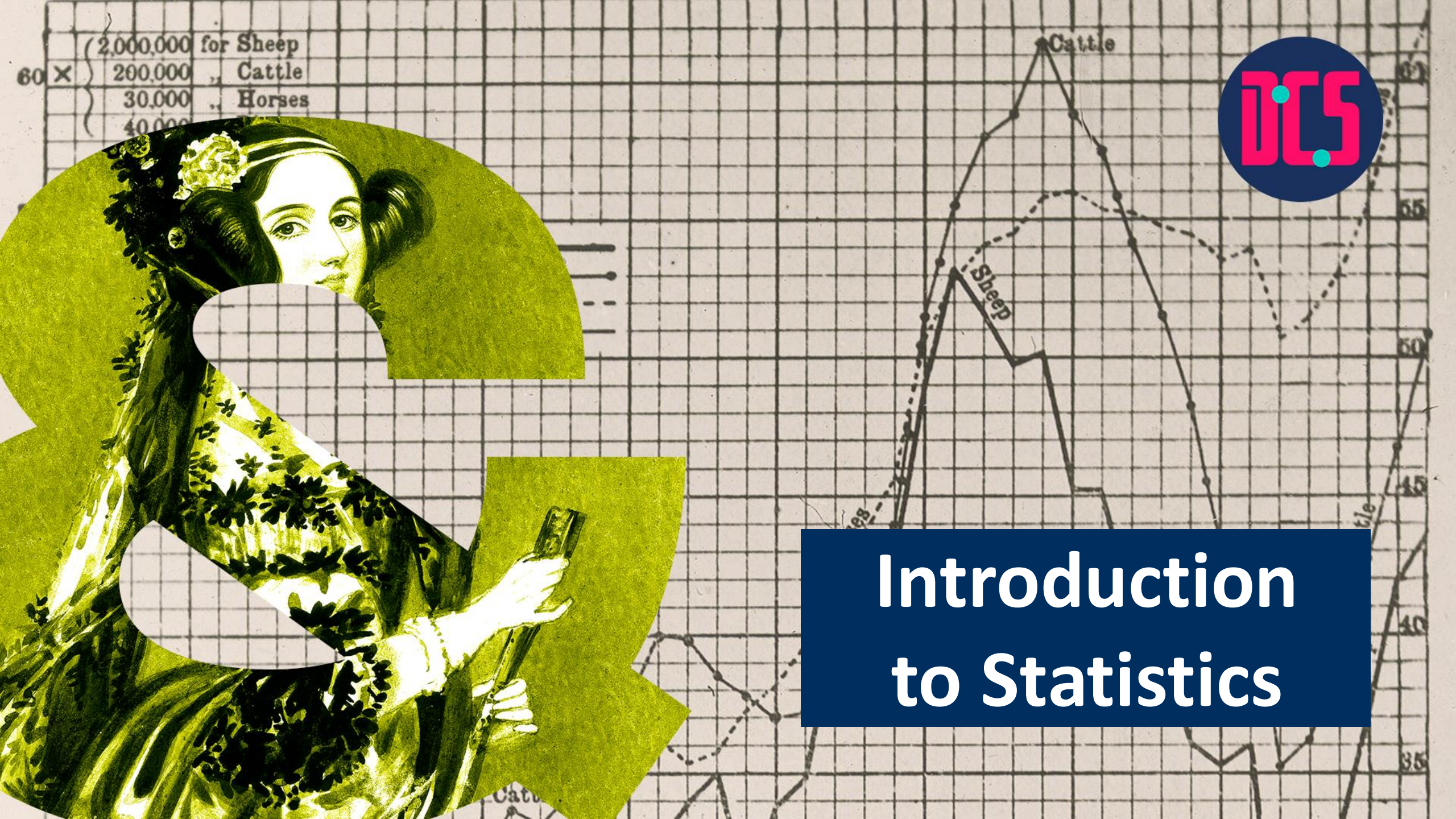

Introduction to Statistics

THE UNIVERSITY of EDINBURGH
Centre for Data, Culture & Society

DATA CULTURE SOCIETY

Welcome!

Chris Oldnall

Rhys Davies

Descriptive vs Inferential

Descriptive statistics involve summarizing and presenting the main features of a dataset, such as measures of central tendency (mean, median, mode) and measures of variability (range, standard deviation).

Inferential statistics, aims to make predictions or draw conclusions about a population based on a sample of data, using probability theory and statistical inference techniques like hypothesis testing and confidence intervals.

