Midterm Overview

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Contents

1 Chapter 1: Statistical Data

- definition of variable types
  - Categorical: nominal and ordinal
  - Quantitative: Interval and Ratio

2 Chapter 2: Descriptive Statistics and Displays

- Categorical:
  - Frequency Tables, bar charts
- Continuous:
  - Histograms, Sturges' formula
  - Boxplots, modified boxplots
  - Center: mean, trimeed mean, median, mode
  - Dispersion: quantiles, IQR, variance, standard deviation, coefficient of variantion, skewness
  - concentration: z-scores, empritical rule
  - Normality, quantile plots, linear transformations, Box-Cox transformation

3 Chapter 3: Relationships Between Variables

- CQ: side-by-side histograms or boxplots
- CC: two-way tables
- QQ: Scatterplot
  - Strength, direction, form, outliers
  - correlation(direction and correlation) and covariance(only tells directions, not frequently used when talking about correlation, but good concept for later study

4 Chapter 4: Probability and Combinatorics

- Probability:
  - intersection, union, complement of events
- Combinatorics:
  - Permutations (ordered)
  - product and sum rules
  - star and bars

5 Chapter 5: Distributions

- Discrete and continuous random variables:
  - PMFs. PDFs, CDFs, quantiles
  - Expacted value, linearity of expectation, variance, transformations

  - independence, covariance
- Distributions
  - for cheat sheet, the mean and variance for all of the distributions discussed
  - Discrete:...
  - Continuous:...
  - Sampling distributions, CLT
  - **Sampling Distribution of a Proportion** vs **Binomial**
  - ??? if X ~ Binom(n, p), sample for 50 times, X_bar ~ N(np, sqrt(p*(1-p)/n)

6 Chapter 6: Confidence Intervals

7 Chapter 7: Hypothesis Tests

- One- and two-sided z- and t-tests CIs are the same here;
- rejection regions Type I and type II errors, power
- Sample size given and (one-sided and two-sided z- and t-tests)
- **Power curve**
- **Sample size estimation**

8 Chapter 8: Hypothesis Testing with Two Samples

9 Chapter 9: Inference for Variances

10 Chapter 10: Inference for Proportions

11 Chapter 11: Chi-squared Tests

12 Chapter 12: Nonparametric Tests