

STA261: Exam I Study Guide

Be prepared to see the following material on the exam. Keep the following in mind:

- You should focus more on the usage of the ideas below and being able to write/converse about them, rather than focusing primarily on doing calculations (although you will be responsible for that too).
- The material in the book is relevant, too. Don't just study from your notes alone. A successful exam depends on reading the book, too! Lecture notes alone do not cover everything you'll be expected to do.
- Please remember that the exam will have the included aspect of a time limit, so prepare adequately. Minitab output and formulas will be provided when needed on the exam.

Chapter 1: Basics and overview (all)

- Statistics as the process of learning about how the world operates in the presence of variation and uncertainty by collecting and making sense of data
- Three facets of statistics: producing data, describing data with descriptive statistics, inferential statistics

Chapter 2: Description of samples and populations (all section except 2.7)

- Samples and statistics; populations and parameters
- Variables (categorical, continuous) and measurement scales (nominal, ordinal, continuous)
- Frequency distributions, relative frequency distributions
- Visual displays: histograms, dotplots, stem and leaf displays, boxplots, modified boxplots; when to use various displays (i.e. how to choose a method of displaying a certain data set)
- Distributional shape: symmetry, skew, modes, outliers
- Measures of center: sample mean, sample median; resistance of the median
- Measures of variation (dispersion): range, IQR, SD, CV; resistance of IQR
- Empirical Rule for roughly symmetric unimodal distributions
- Goal in sampling: an unbiased representation of a target population

Chapter 3: Random Sampling and Probability (sections 3.1-3.4)

- What is a simple random sample? (definition)
- How to achieve randomness in sample selection: methods (table of random numbers, random number generators); how bias may appear in sampling (think of examples....sometimes it can creep in in subtle ways)
- Probability (definition). Chance operations and events. Frequency interpretation of $P\{E\}$.
- Probability trees for events that are comprised of a chain of component 'subevents'.
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