

STAT 301 Exam 1 Preparation Fall 2009

Logistics:

- Wed Oct 14 from 2:10-4pm
- Open-book, open-notes
- Bring calculator
- Some computer use (Minitab, applets)
- Material from Wed Sept 23 – Wed Oct 7, HW1-9

Overview:

We have analyzed studies that involve one binary categorical (i.e., yes/no) variable, where the data are a sample (ideally, a random sample) from a population or process.

We have studied two primary types of statistical inference:

- Statistical significance, where the goal is to assess the degree to which the sample data provide evidence supporting a research conjecture;
- Statistical confidence, where the goal is to estimate a population parameter with an interval of plausible values.

We have studied three ways to conduct statistical inference in this situation:

- Simulation
 - Tactile (e.g., with cards)
 - Technology (e.g., with applet)
- Binomial probability distribution
 - By hand
 - With Minitab
- Normal distribution
 - When CLT conditions are satisfied
 - With Minitab

Outline:

- Reasoning process of statistical significance; null model, simulation, p-value, binomial probabilities
- Null hypothesis, alternative hypothesis, two-sided p-value, significance level
- Observational unit, variable, population, sample, parameter, statistic, confidence interval
- Rejection region, type I error, type II error, power
- Normal probability curve/model, standard normal distribution, z-score
- Sampling variability, sampling distribution, Central Limit Theorem (CLT) for sample proportion
- Test statistic, test of significance structure
- Standard error, normal-based CI for popn proportion, critical value z^*
- Interpretation of confidence level, adjusted Wald procedure
- Practical vs. statistical significance, sample size determination, biased sampling method, simple random sampling
- Connections among simulation-, binomial-, and normal-based inference

Advice:

- Organize notes for efficient retrieval of information/formulas
- Don't plan to use text, notes too much
 - Prepare as if exam were closed book/notes
 - Focus on understanding, not memorization
 - Be cognizant of time constraint
- Be prepared to think/explain/interpret
 - Do not just plug into formulas
 - Be ready to explain process of how you would do calculations
- Take advantage of information provided
 - Perhaps including Minitab output
- Relate conclusions to context
- Re-work in-class examples
- Re-work HW questions