

Stat 217 – Exam 2 Preparation

- Logistical details
 - Thursday, February 28
 - 110 minutes
 - Open-book, open-notes
 - Calculator, z -, t -tables needed
- Coverage
 - Topics 11-20
 - Notes from days 9-15
 - Quizzes 11-19
- Resources available online
 - This preparation sheet
 - Day-by-day notes
 - Quizzes and solutions
 - Optional assignments, solutions (via Blackboard)
- Types of questions to expect
 - Short answer
 - Calculations
 - Interpretations and explanations
 - Possibly of Minitab output
 - Possibly including irrelevant output
 - Similar to in-class examples, quizzes, optional assignments, previous 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 the day-by-day notes
 - Re-read highlighted passages, watch-out, wrap-up sections of book
 - Focus on understanding, not memorization
 - Review and make sure that you can answer the quiz, optional assignment questions
 - Ask questions during office hours (Tues, Thur 3-4pm in our classroom; Wed 10-11am in my office 25-102)
- 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)

- Probability
 - Interpretation: long-term relative frequency
 - Approximation through simulation
 - Calculations
 - Sample space
 - Equal likeliness
 - Expected value
 - Interpretation: long-run average value
 - Approximation through simulation
 - Calculation from probability distribution
- Normal distributions
 - Normal curves
 - Effects of mean μ , std dev σ
 - Standard normal curve (mean 0, std dev 1)
 - Calculations
 - Standardization, z-scores
 - Normal probability table
 - Normal percentiles (reading table “in reverse”)
- Sampling distributions
 - Parameter, statistic
 - Sampling variability
 - Effect of sample size
 - Central Limit Theorem (CLT) for sample proportion
 - Technical conditions
 - Effect of sample size
 - Applications
 - Central Limit Theorem (CLT) for sample mean
 - Technical conditions
 - Effect of sample size
 - Applications
- 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 : $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$
 - Technical conditions
 - Sample size determination
 - For population mean μ : $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$
 - Degrees of freedom
 - Technical conditions

- Not prediction interval
- 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
 - t-test for population mean μ
- More inference considerations
 - Relationship between tests and intervals
 - Statistical vs. practical significance
 - Tests concern statistical significance
 - Intervals address practical significance
 - Non-sacredness of conventional α levels
 - Importance of randomness