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Session A:
Descriptive Statistics

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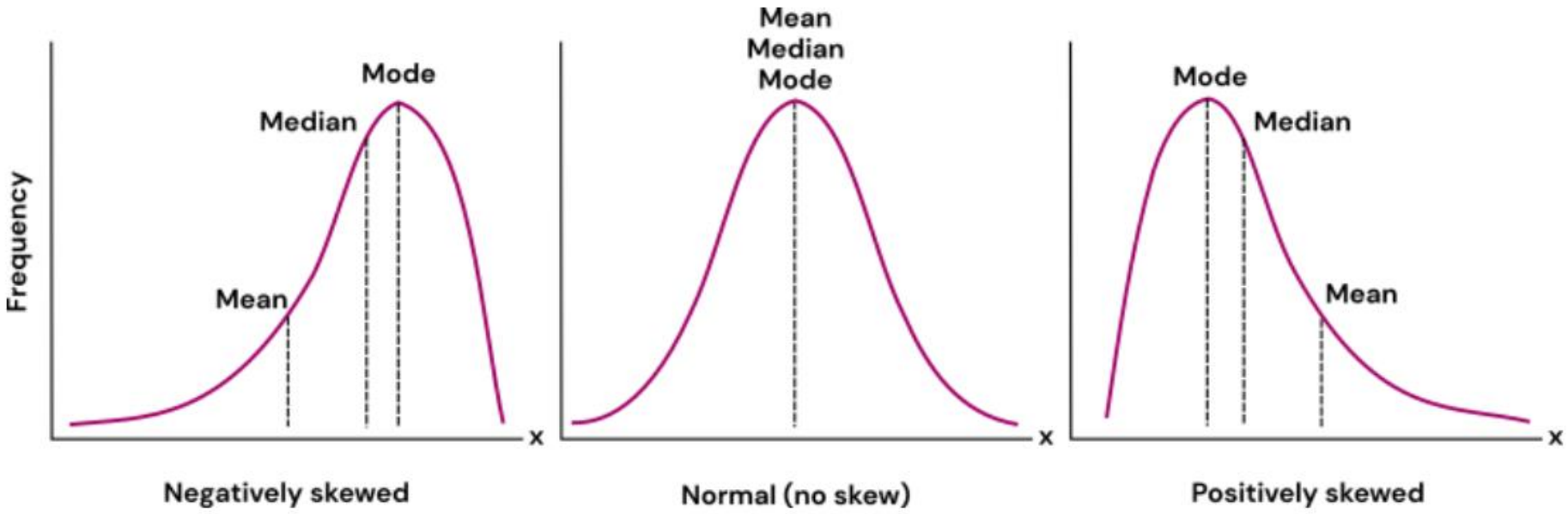
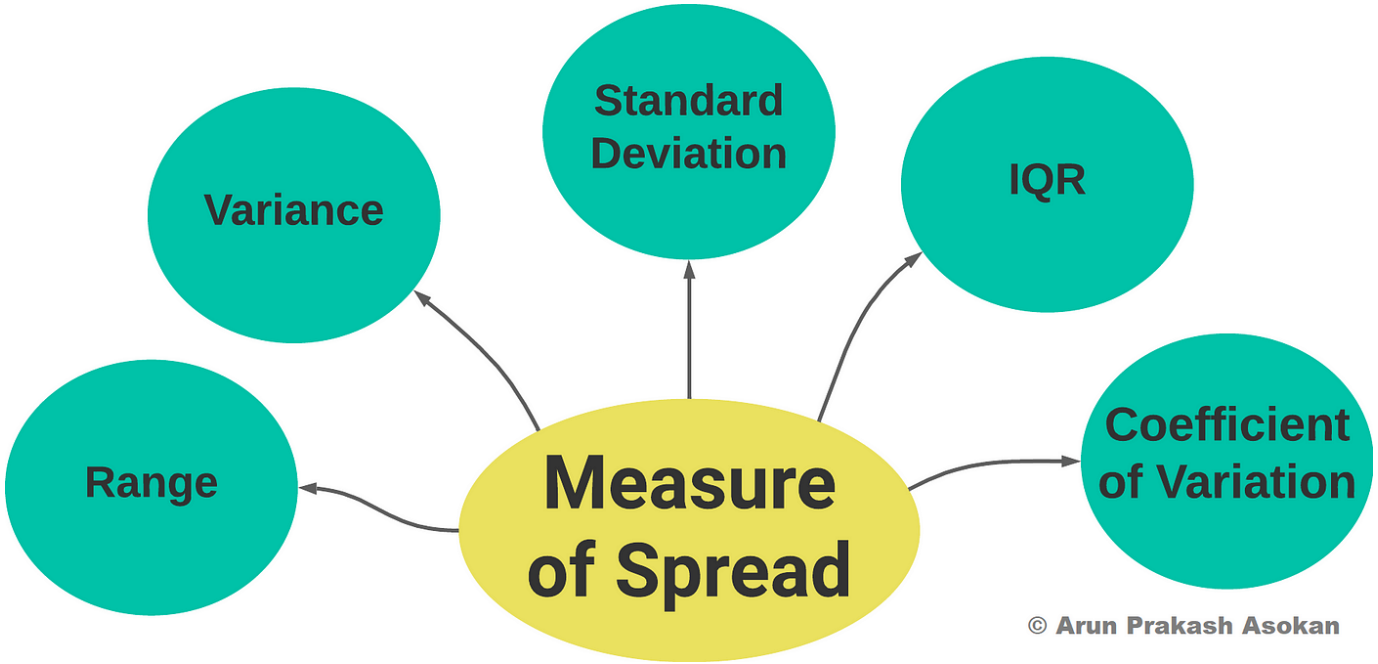
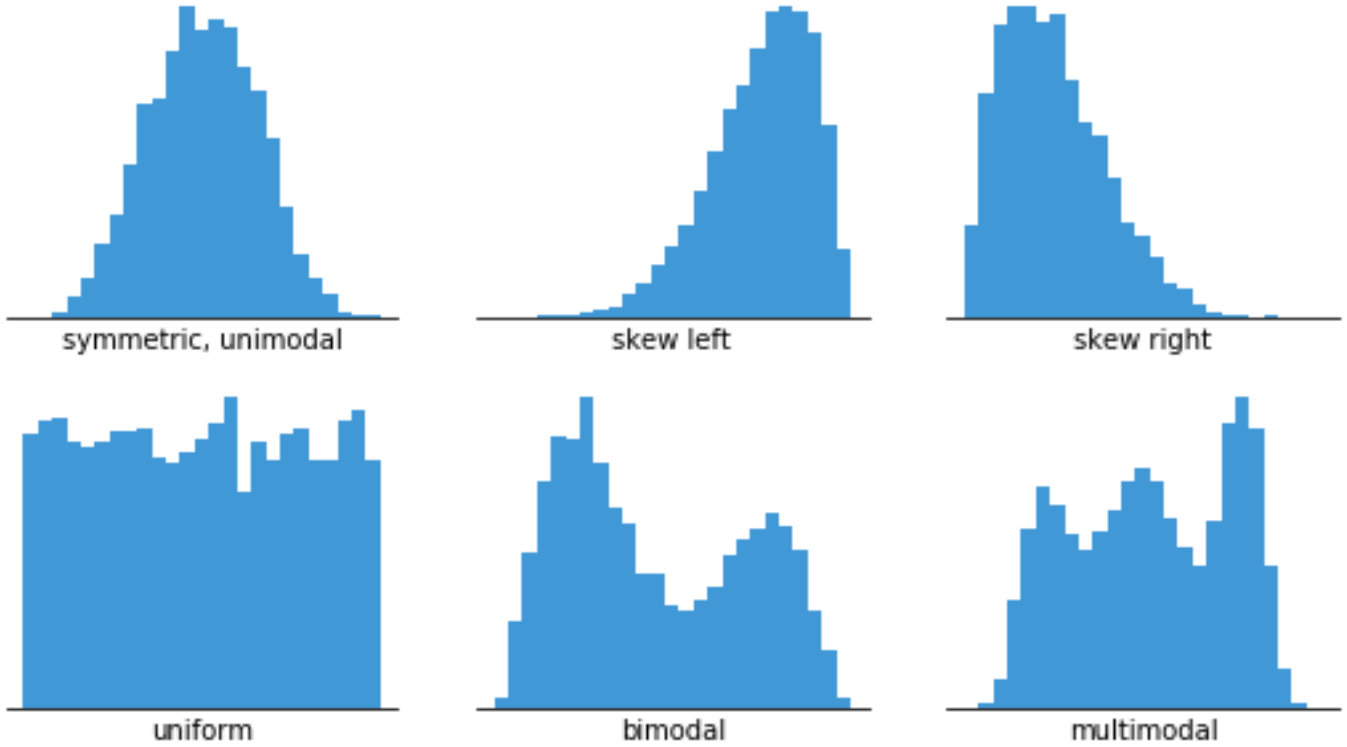
What is a measure of central tendency?



