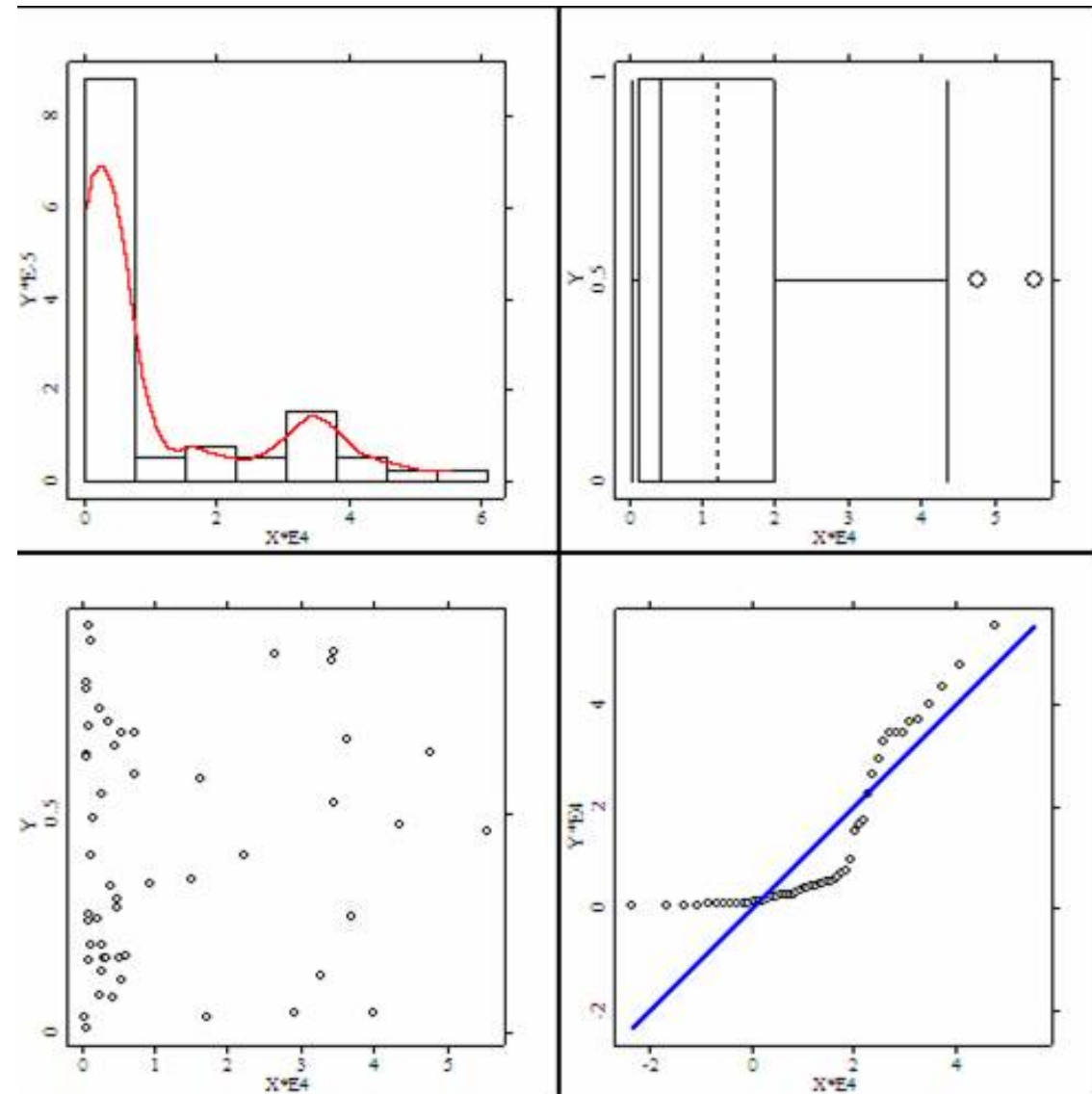# Descriptive statistics

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Conor Dewey
Data Scientist, Squarespace

What are descriptive statistics?
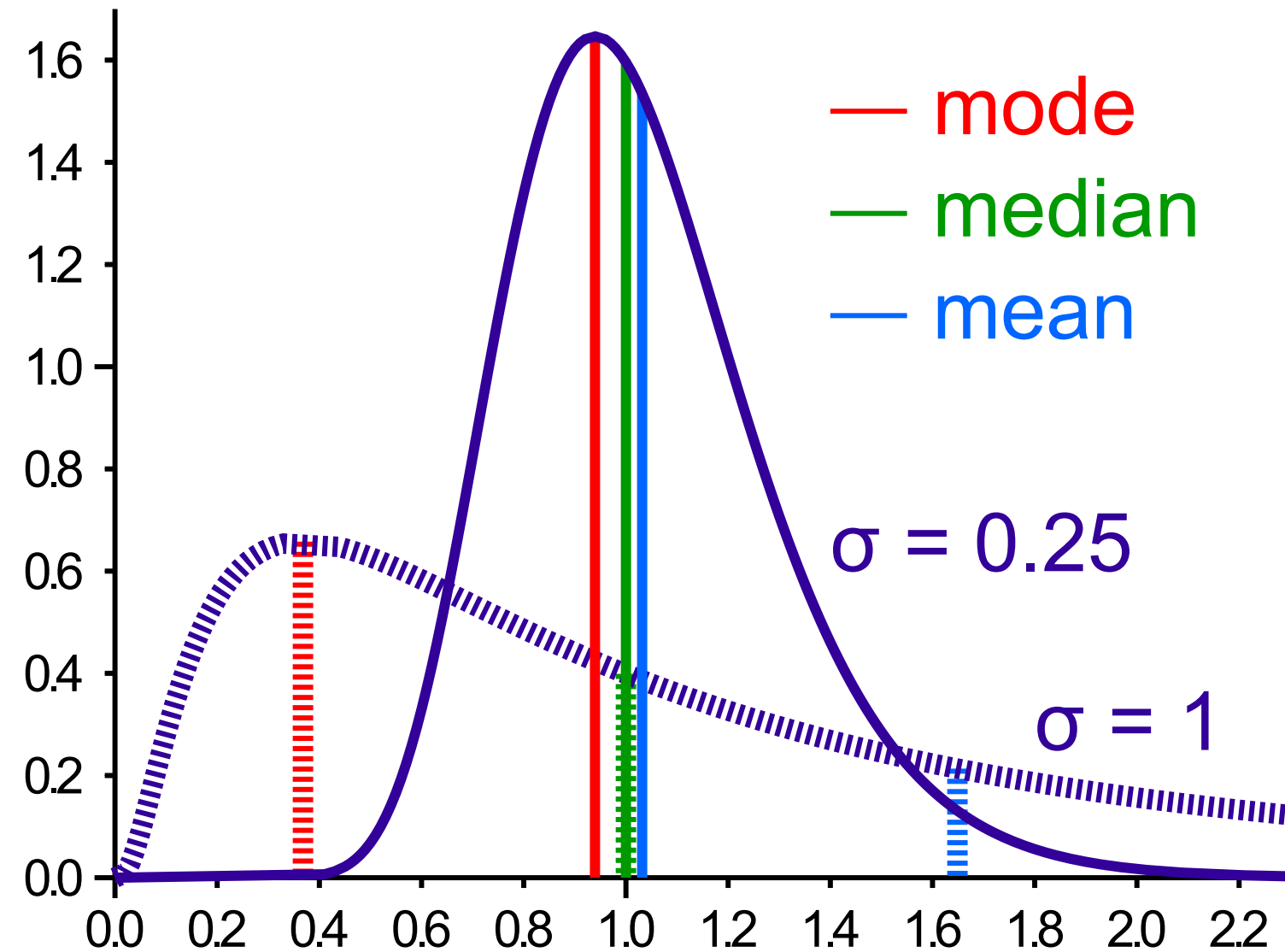
Measures of centrality

