

The second exam will be in class on Friday, November 13th. Just as before, you will not be allowed to use any calculators, books, or notes. You will be given a formula sheet as well as tables for the Normal, Student, and Chi-Square distributions. The formula sheet you get for the test will contain the information on the attached formula sheet, but not necessarily in the same order. Answers given on the exam can be left as unsimplified formulas *when appropriate*.

Questions on the exam will cover material from chapters 6-8 of the book, as well as some topics in class that are not in the book. To do well on the exam, you should know the topics and be able to do the types of problems from the homework/in class, as well as feel comfortable with the formulas and tables.

Topics

Chapter 6

1. What is meant by a continuous distribution?
2. Understand the correspondence between area and probability, and be able to do so in the uniform distribution.
3. How does one find probabilities in the a normal distribution?
4. What is meant by a critical value?
5. What is meant by a sampling distribution?
6. What is meant by bias and unbiased estimators, and what are important examples of each?
7. What is the central limit theorem?
8. When and how does one use the central limit theorem?
9. How can one reasonably conclude that data is normally distributed?
10. How does one interpret a Normal Quantile Plot?
11. How and when can we approximate a binomial distribution by a normal distribution?

Chapter 7

1. What is a point estimate?
2. What is the proper interpretation of a $1 - \alpha$ confidence interval?
3. What is a margin of error?
4. What are the number of degrees of freedom?
5. When constructing confidence intervals, when do you use Normal, Student, or Chi-Square, and how do you use them?
6. What are the requirements to estimate parameters using confidence intervals?
7. How do you construct CIs for proportions, means, variances, and standard deviations.

Chapter 8

1. What is meant by Null and Alternative Hypothesis, and what symbols do we associate with them?
2. What the significance level α , and what are some common alphas to use?
3. What is a test statistic, and what are they in particular cases?
4. What is the critical region? When are our critical regions one-tailed/two-tailed?
5. What is the P-value?
6. What are Type I and Type II errors? How do we denote the probability of each?
What are confidence and power?
7. What are the requirements to test our hypothesis via test statistics?
8. When do we reject a hypothesis using critical values?
9. When do we reject a hypothesis using P-values?

10. When do we reject a hypothesis using confidence intervals?
11. When are our methods equivalent?
12. What is the exact method for testing a claim about a proportion, and what are the requirements?

The class prior to the exam (Tuesday, November 10th) has been set aside to be for review and questions. There is most likely not enough time to review everything listed above, so you should come to class already having looked at this list and ready to ask specifics. Wednesday is Veterans day, and as such there is no class or regular office hours then. Regular Thursday office hours will occur.

Since this is a test week, there will be no homework assigned for the following Tuesday (November 10th). Homework 9 will be assigned the next week and will be on material covered after the exam and the following week. It will be due the following Tuesday (November 24th).

Formula Sheet

Chapter 6

- $z = \frac{x - \mu}{\sigma}$
- $\mu_{\bar{x}} = \mu$
- $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$
- $z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$
- $\sqrt{\frac{N-n}{n-1}}$

Chapter 7

- $E = z_{\alpha/2} \sqrt{\frac{\hat{p}\hat{q}}{n}}$
- $n = \frac{[z_{\alpha/2}]^2 \hat{p}\hat{q}}{E^2}$
- $n = \frac{[z_{\alpha/2}]^2 (0.25)}{E^2}$
- $E = z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$
- $n = \left(\frac{z_{\alpha/2} \sigma}{E} \right)^2$
- $t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$
- $E = t_{\alpha/2} \frac{s}{\sqrt{n}}$
- $\chi^2 = \frac{(n-1)s^2}{\sigma^2}$

Chapter 8

- $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}}$
- $z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}}$
- $t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$
- $\chi^2 = \frac{(n-1)s^2}{\sigma^2}$