

**T-701-Rem-4 Week 3, Statistics**

ISwR, Ch1, Ex 1.1, 1.4, 1.5, 1.7

mean and median, optimality criteria, sd, mad, IQR

- Mean or median?
- What exactly do we mean by "best"?
- Optimality criteria met by the mean
- "Off-center" rule for sum of squares
- Standard deviation: Divide by n or n-1?
- Optimality criteria met by the median
- Other measures of dispersion
- All these statistics as estimates of population parameters

Excercises

ISwR, Ch2 (all)  
 Generate and "print" out a hand of cards  
 How many different numbers can a computer handle? What is the largest set the choose() function can treat properly?

Distribution of sample statistics from one sample to another

- Confidence intervals
- Central limit theorem
- Subtopic

Descriptions of probability distributions

- Point probabilities of a discrete distri
- Density of a continuous distri
- Cumulative distribution function
- Quantiles
- Random generators
- Family of R-functions for each distri: d, p, q, r
- Histograms and family
- Distribution functions
- Graphical descriptions

Probability distributions

- As part of a statistical model
  - The basic trick: Find an intelligent ordering of the trials**
- Combinatorics and mathematical brainteasers
  - Binomial distri
  - lacta est alea
  - Dealing ou cards
  - Lotto
  - Election polls
  - Will I pass the exam?
- Distributions derived from combinatorial reasoning
- Distributions derived from (simple) physical conditions
- Distributions mathematically derived as limits
  - The Normal distribution
- Distributions thought up as approxiamtions to reality