- Mean

- Median

- Mode

Measures of centrality

[1] Wikimedia

Measures of variability

- Variance

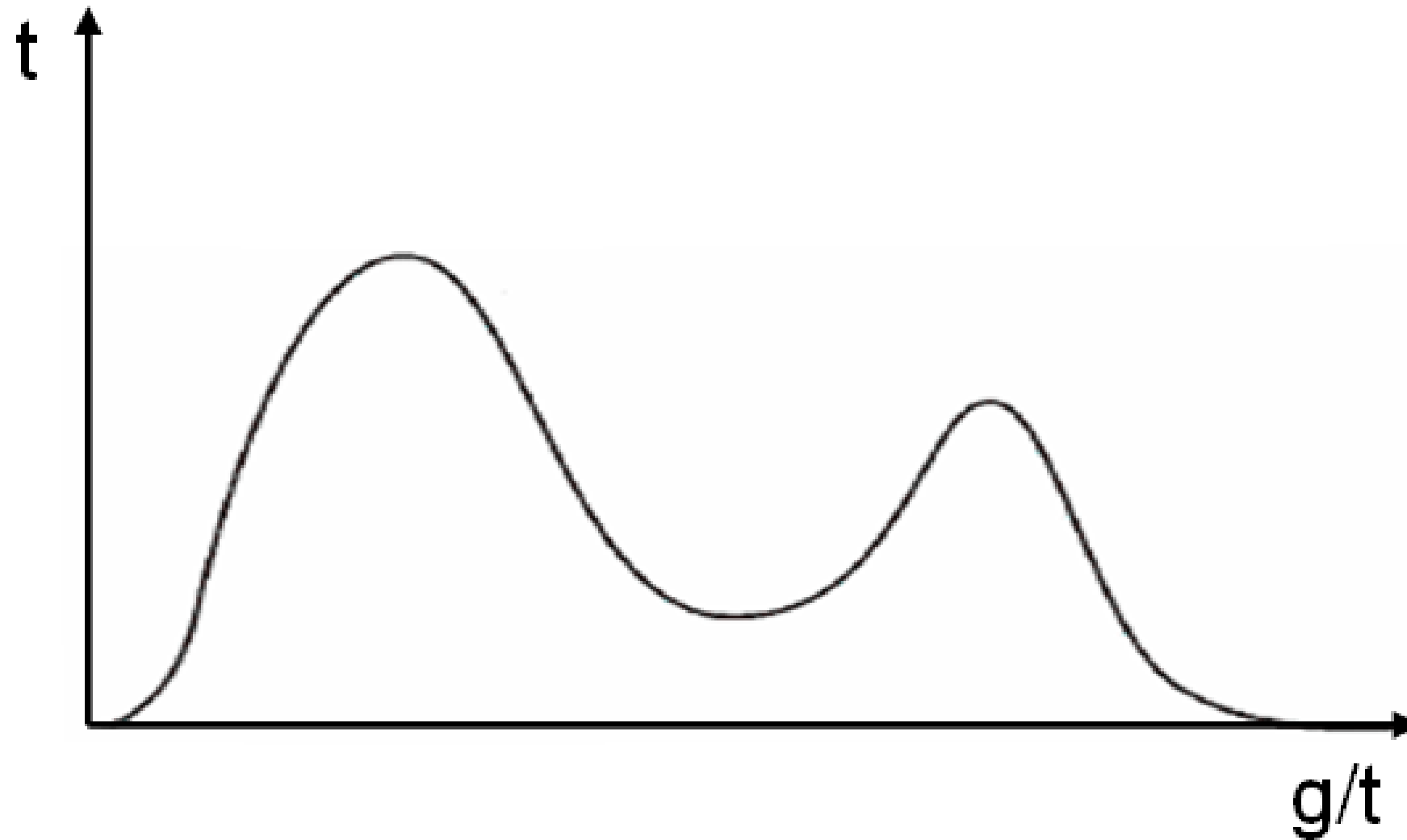- Standard deviation

- Range

Measures of variability

Variance

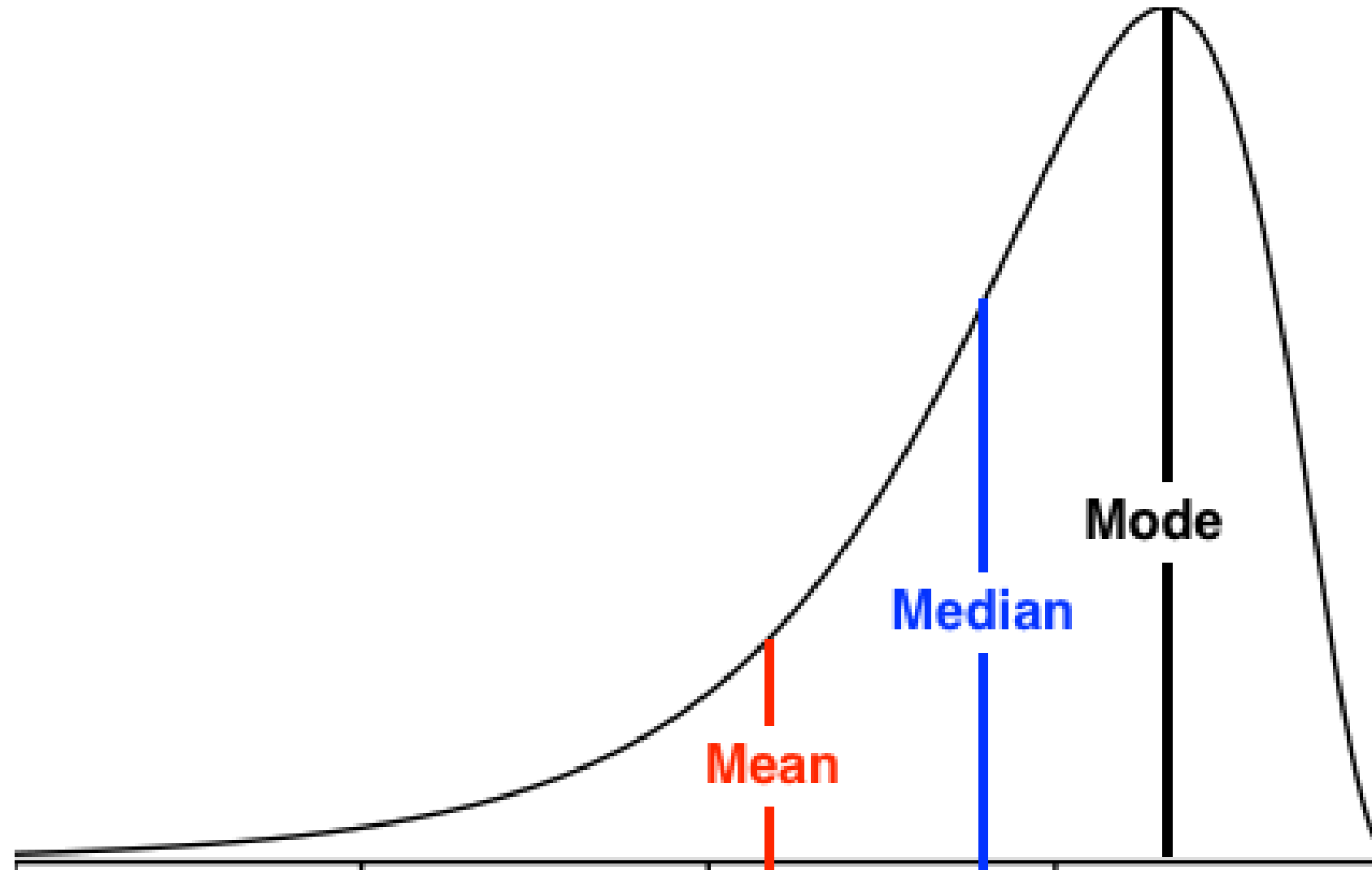$$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$$

Standard Deviation

