

Stat516 Final Exam Study Guide

1. Pdf of $\text{Min}\{Y_1, \dots, Y_n\}$ and that of $\text{Max}\{Y_1, \dots, Y_n\}$.
2. Unbiased estimator
3. Relative efficient of two consistent estimators
4. Comparing biased estimators using MSE
5. Sufficient statistic, Factorization theorem
6. Conditional expectation
7. Rao-Blackwell theorem (no need to really work out)
8. Methods of estimation: method of moments, MLE
9. Definitions of chi-square rv, t-distribution rv, F distribution rv
10. Confidence intervals: one sample mean, difference of two sample means, and those for proportions
11. Setting up H_0 and H_a
12. Test statistic, rejection region, P-value
13. Type I error and Type II error, significance level, power of a test, power function (no computation but knowing their meaning)
14. Practical implications of making Type I or Type II error
15. Large sample hypothesis testing for one mean, one proportion, two means, two proportion
16. Small sample one sample t test, paired design t-test, and two sample t-test when variances are equal
17. Testing equality of two variances (the 3-law)
18. Know the names of the following special statistical procedures designed for (i) Predicting one variable using other variables: *Regression Analysis*; (ii) Comparing three or more means: *Analysis of Variances*; (iii) Comparing three or more proportions: *Chi-squared Test*; (iv) Testing for independence of two variables: *Chi-squared Test*; (v) Time-related data: *Time-series Analysis*; (vi) System life time: *Reliability (Survival-ship) Analysis*