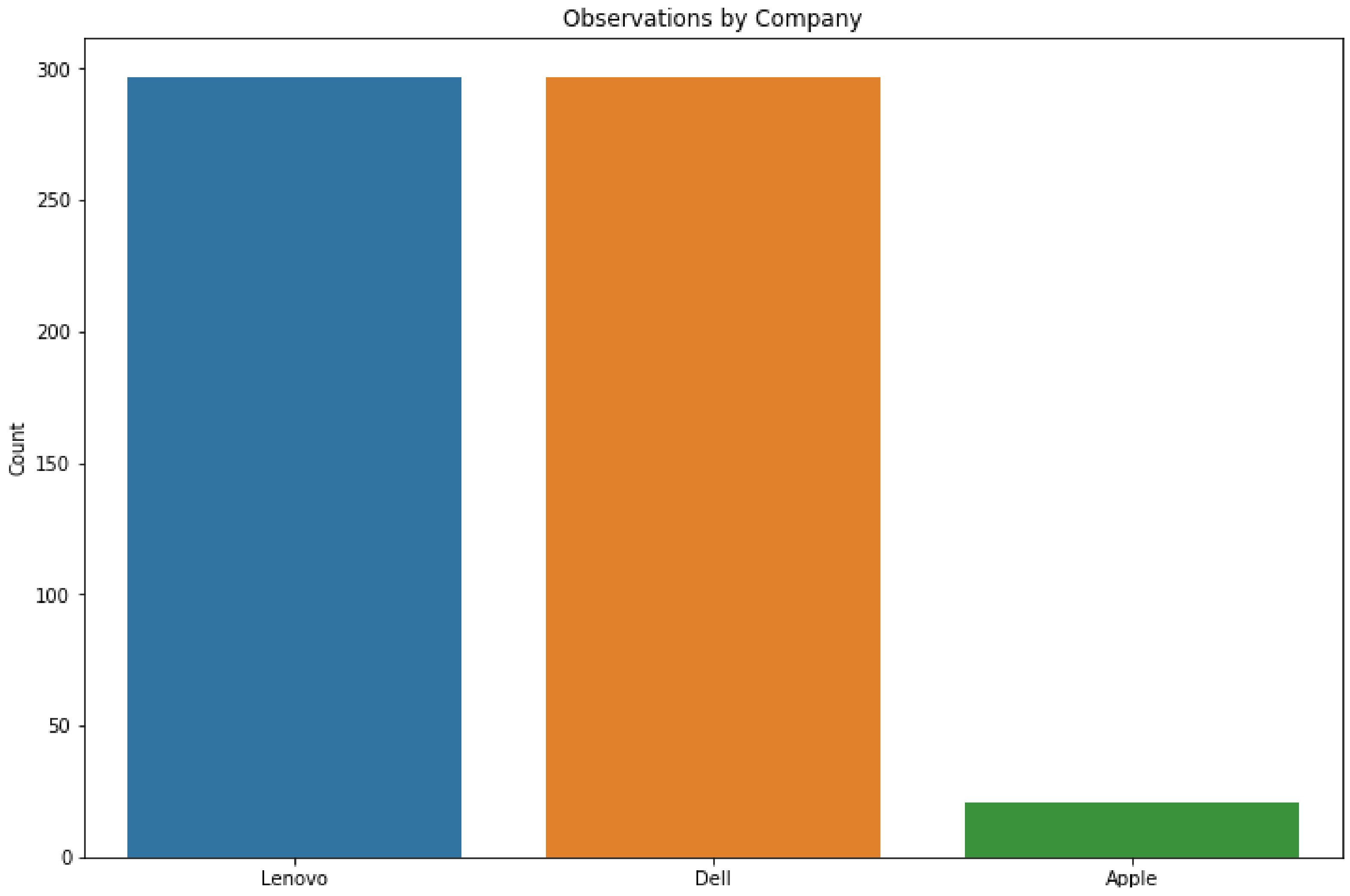
Example: laptop models



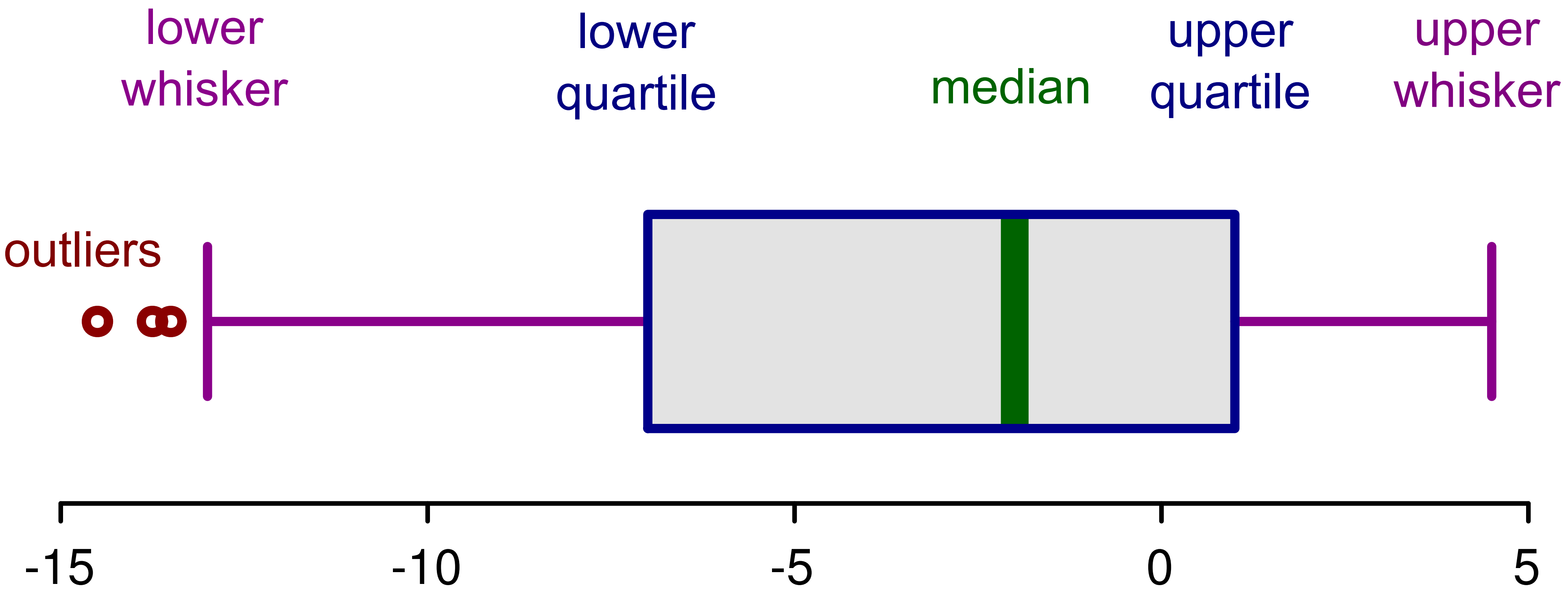
	Company	Product	Price
0	Apple	MacBook Pro	1339.69
1	Apple	Macbook Air	898.94
2	Apple	MacBook Pro	2537.45
3	Apple	MacBook Pro	1803.60
4	Apple	MacBook Pro	2139.97

Example: laptop models

```
company_count = df['Company'].value_counts()
sns.barplot(company_count.index, company_count.values)
```