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

Modality

Skewness

Mean

Median

Mode

Summary

- Defining descriptive statistics

- Mean, median, and mode

- Standard deviation and variance

- Modality and skewness

Let's prepare for the interview!

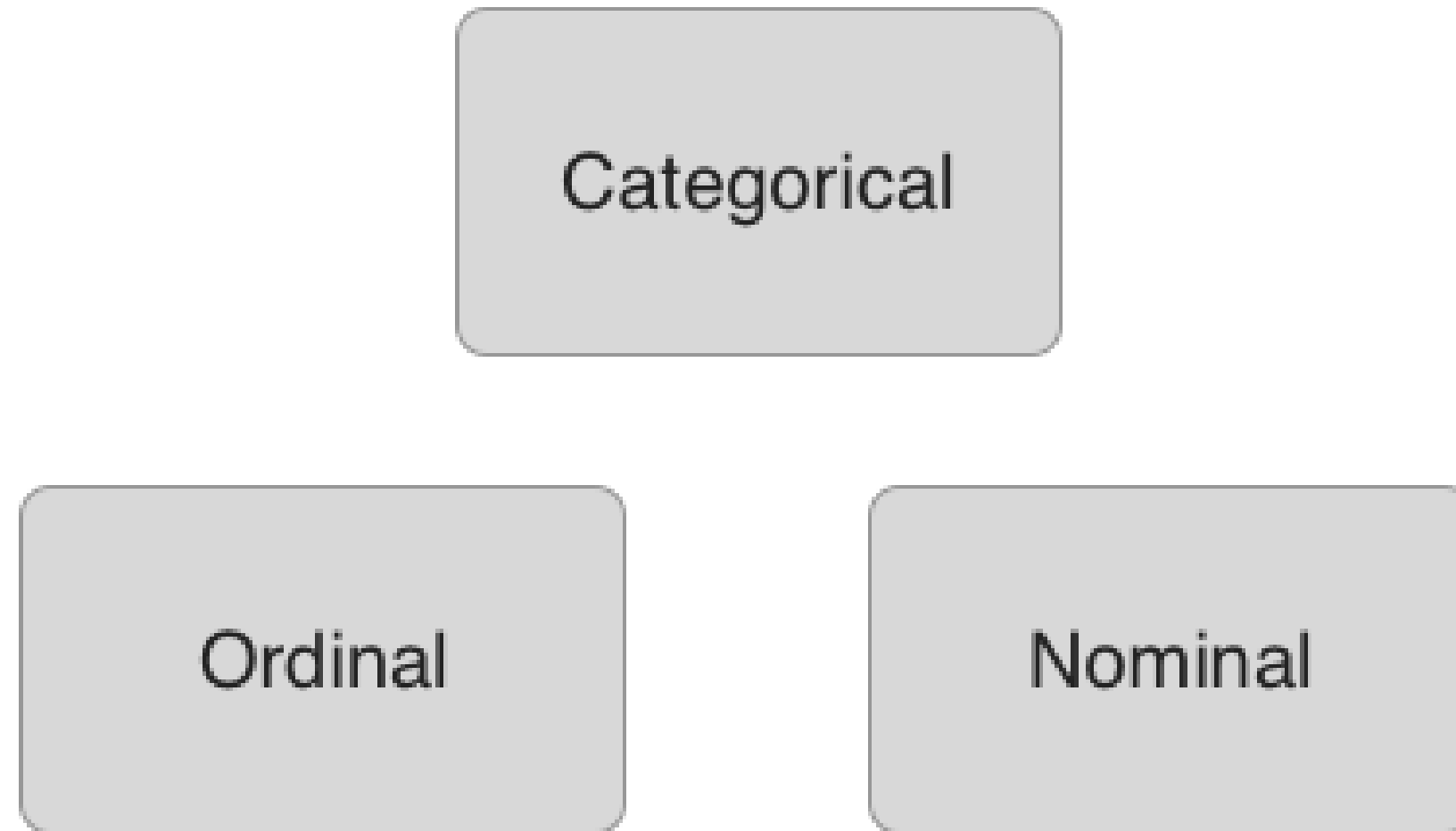PRACTICING STATISTICS INTERVIEW QUESTIONS IN PYTHON

