Prelim 2 Review

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Methods of Evaluating Estimators

- Mean squared error: MSE equals estimator variance plus estimator squared bias.
- Best Unbiased Estimators (UMVUE) (Definition 7.3.7)
- **Cramér-Rao Lower Bound** (Theorem 7.3.9)
- Score Function and Fisher Information (one parameter/multiple parameters), exponential family. (Lemma 7.3.11)
- Attainment of CRLB (Corollary 7.3.15), exponential family.
- Construct UMVUE through complete statistics.
- Complete/Sufficiency and UMVUE: Rao-Blackwell theorem (Theorem 7.3.17 and Theorem 7.3.23)

Loss Function Optimality

- Loss function
- Risk function
- Bayesian risk function
- Bayes rule (Different loss functions will lead to different Bayes rules.)

Hypothesis testing

- H_0 and H_1
- Likelihood ratio test
- Power function
- Type I, II error
- Size/Level of a test
- p-value
- Critical value for a given size α/Sample Size Calculation
- Unbiased test