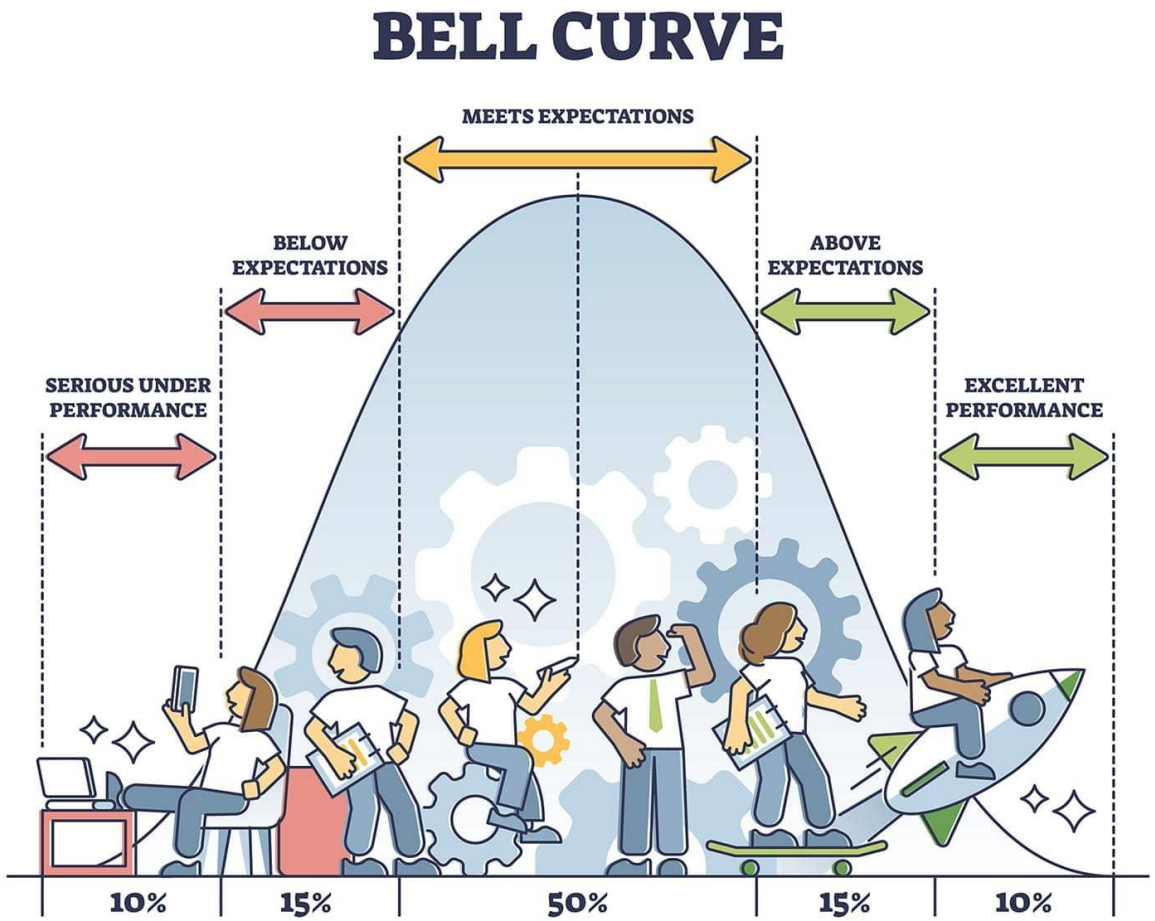
What is a measure of spread?



