



Week 1: Introduction to Statistics

Unit 5: Different Kinds of Analytic Approaches

Different Kinds of Analytic Approaches

Qualitative vs. quantitative data

- The type of analytical approach you take depends on the type of data you have collected and the question you are answering.
- There are two types of data: **qualitative** and **quantitative**.

Qualitative Data

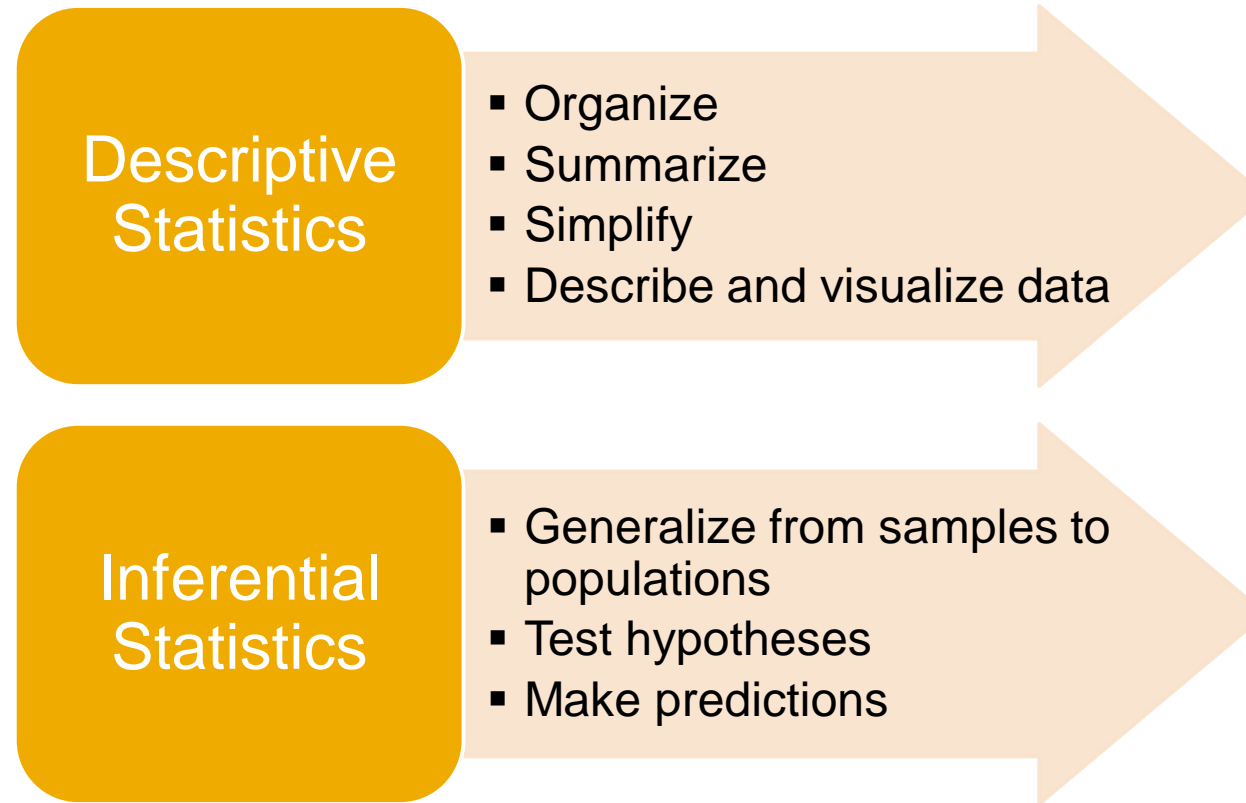
- Qualitative → Quality
- Deals with descriptions
- Data can be observed but not measured
- Colors, textures, smells, tastes, appearance, etc.

Quantitative Data

- Quantitative → Quantity
- Data that can be measured
- Length, height, area, volume, weight, speed, time, temperature, cost, etc.

