

Stat 221 Introduction to Probability and Statistics Fall 2008

Exam 3 Preparation

- Logistical details
 - Friday, November 21
 - 50 minutes
 - Open-book, open-notes
 - Need to bring calculator, z -, t -tables
- Coverage
 - Topics 16-23
 - Notes from days 31-41
 - Quizzes 17-24
 - Investigations 6-8
- Resources available online
 - This preparation sheet
 - Day-by-day notes, handouts
 - Quiz solutions
 - Investigation solutions
 - Optional assignments, solutions (via Blackboard)
- Types of questions to expect
 - Short answer (e.g., identifying which procedure to use, stating a test decision)
 - Calculations (e.g., confidence intervals, test statistics)
 - Interpretations and explanations (e.g., interpreting confidence interval, explaining how conclusion follows from significance test)
 - Possibly of computer output
 - Similar to exams 1 and 2, in-class examples, quizzes, investigations, optional assignments
- 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 the day-by-day notes
 - Re-read highlighted passages, watch-out, wrap-up sections of book
 - Focus on understanding, not memorization
 - Don't forget about fundamental ideas from earlier in course
 - Review and make sure that you can answer the quiz, investigation, optional assignment questions
 - Ask questions during review class session (Thur), office hours (Wed 2-4, Thur 1-2)
- Advice during the exam
 - Show up on time!
 - Be cognizant of time constraint
 - Read carefully
 - Relate conclusions to context
 - Write and explain clearly

- Do not elaborate excessively
- Show details of calculations
- Take advantage of partial information

Outline (of most important topics since exam 2)

- Confidence intervals
 - General ideas
 - Form: point estimate \pm (critical value) \times (standard error)
 - Interpretations: of confidence interval, of confidence level
 - Effects of sample size, confidence level
 - On midpoint, margin-of-error
 - Effects of sample proportion, sample variability, sample mean
 - For population proportion π : $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ (Topic 16)
 - Technical conditions
 - Sample size determination
 - For population mean μ : $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$ (Topic 19)
 - Degrees of freedom
 - Technical conditions
 - Not prediction intervals
- Tests of significance
 - Structure, reasoning, interpretation
 - Null hypothesis
 - Claim about parameter(s)
 - No difference, no effect
 - Alternative hypothesis
 - One-sided vs. two-sided
 - Test statistic: measure of how far sample value falls from hypothesized value
 - p-value
 - Interpretation: probability of obtaining such an extreme sample if null hypothesis were true
 - Smaller p-values provide stronger evidence against null hypothesis
 - Significance level α
 - Test decision
 - Technical conditions
 - z-test for population proportion π (Topic 17)
 - t-test for population mean μ (Topic 20)
- More inference considerations (Topic 18)
 - Relationship between tests and intervals
 - Statistical vs. practical significance
 - Tests concern statistical significance
 - Intervals address practical significance

- Importance of randomness
- Type I, II errors
- Inference for comparing two groups
 - z -test, z -interval for comparing proportions between two groups (Topic 21)
 - Interpretation, conclusions
 - Effect of sample size
 - t -test, t -interval for comparing means between two groups (Topic 22)
 - Independent samples, random assignment
 - Interpretation, conclusions
 - Effect of difference in sample means, sample variability, sample sizes
 - Paired t -test, t -interval (Topic 23)
 - Recognizing paired design
 - One-sample t -procedure on differences