Categorical data

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DataCamp

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

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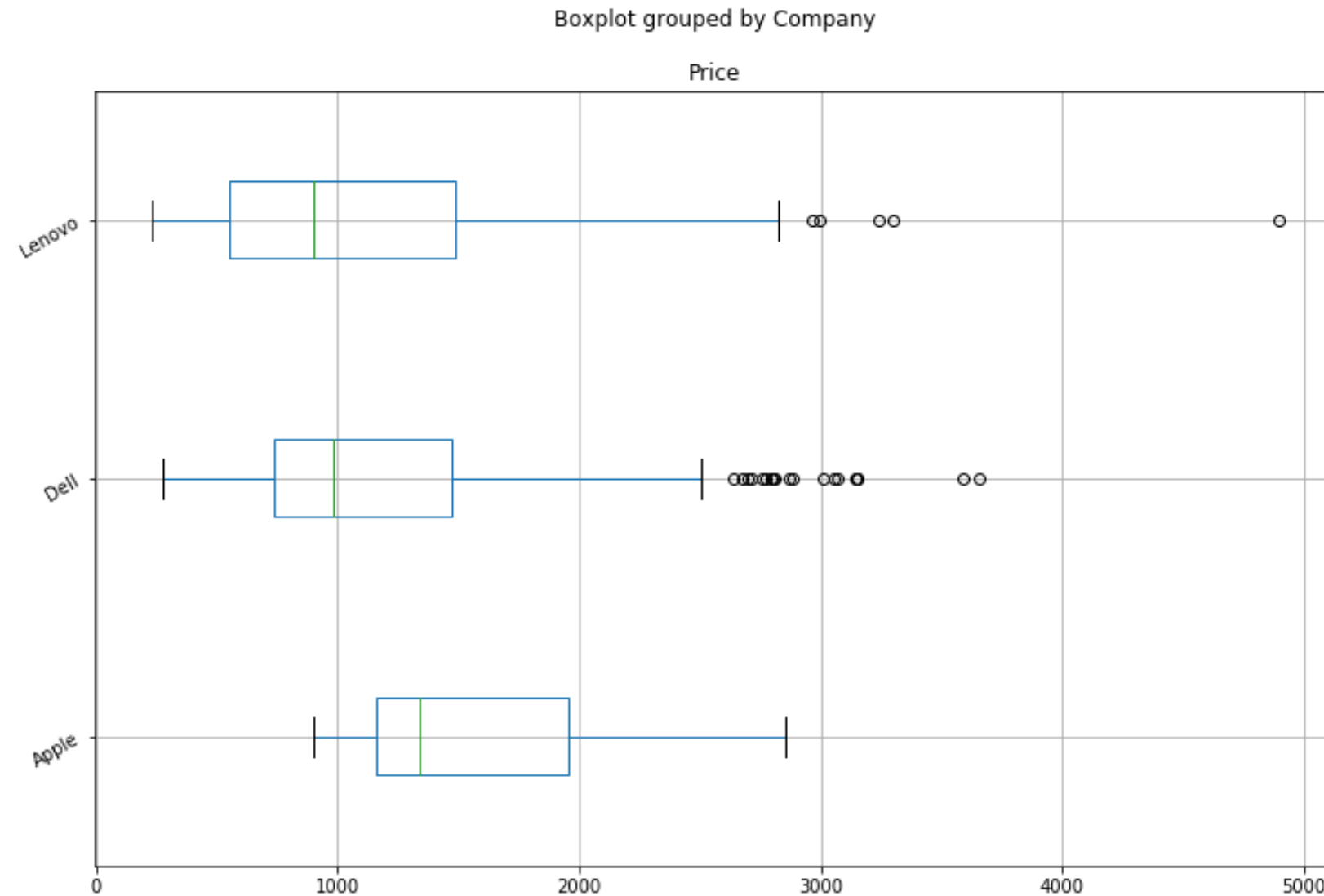