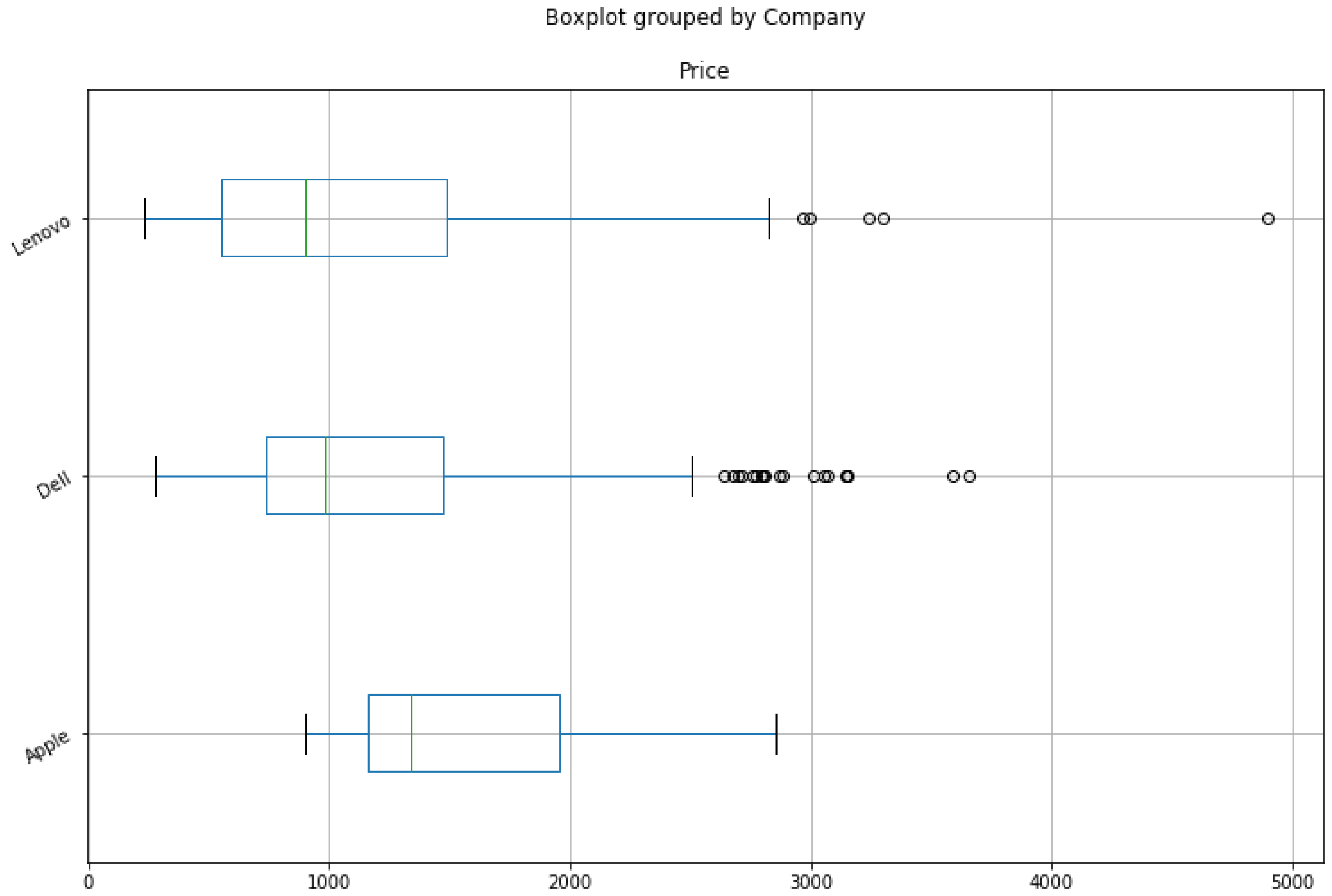
Box plots



[1] Wikimedia

Example: laptop models

```
df.boxplot('Price', 'Company', rot = 30, figsize=(12,8), vert=False)
```