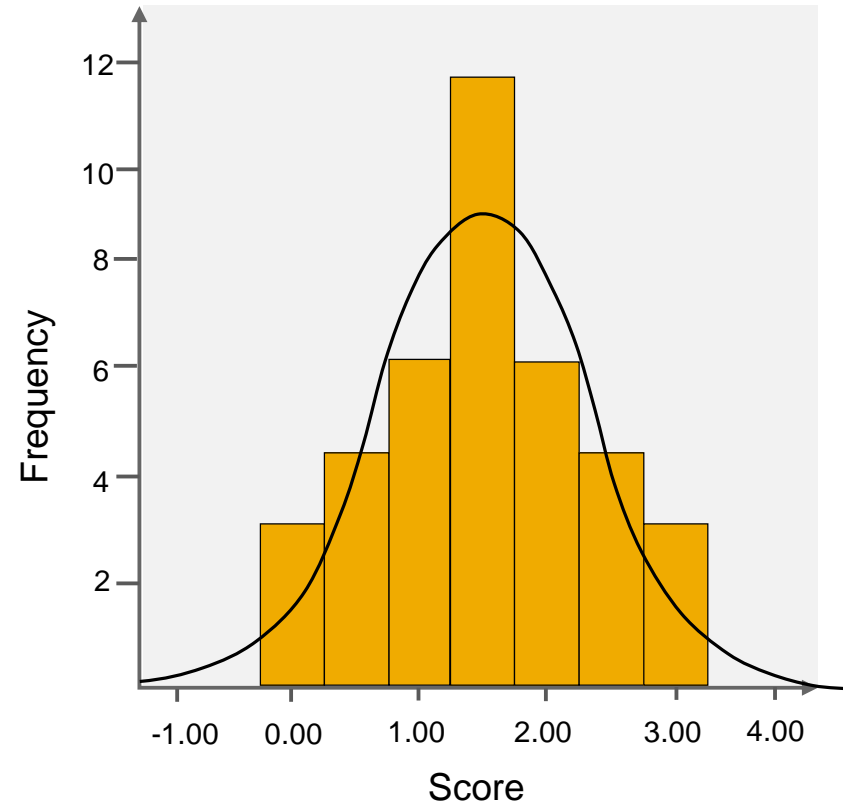
Descriptive vs. inferential analysis

- There are two common types of analysis that are referred to as “descriptive” and “inferential”.

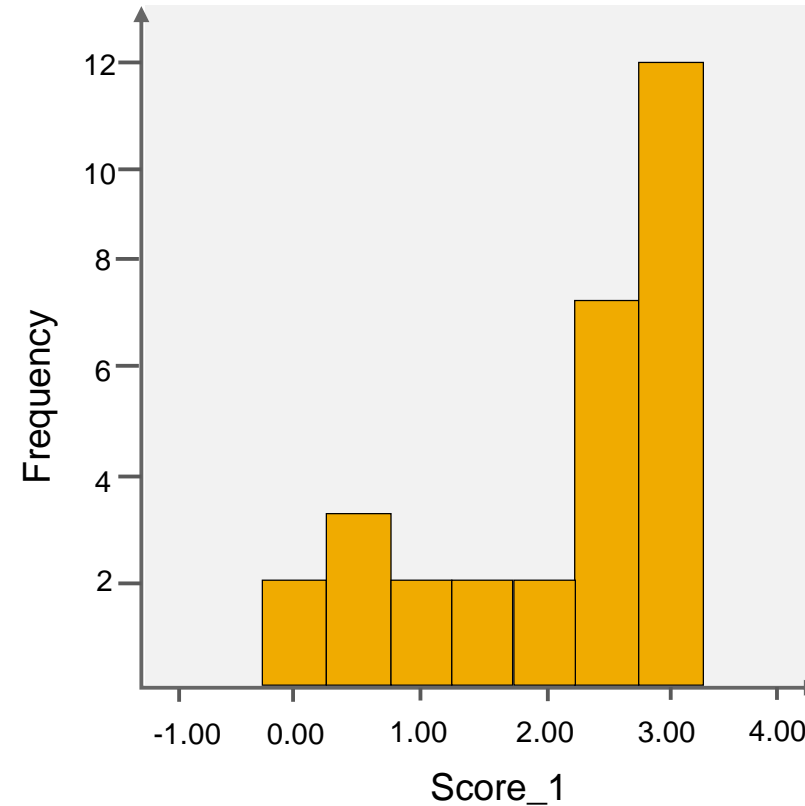


Different Kinds of Analytic Approaches

Normal vs. non-normal



A normal distribution looks like the bell curve



A non-normal distribution

<https://cyfar.org/inferential-analysis> for more information

Common parametric statistical tests

Correlation: Analyze the association between variables	
Pearson correlation	Tests for the strength of the association between two continuous variables
Spearman correlation	Tests for the strength of the association between two ordinal variables (does not assume that data is normally distributed)
Chi-square	Tests for the strength of the association between two categorical variables
Comparison of means: Analyze the difference between the means of variables	
One sample T-test	Compares the mean of a sample to a pre-specified value and tests for a deviation from that value
Paired T-test	Tests for the difference between two related variables
Independent T-test	Tests for the difference between two independent variables
Analysis of Variance (ANOVA)	Tests for the difference between group means in a sample after any other variance in the outcome variable is accounted for
Regression: Analyze how change in one variable predicts change in another variable	
Simple regression	Tests how change in the predictor variable predicts the level of change in the outcome variable
Multiple regression	Tests how change in the combination of two or more predictor variables predicts the level of change in the outcome variable

Some of these tests will be described in more detail later in this course.