Observations by Company
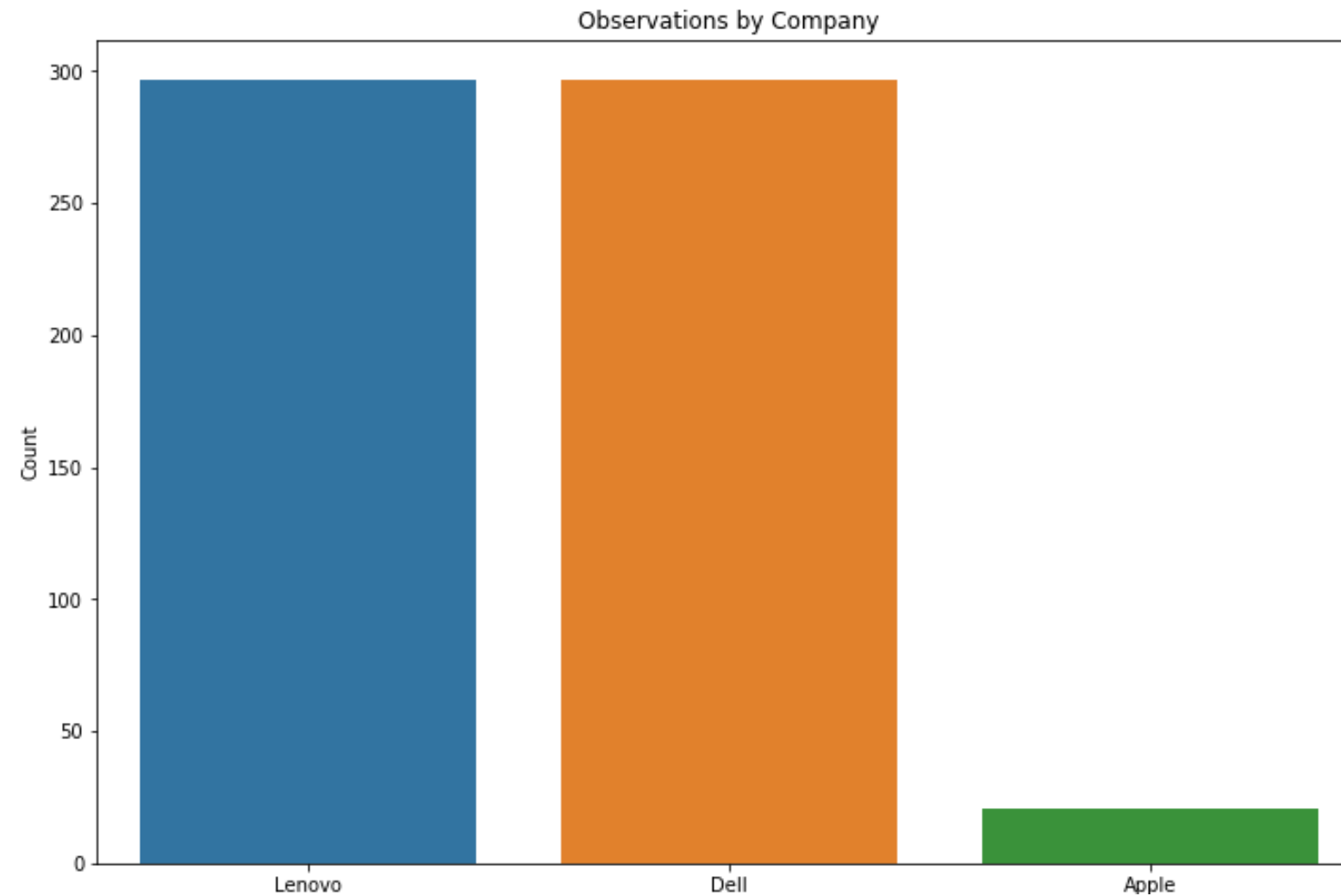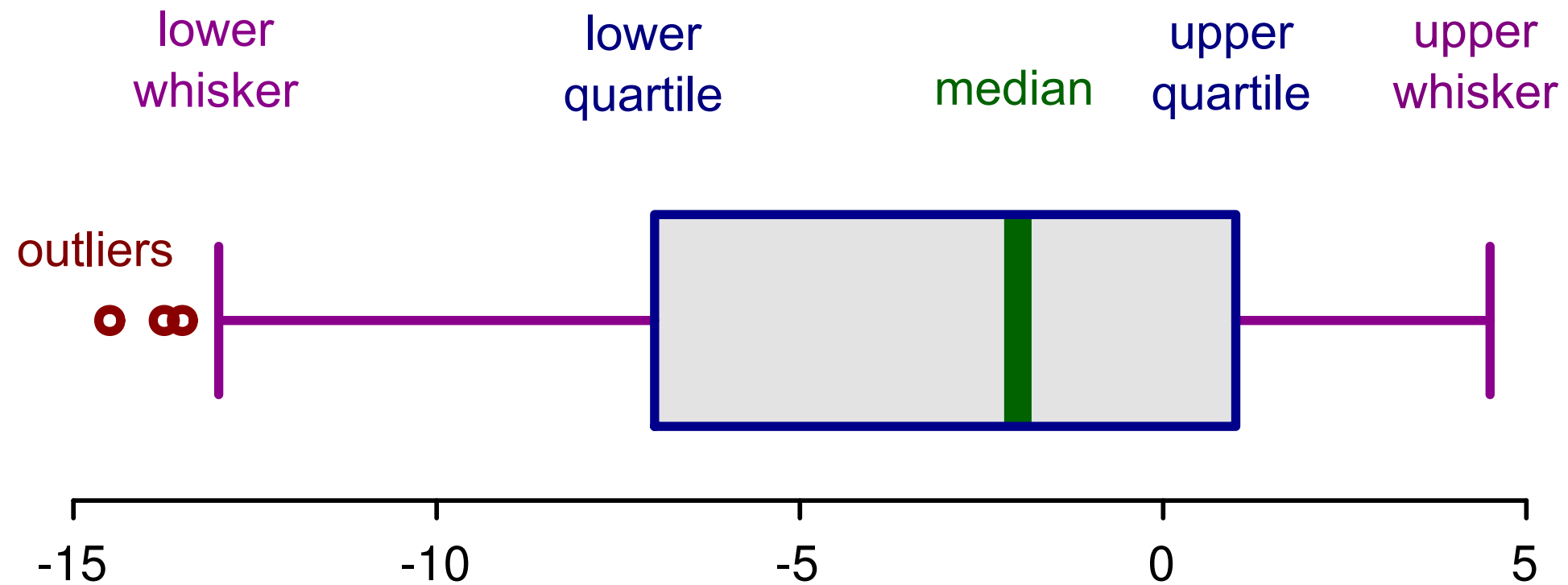
Box plots