Summary

- Types of variables
- Encoding techniques
- Sample exploratory data analysis

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Two or more variables

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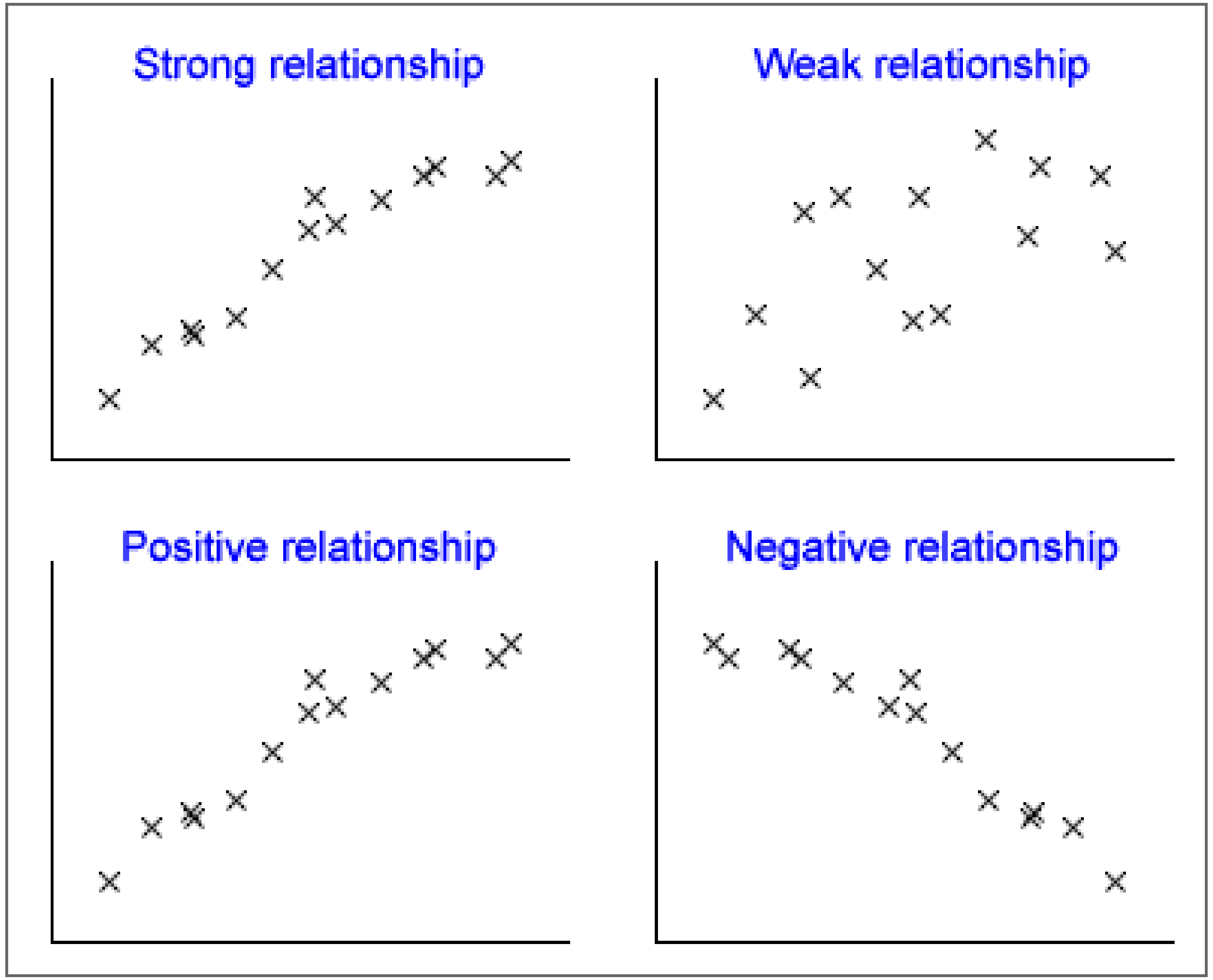
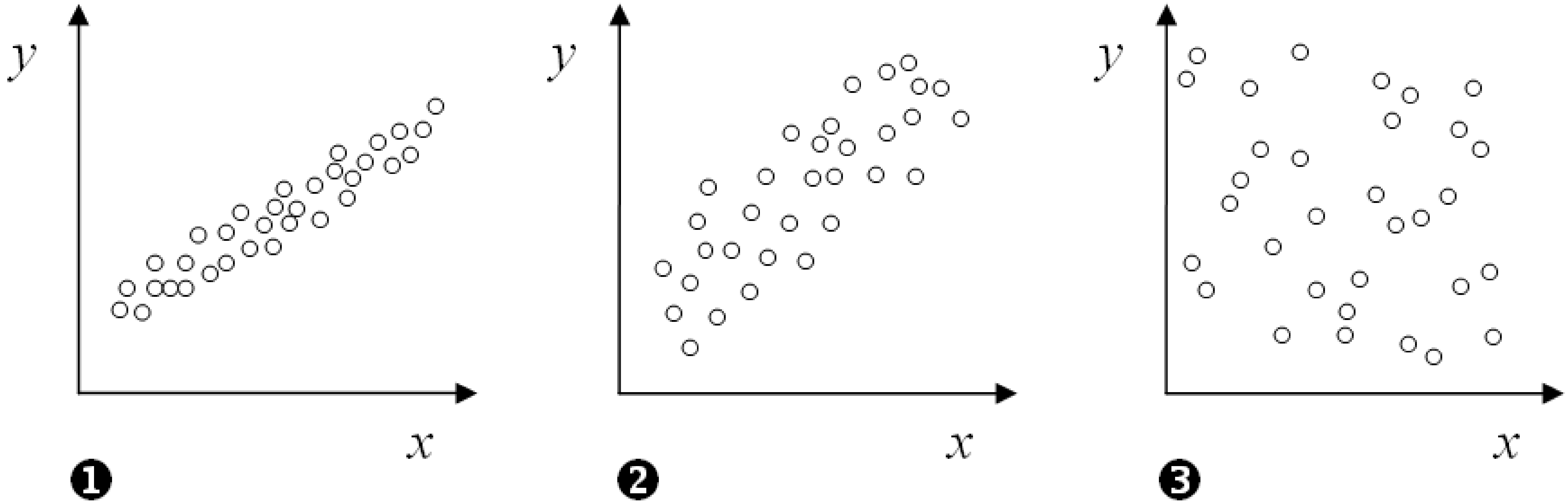
Types of relationships



