STAT 252 Winter 2017

Exam 1 Preparation

Logistics:
- Tues Jan 31
  - 50 minutes
- Open-notes, open-book
  - You may bring anything that I have provided or that you produce yourself
- Bring calculator, normal probability table, \( t \)-table
  - No computer use
- Handouts 1 – 8, Quizzes 1 – 8, Investigations 1 – 5, Chapters 13, 14.5

Outline:
- Review of fundamental ideas
  - Observational units, variables, types of variables
  - Population, sample; parameter, statistic
  - One-sample confidence intervals, hypothesis tests
    - \( z \)-test, \( z \)-interval for population proportion
    - \( t \)-test, \( t \)-interval for population mean
- Studies and conclusions
  - Sampling bias, random sampling, generalizability
  - Observational study, explanatory variable, response variable
  - Association, confounding variable
  - Experiment, random assignment, cause/effect conclusion
- Statistical significance
  - Null model/hypothesis, null distribution
  - Simulation analysis, approximate p-value, strength of evidence
  - Binomial (exact) test
- Comparing two proportions
  - Conditional proportions, segmented bar graph
  - Simulating randomization test, approximate p-value
  - Two-proportion \( z \)-test, \( z \)-interval
  - Test statistic, significance level, test decision
  - Impact of difference in proportions, sample sizes, confidence level
  - Consistency between tests and intervals
  - Simpson’s paradox
- Comparing two means
  - Two-sample \( t \)-test, two-sample \( t \)-interval
  - Statistical significance vs. practical importance
  - Matched pairs design, paired \( t \)-test, \( t \)-interval, sign test
Resources available online:
- This preparation sheet
- Handouts
- Quizzes and solutions
- Investigation assignments and solutions
- Practice exam and solutions

Types of questions to expect:
- Short answer
- Calculations
- Interpretations and explanations
- Similar to examples, quizzes, investigations, practice exam

Advice for preparing:
- Prepare and organize your notes carefully
- Don’t study less because it’s open-notes/book
- Plan not to rely on your notes/book too much
- Re-read, work through handouts
- Focus on understanding, not memorization
- Review and make sure that you can answer example, quiz, HW, practice exam questions
- Ask questions during class, office hours

Advice during the exam:
- Show up on time!
- Be cognizant of time constraint
- Read carefully
- Relate conclusions to context
- Write and explain clearly
- Show details of calculations
- Do not elaborate excessively