Math 58B - Exam 2 Preparation - Spring 2018

Logistics:

• Monday, April 16

• Take home problem due Friday, April 20in class

• Two-sides of notes are allowed

• Bring calculator

• No computer use

• Material up through Wednesday, April 11

• Chapter 3 (Inv 3.1 – 3.10); Chapter 4 (Inv 4.1 – 4.6)

Overview:

We have analyzed two new types of studies:

1. those that involve two (binary) categorical variables, for which the results can be organized in a 2×2 table.

2. those where the response variable was quantitative (and we had two samples). We have studied graphical and numerical summaries for such data. We have again used inference methods based on simulation/randomization and also approximate methods based on the t-distribution.

We have studied how to conduct inferences depending on whether the data were collected from:

• Independent random samples

• One random sample with two variables

• Randomized experiment

• Observational study

We have also considered how the scope of conclusions to be drawn depends on how the data were collected. More specifically:

• Random assignment allows for the possibility of drawing cause/effect conclusions.

• Random sampling allows for generalizing to a larger population.

We have examined confidence intervals for different parameters:

• Difference in population success proportions

• Population relative risk, population odds ratio

• Differences in population means from independent samples

Outline:

• Simulating randomization test for comparing two groups with binary response

• Two sample z-test for differences in proportions

• Two sample z-interval for differences in proportions

• Fisher’s Exact Test

• Relative risk: interpretation, testing, and confidence intervals

• Odds Ratio: interpretation, testing, and confidence intervals

• Dotplot, histogram, boxplot; center, variability, shape, symmetric, skewed, outliers

• Mean, median, standard deviation, inter-quartile range; resistance

• Sampling distribution of differences of sample means, Central Limit Theorem for Sample Mean, standard error of sample mean

• Simulating randomization test for comparing two groups with quantitative response

• Approximate and exact randomization distribution, approximate and exact p-value

• Two-sample t-test for comparing means

• Two-sample t-interval for difference in population means

• Effects of within-group variability, sample size, difference in group means

Advice:

• Organize notes for efficient retrieval of information/formulas

• Don’t plan to use notes too much

* Prepare as if exam were closed book/notes
* Focus on understanding, not memorization
* Be cognizant of time constraint

• Expect similar questions to what we answer in class every day, clicker Q, HW, exam 1

• Be ready to interpret computer output

* Possibly exclude irrelevant output

• Be prepared to think/explain/interpret

* Do not just plug into formulas
* Be ready to explain process of how you would do calculations

• Read carefully

* Be sure to answer the question asked

• Take advantage of information provided

* Perhaps including output

• Relate conclusions to context

• Practice

* Work through solved examples at end of text chapters
* Re-work in-class investigations, examples
* Re-work HW questions
* Re-work clicker questions (posted online)
* Re-work previous exam questions
* Re-read summary sections

• Show up on time!

* Be cognizant of time constraints
* Make an attempt at all questions