[1] Wikimedia

What is correlation?

- Statistical relationship between variables
- Stronger correlation = more information



[1] Wikimedia

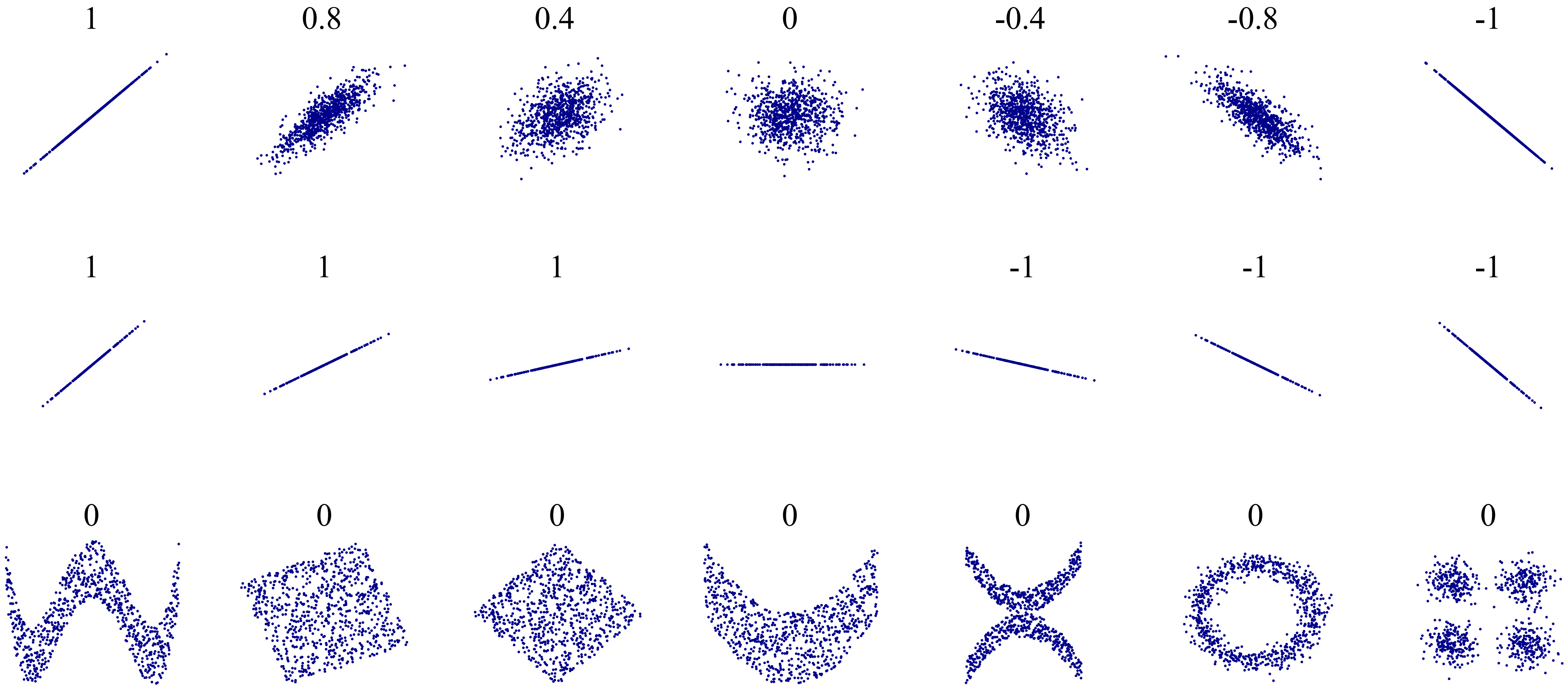
Covariance