What is a distribution?



The normal distribution



Let's do some programming

Notebook A:
What is a summary statistic?

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Session B:
Inferential Statistics

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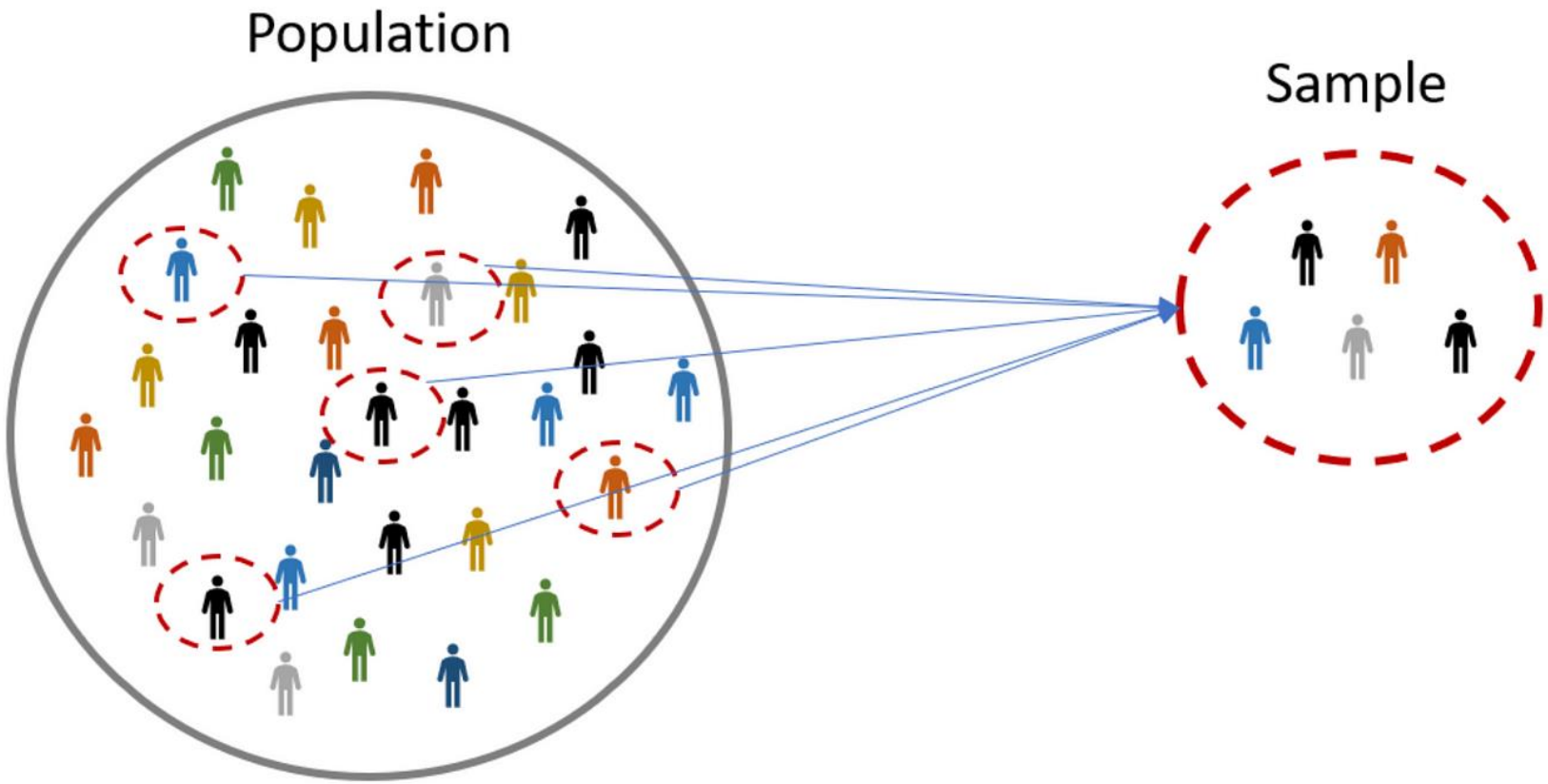
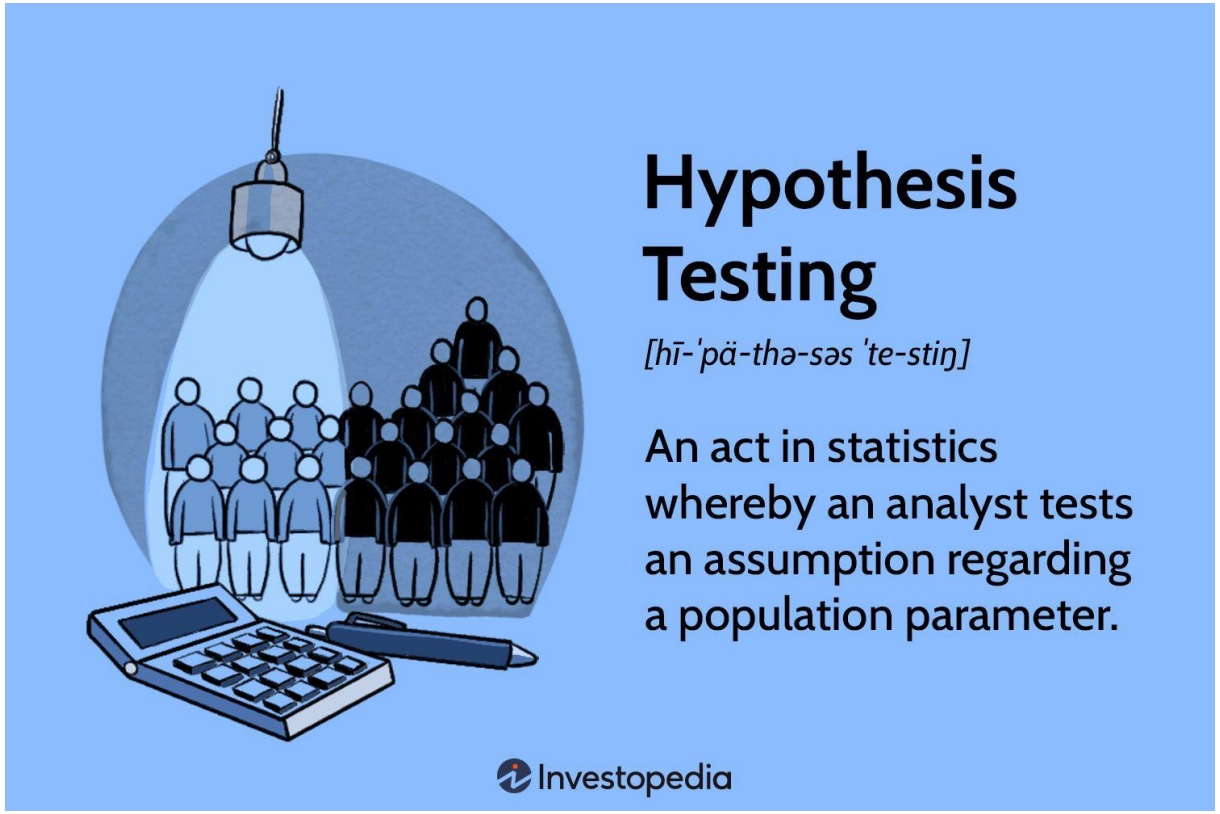