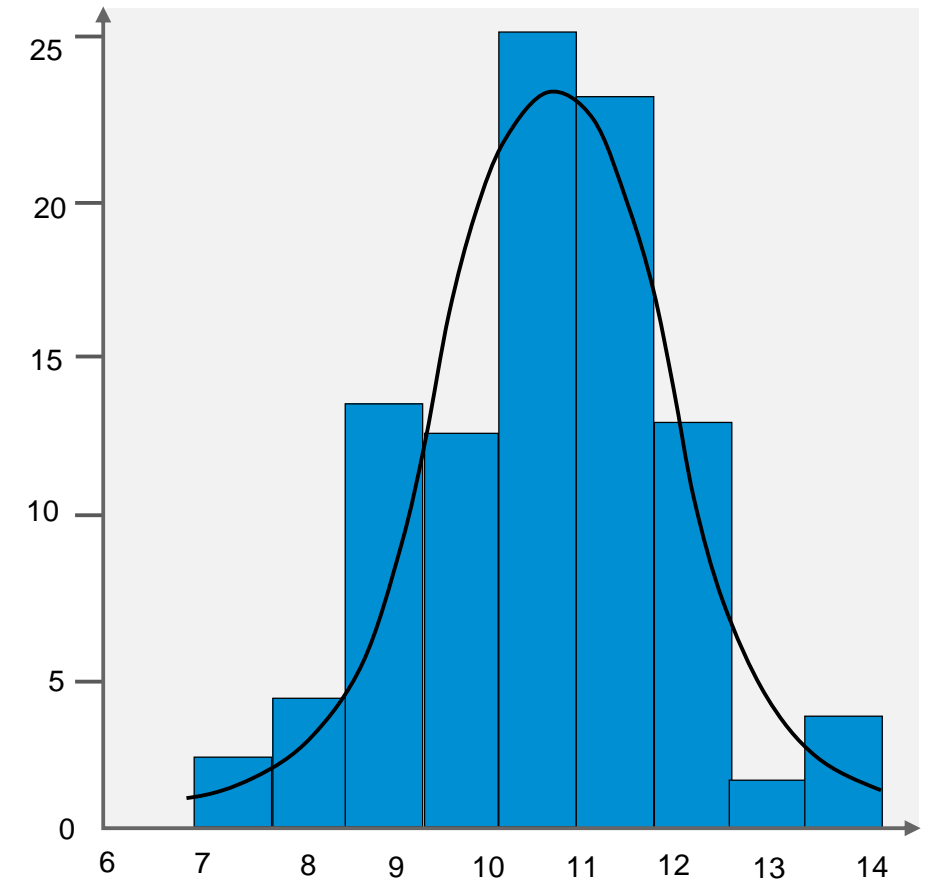
Common nonparametric statistical tests

Nonparametric: used when the data does not meet the assumptions required for parametric tests	
Sign test	Tests if two related variables are different – ignores the magnitude of change, only takes into account direction. The sign is an alternative to one sample T-test or a paired T-test.
Wilcoxon rank-sum test	Tests for the difference between two independent variables – takes into account magnitude and direction of difference
Wilcoxon sign-rank test	Tests for the difference between two related variables – takes into account the magnitude and direction of difference

For more information, see
http://sphweb.bumc.bu.edu/otlt/mph-modules/bs/bs704_nonparametric/BS704_Nonparametric_print.html

Choosing parametric or nonparametric statistical tests

- It can sometimes be difficult to assess whether a continuous outcome follows a normal distribution and whether a parametric or nonparametric test is appropriate.
- The most practical approach to assessing normality involves analyzing the distribution of the outcome in the sample using a histogram.



https://en.wikipedia.org/wiki/Goodness_of_fit for more information

Different Kinds of Analytic Approaches

Summary

- **Descriptive analysis** informs you about the basic qualities of the data.
- **Inferential analysis** uses statistical tests to analyze whether a pattern in the data is due to chance or due to the intervention that is observed, and what the strength of that relationship is.
- In this course, you'll learn about some of these descriptive and inferential statistical techniques, and how these techniques can be misused.



Thank you.

Contact information:

open@sap.com

Follow all of SAP



www.sap.com/contactsap

© 2019 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platforms, directions, and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies.

See www.sap.com/copyright for additional trademark information and notices.