Example: laptop models

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

Summary

- Types of variables

- Encoding techniques

- Sample exploratory data analysis

Let's prepare for the interview!
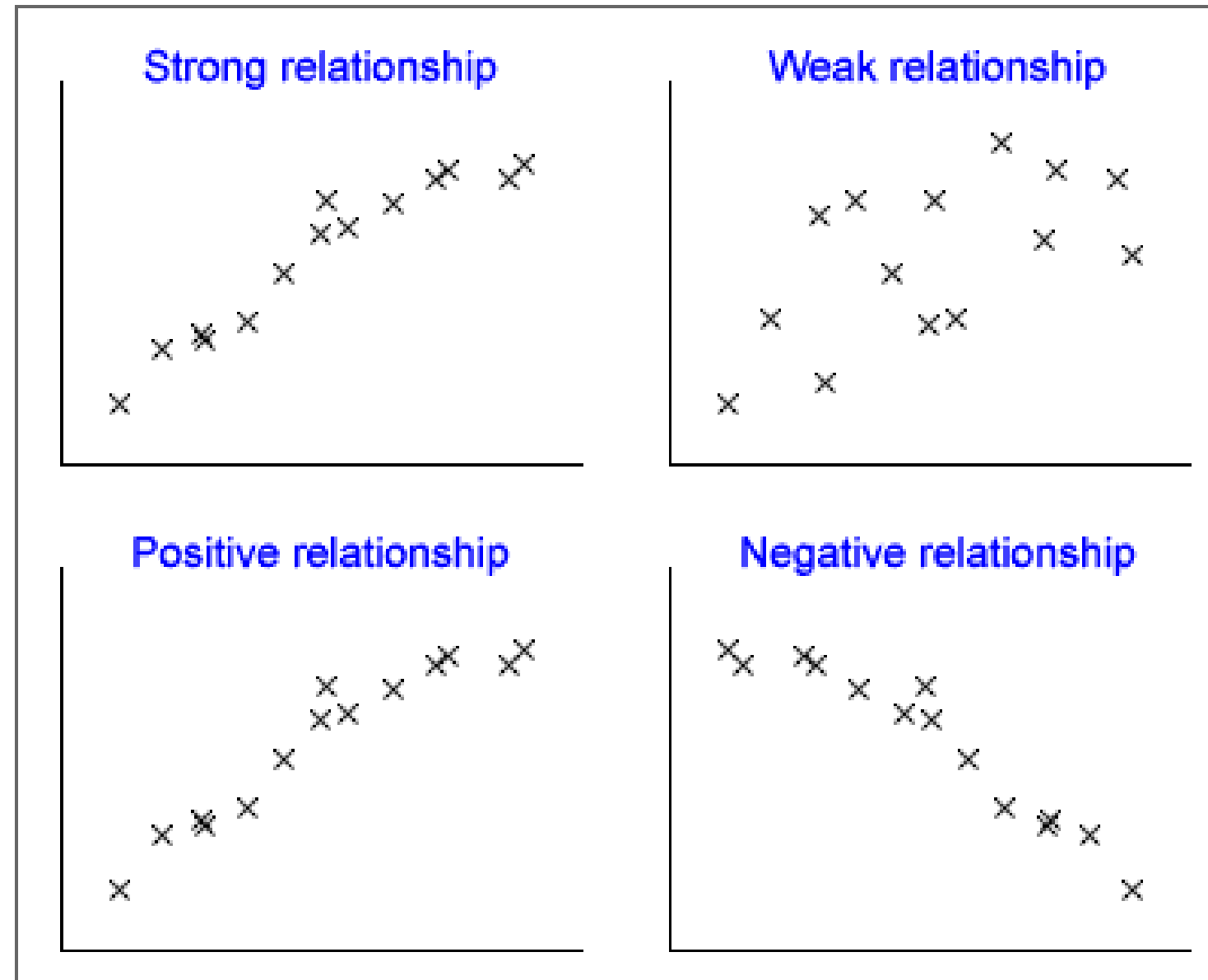
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Two or more variables

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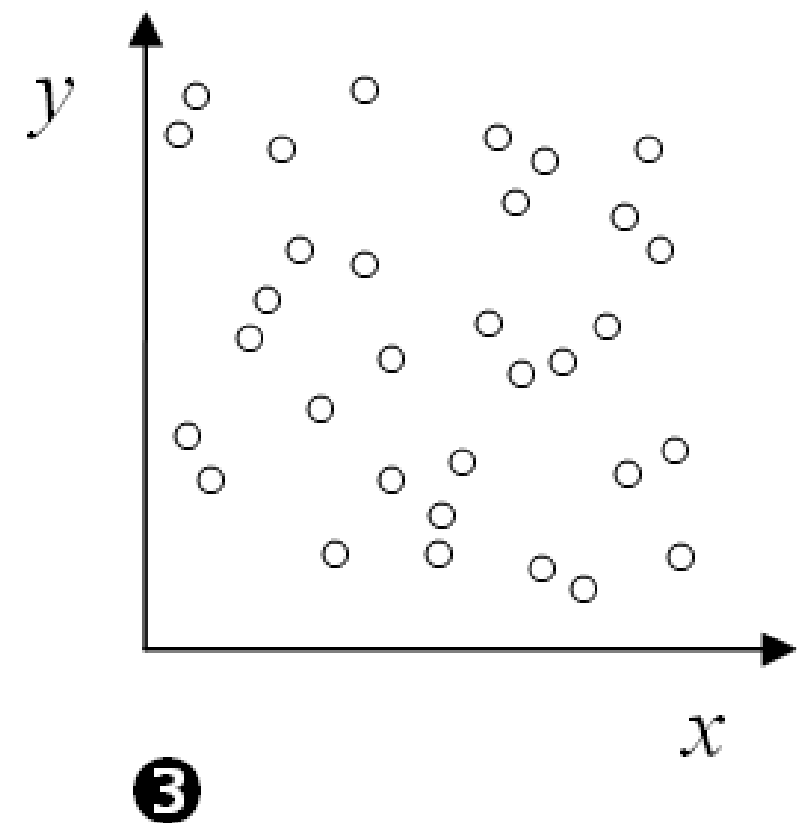
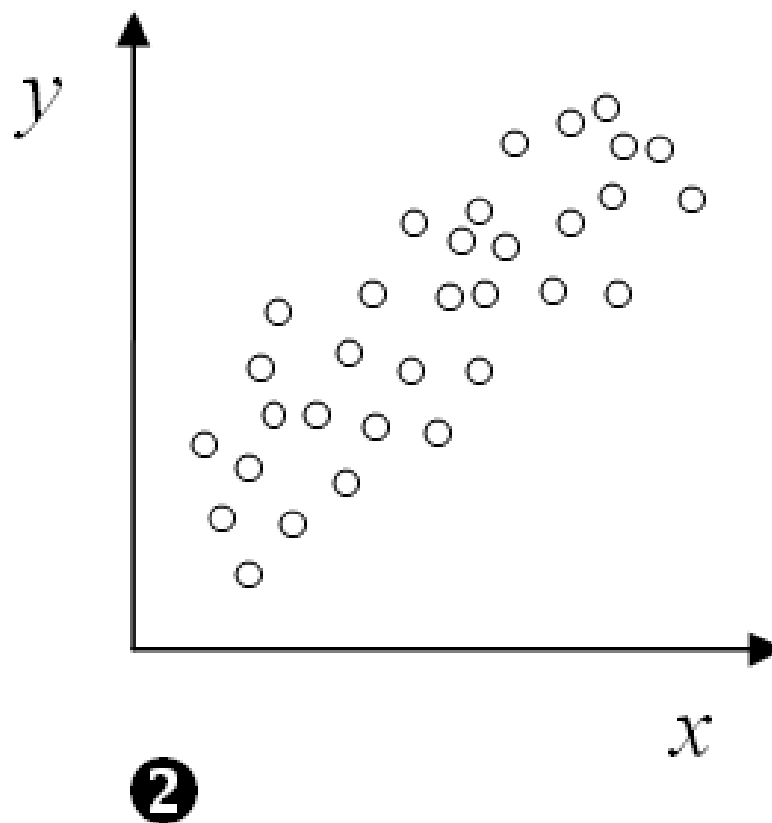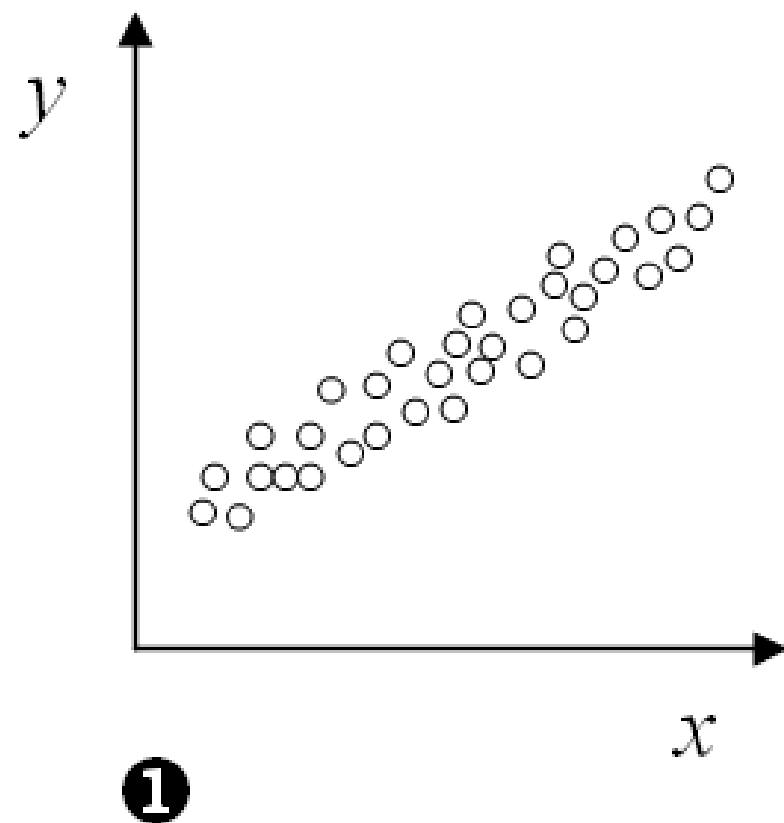**Conor Dewey**
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Types of relationships