Population
Sample

What is a hypothesis?

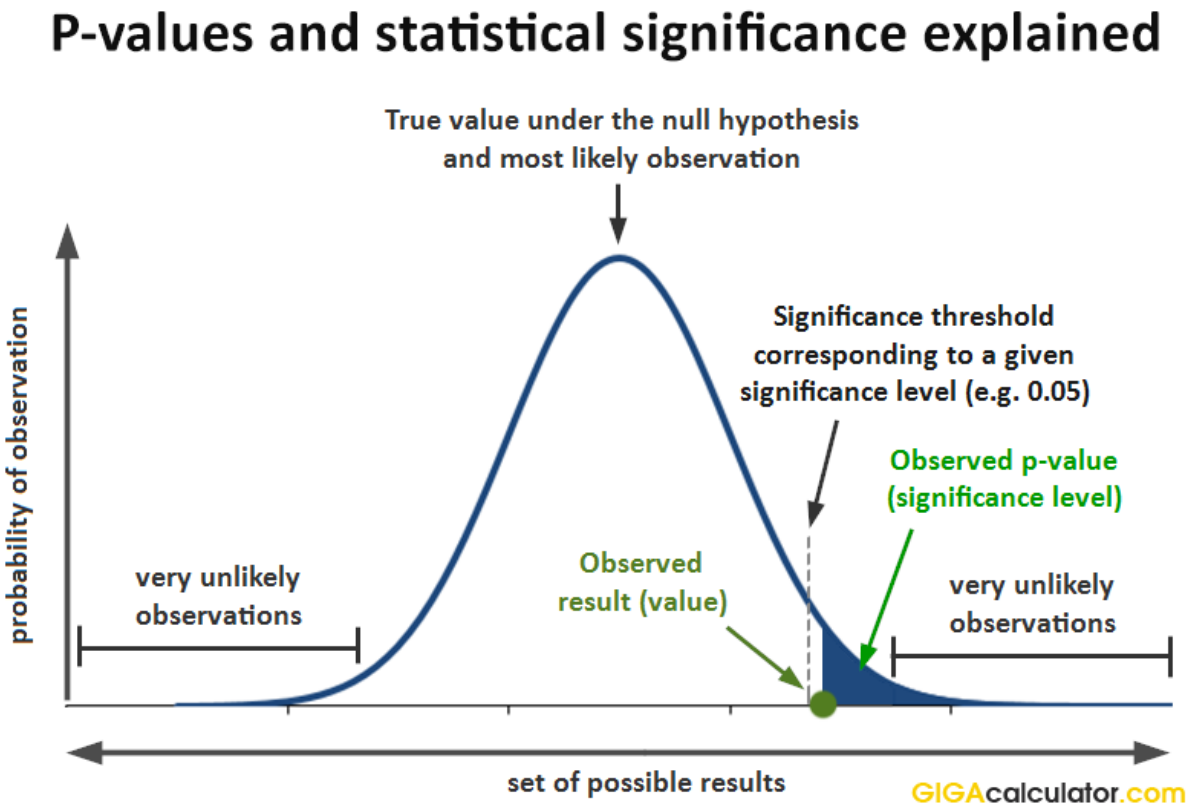


How do I formulate a hypothesis?

