Topics for Stat 101

Overview

Stat 101 is one name for the conventional introductory statistics course. This site contains lessons for teaching topics generally found in Stat 101, but rooting them in real data.

The topics currently in the collection are

1. data and variables *not yet*
2. center and spread
3. proportions *not yet*
4. the t-test
5. the normal distribution
6. linear regression

These *Topics for Stat 101* generally involve computing. We provide the resources for this in the form of mouse-driven, web-based "Little Apps". Using these Little Apps requires an ordinary web browser and nothing more.

Each of the topics contains a number of components:

1. Instructor facing
    - A brief orientation to the statistical method.
    - A description of how the method fits in with statistical practice.
    - The conceptual pitfalls faced by students and instructors and common misconceptions frequently encounted among statistics instructors.
    - A detailed statement of learning objectives written with an eye to assessment of whether those objectives have been met.
    - The background needed by students to undertake each lesson.
    - Tips on using the lesson to create an active classroom. (There's also a set of general tips to foster student engagement and activity)
    - Items that can be used for assessment. (NA)
    - A "pushing the envelope" section to help instructors who want deeper insight into the statistical methods, including a description in which the traditional topics have become obsolete or no longer reflect good statistical practice.
2. Student facing
    - Individual lesson documents illuminating varied aspects of or approaches to the topic. Many of these are best used as in-class, small-group activities, but they can also be used the basis for class lectures. The documents can be customized, extended, or simplified by the instructor.
    - The Little Apps around which most of the lessons have been written, but which are flexible enough to support free exploration of statistical topics either led by the instructor or self-guided by the student.

The Little Apps can be used with or without the lessons. The Apps are designed to use data to present broad statistical concepts, including descriptive statistics, modeling, statistical inference, and hypothesis tests. The interactive format allows students to explore many data sets and many variables within each data set. The data have been selected from published sources and provide many real settings for informative statistical investigation. The Apps allow students to work with multiple variables and generally provide facilities for working with covariates.

Data and variables

Instructor guide Not yet available

Applicable lessons:

1. Point plots. Formats: web : pdf : word : Rmd : edit
2. Variable types. Formats: web : pdf : word : Rmd : edit
3. Variables and the unit of observation Formats: web : pdf : word : Rmd : edit
4. Response and explanatory variablesFormats: web : pdf : word : Rmd : edit

Center and spread

Instructor guide

Applicable lessons:

1. Link to Joe Roith's lesson
2. Summary intervals. Formats: web : pdf : word : Rmd : edit
3. Shapes of distributions. Formats: web : pdf : word : Rmd : edit
4. Standard deviation and the summary interval. Formats: web : pdf : word : Rmd : edit

Proportions *not yet*

Instructor guide

Applicable lessons:

1. Not yet available

Note, will be based on proportions app.

t-test

Instructor guide

Applicable lessons:

1. Comparing two groups. Formats: web : pdf : word : Rmd : edit

2. Comparing confidence intervals. Formats: web : pdf : word : Rmd : edit
3. Two-sample t-test. Formats: web : pdf : word : Rmd : edit

Normal distribution

Instructor guide

Applicable lessons:

1. Normal parameters. Formats: web : pdf : word : Rmd : edit
2. Common and rare. Formats: web : pdf : word : Rmd : edit
3. Distribution shapes. Formats: web : pdf : word : Rmd : edit

Linear regression

Instructor guide

Applicable lessons:

1. Describing linear relationships. Formats: web : pdf : word : Rmd : edit
2. How much variation is accounted for? Formats: web : pdf : word : Rmd : edit

Modeling

Instructor guide not yet available

1. Response and explanatory variables. Formats: web : pdf : word : Rmd : edit
2. How much variation is accounted for. Formats: web : pdf : word : Rmd : edit

Who's who

- Helen Burn
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