$$\mathrm{Cov}_{xy} = \frac{\sum(x - \bar{x})(y - \bar{y})}{(n - 1)}$$

Pearson's correlation

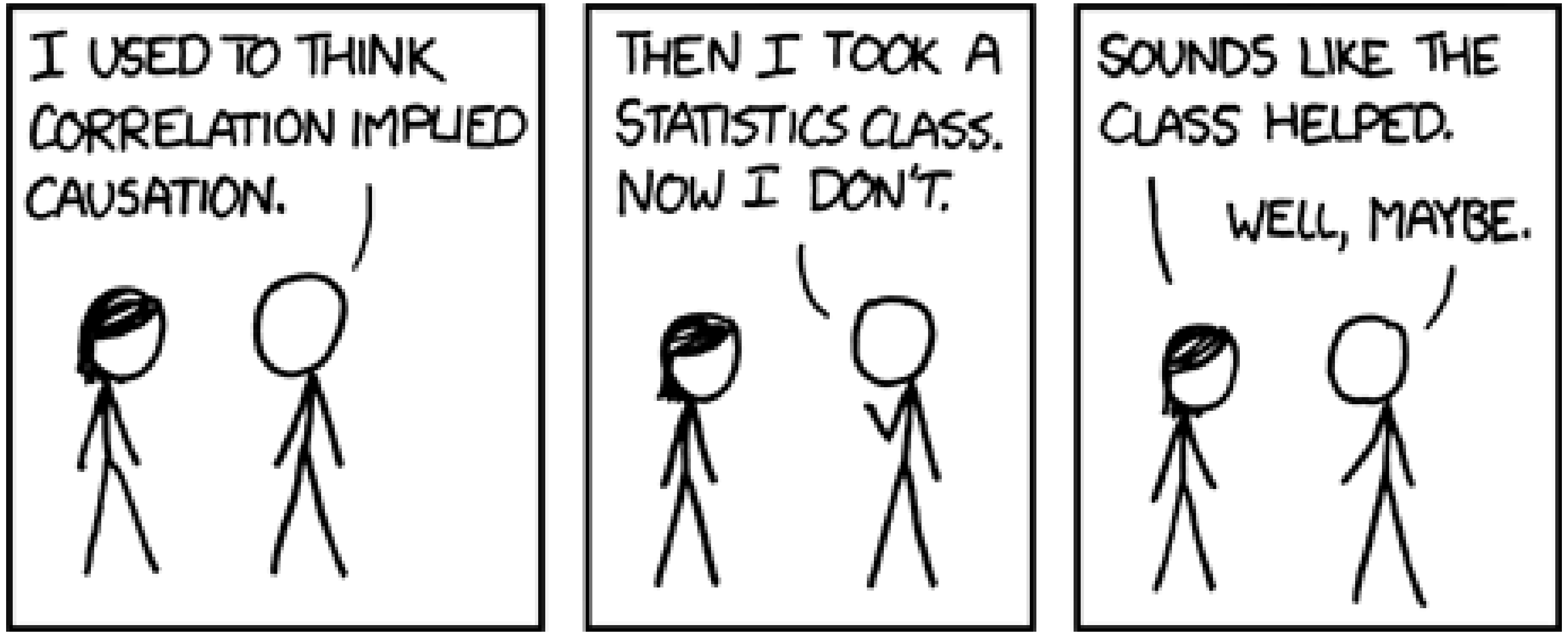
$$r = \frac{\mathrm{Cov}(x, y)}{S_x \cdot S_y}$$