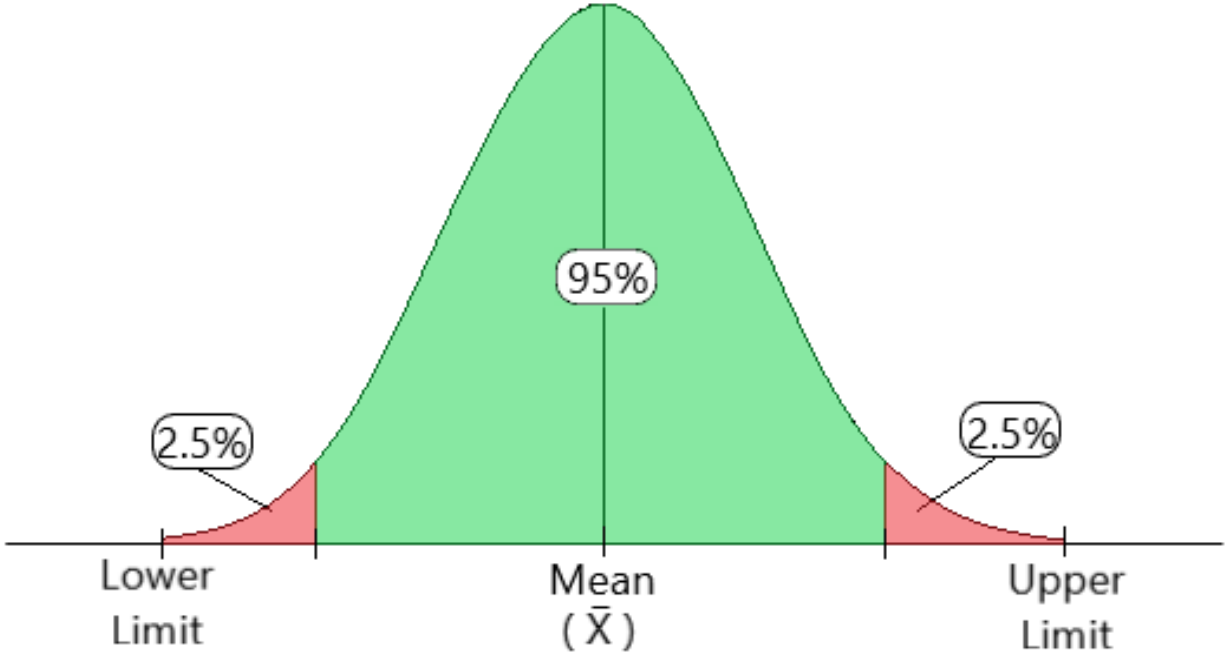
H0: The current status quo is this.

H1: I believe that it is this instead.

What is a p-value?



What is a confidence interval?



Testing a hypothesis.

1. A null and alternative hypothesis,
2. Some assumptions,
3. A test statistic,
4. Some significance threshold (typically 0.95)

