STAT 291 - Statistics for the Mathematical Sciences I

Review Sheet for Exam I

Chapter 1

- Definition of Statistics

- Population and Sample

- Census

- Variables, Univariate, Bivariate, Multivariate

- Descriptive vs. Inferential Statistics

- The role of Probability

- Parameter and Statistic

- Sampling methods:

  - Random Sample
  - Simple Random Sample (SRS)
  - Systematic Sampling
  - Stratified Sampling
  - Cluster Sampling
  - Convenience Sampling

- Stem-and-Leaf display

- Dotplot

- Histogram

  - Frequency tables
  - Skewness vs. symmetry

- Measures of center:

  - Mean
  - Median
  - Mode

- Measures of variation

  - Range
  - Variance and standard deviation
  - IQR

- Percentiles (and special cases: Quartiles)

- Boxplot

Chapter 2

- Probability
- Event
- Simple and Compound events
- Sample Space
- Notation: $P(A)$
- Complement: A'
- Union and Intersection
- Mutually Exclusive/Disjoint
- Venn Diagram
- Axioms
- Rules for assigning and interpreting probabilities:
    - Relative frequency approach
    - Subjective Approach
- Addition Rule
- Systematically Determining Probabilities
- Product Rule, Permutations, and Combinations
- Conditional Probability $P(A \mid B)$
- Bayes Theorem
- Independence
- Multiplication Rule