Pearson's correlation



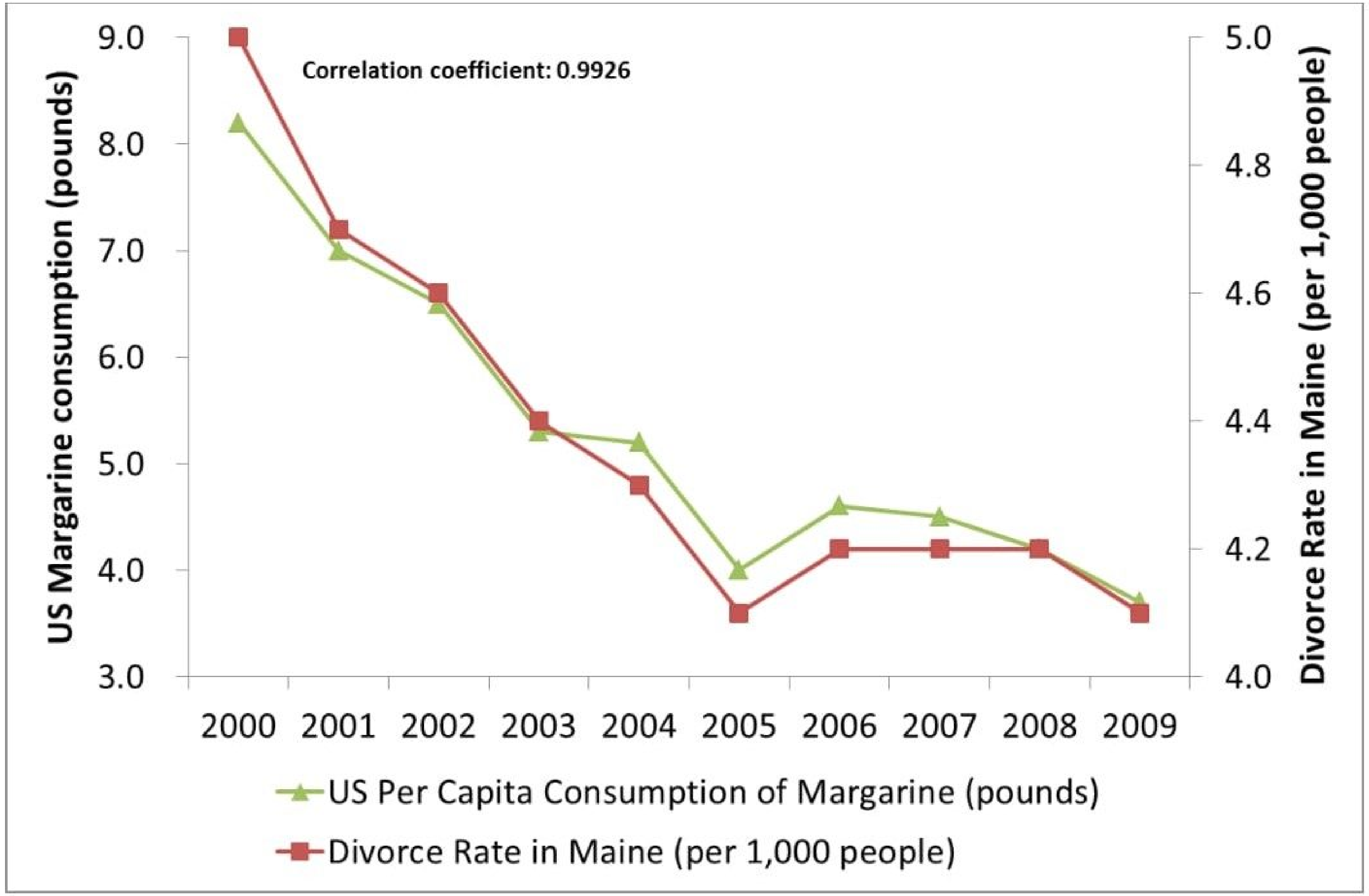
[1] Wikimedia

Correlation vs. causation


I USED TO THINK CORRELATION IMPLIED CAUSATION.
THEN I TOOK A STATISTICS CLASS. NOW I DON'T.
SOUNDS LIKE THE CLASS HELPED.
WELL, MAYBE.

[1] xkcd

Correlation vs. causation



[1] Correlation does not mean Causation

Summary

- Types of relationships
- Review of correlation
- Covariance
- Pearson's correlation
- Correlation vs. causation

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