BIG STATS POINT

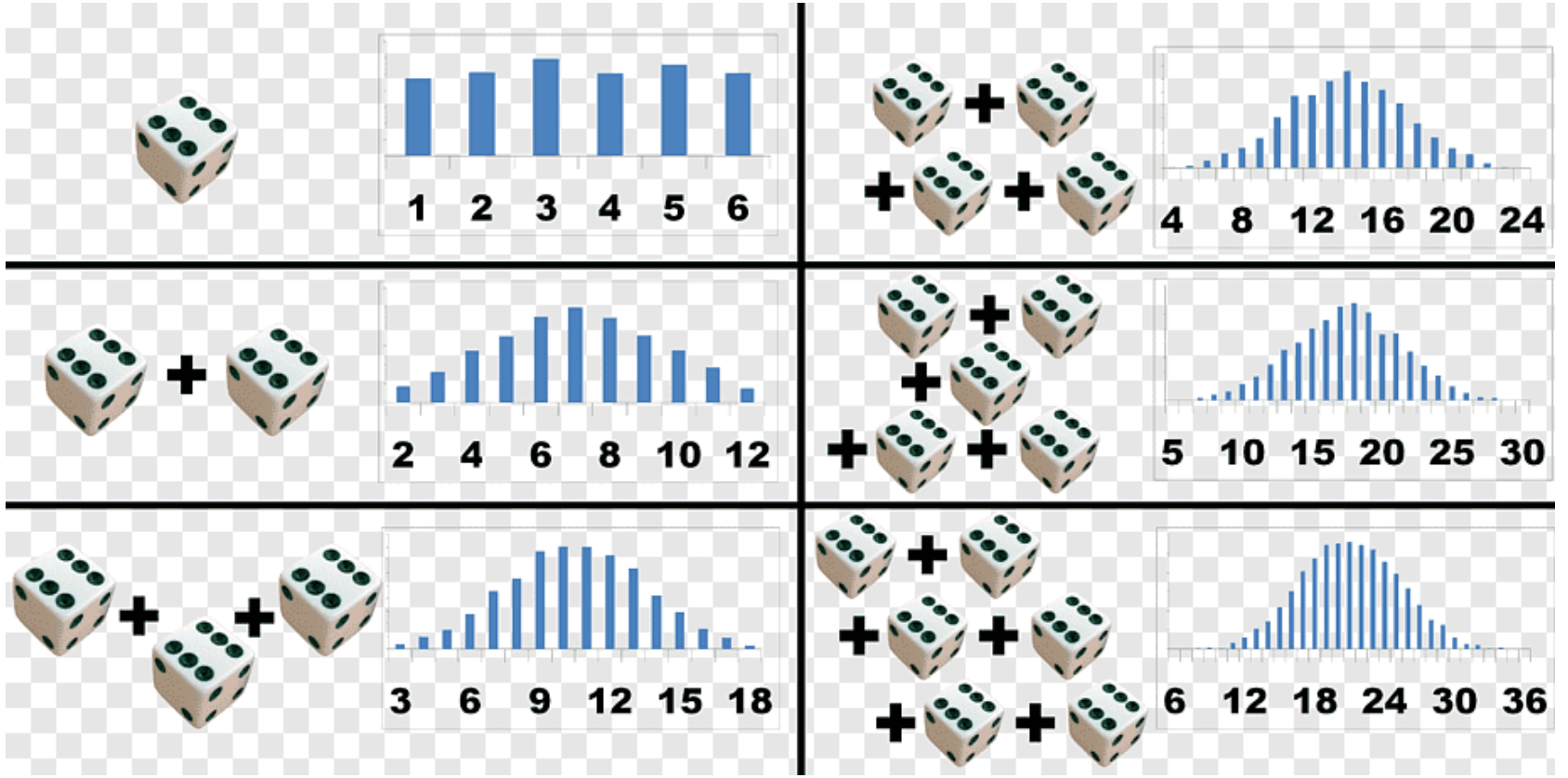
REJECT the *NULL if* *p < 0.05* or NOTHING

A difference in means = Paired T-Testing

H0: My two groups have the same mean.
H1: My two groups of data have a different mean.

Assume: The data are independent and the means of the data are normally distributed

Central Limit Theorem



Central Limit Theorem

When I have a sample size over 30, I can assume that the mean of the data is normally distributed.

Let's do some programming

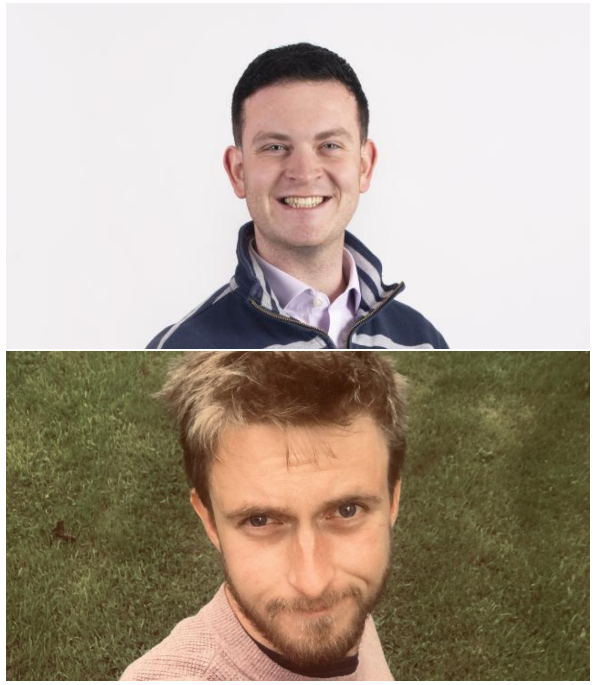
Notebook B:
How do I make inferential statistics?

Feedback for us...

- We hope you've enjoyed the course as much as we did.
- It is really useful for us to hear your feedback

https://forms.office.com/r/YYNrqvuNr8
Should be really quick and only take 5 mins (maximum!)

Thank you from us!



- **Please do check out the other training on the CDCS website. We have lots of different things still on offer this semester!**