What is correlation?

- Statistical relationship between variables

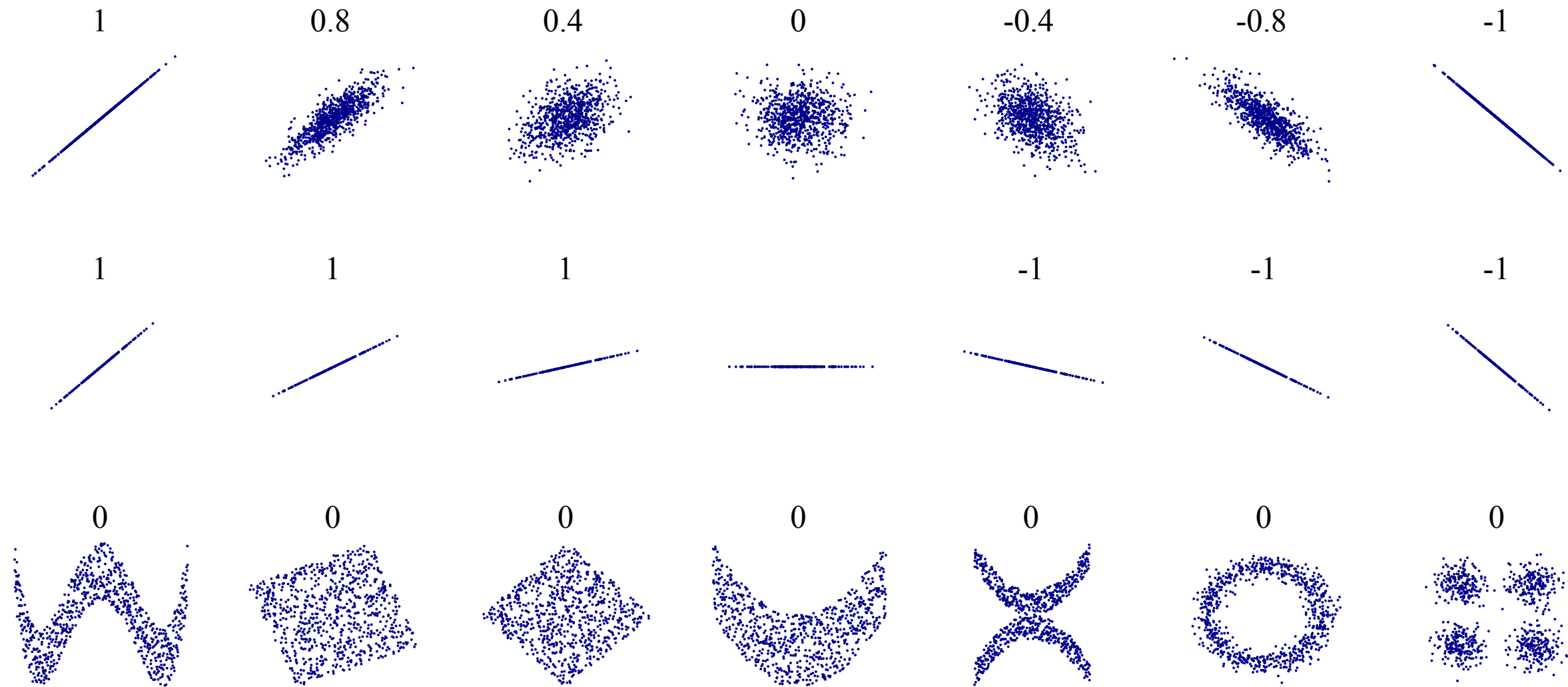- Stronger correlation = more information

