

GENERAL NOTES

- Prepare your notes sheet: 8.5”x11”, both sides
- Test is multiple choice and essay
 - 40 multiple choice questions (graded on your best 30)
 - Several answer choices may seem good, but only one is best
 - 3-6 data analysis questions
 - Be clear. Use complete sentences.

FINAL EXAM REVIEW OUTLINE

1. Be prepared to use data in all forms
 - a. Summarized data
 - b. Data from a worksheet online
 - c. Data that you need to enter into a worksheet

2. From Exam 1
 - a. Categorical Data
 - i. Bar chart
 1. Choice of ordering the categories – doesn’t matter
 - ii. Compare with side-by-side charts
 - b. Quantitative Data
 - i. Histograms and Boxplots
 - ii. Shape of distribution – mode, form, unusual features
 1. Symmetric, uniform, skew
 - iii. Basic descriptive statistics (mean, sd, 5 number summary, iqr)
 1. Larger vs. Smaller variation
 - iv. Compare distributions using any of the above
 1. Focus on trends, not extreme values
 - v. Normal model
 - c. Relationships in Quantitative Data
 - i. Make picture – scatterplot (explanatory = X, response = Y)
 - ii. Describe – direction, form, strength
 - iii. Correlation to measure strength (if linear)
 - iv. Regression to model linear –
 1. predictions
 2. Interpret/Find: slope, intercept, R^2
 3. Residuals and Residual plot
 - v. Outliers, influence, leverage
 - vi. Association is not causation

3. From Exam 2
 - a. Gathering Data
 - i. Concept behind: Generate random numbers
 - ii. Surveys and bias
 1. Population vs. Sample

- iii. Observational studies
 - iv. Experiments – The 4 Principles, Why Randomize?
 - 1. Causal relationship possible
 - b. Probability
 - i. Law of Large Numbers/Empirical Probability
 - c. Sampling Distributions
 - i. Mean, Standard Deviation, Standard Error
 - ii. Sample proportion
 - iii. Sample mean
 - iv. Central Limit Theorem
- 4. From Exam 3
 - a. Hypothesis Tests
 - i. Focus on concept over calculation
 - ii. 1 proportion, 1 mean, 2 independent means
 - iii. Steps of a Test
 - 1. Find null/alternative hypotheses, name the test
 - 2. Check conditions, determine/draw the model
 - 3. Find p-value/test statistic
 - 4. Form conclusions (both statistical and experimental)
 - iv. Provide interpretations for p-value, test statistic, type I error, type II error (in the context of the problem)
 - 1. Determine which error is better/worse
 - v. “Fail to Reject H_0 ” vs. “Accept H_0 ” – Limitations of the Test
 - b. Confidence Intervals - Construct and Interpret
 - i. 1 proportion, 1 mean, 2 independent means

WHAT TO STUDY

- Rework/Review Concepts on Exams 1 and 3
- Briefly review ‘big ideas’ from Exam 2
- Practice Data Analysis with Project #3
- Make Your Notes Sheet