[1] Wikimedia

Covariance

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

Pearson's correlation
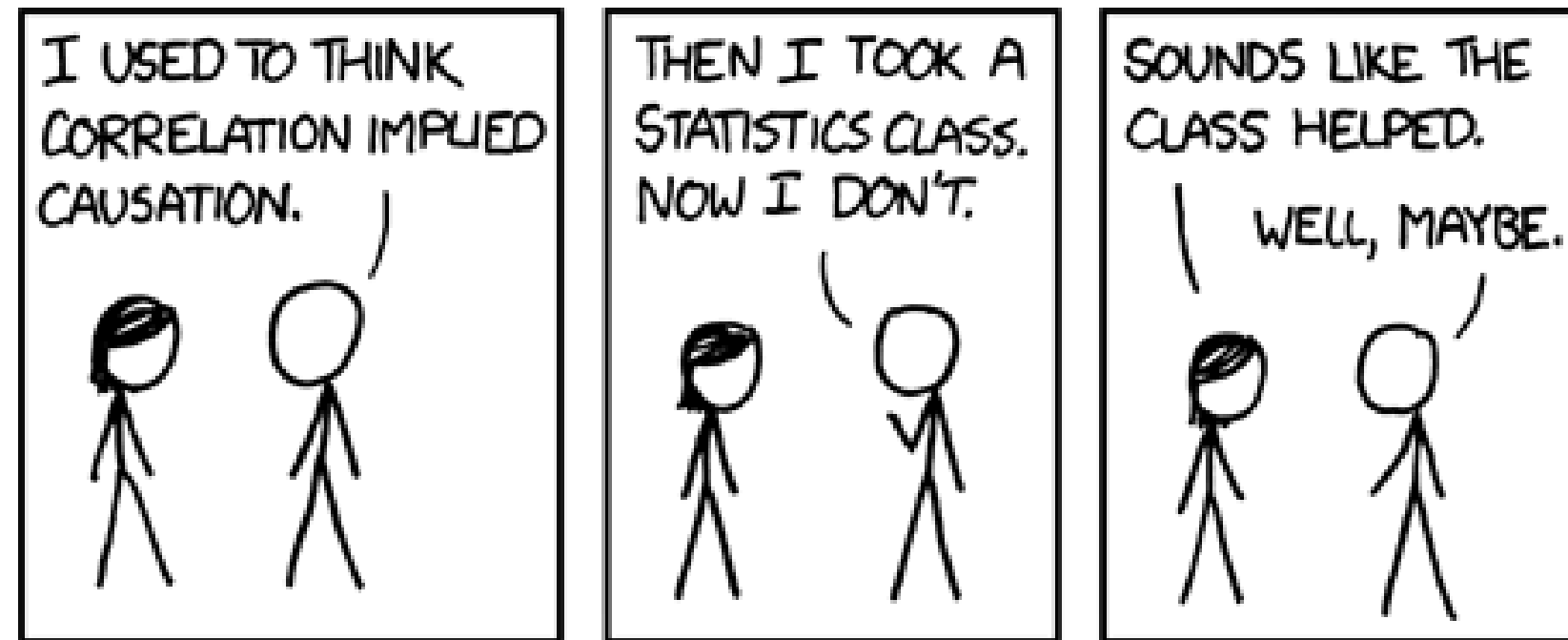
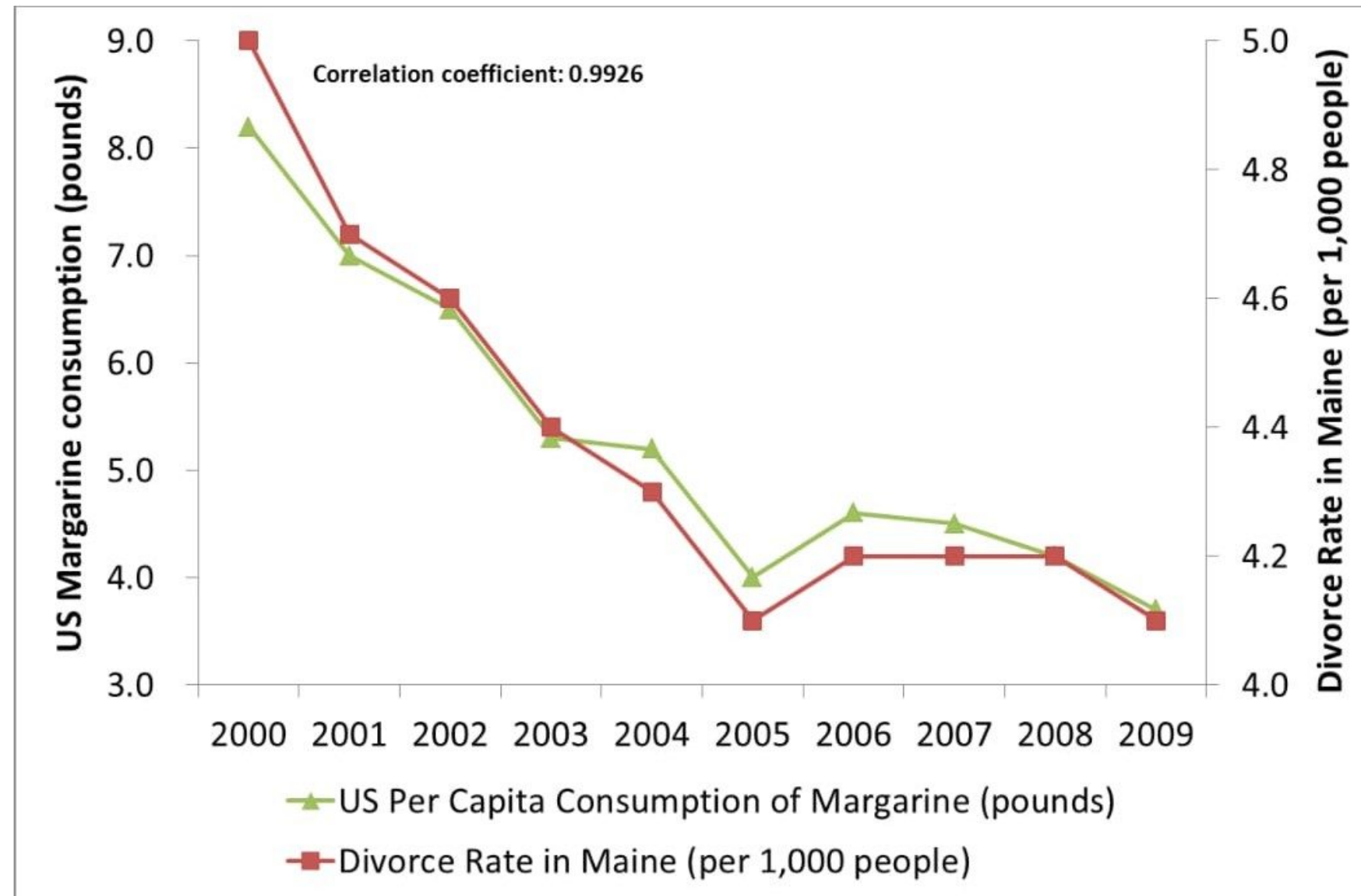$$r = \frac{\text{Cov}(x, y)}{S_x \cdot S_y}$$

Pearson's correlation

[1] Wikimedia

Correlation vs. causation

Correlation vs. causation

[1] Correlation does not mean Causation

Summary

- Types of relationships

- Review of correlation

- Covariance

- Pearson's correlation

- Correlation vs. causation

Let's prepare for the interview!

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