APLM: □eek 1–2

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Conceptual framework

- Intuition vs. Educated Intuition and Educated Guess
- Whole might be easier to be understood than part.
- Raw data is not helpful; organized or summarized data is.
- Systematic way of organizing, analyzing, understanding what happened and predicting the future.
  - Estimation/Evaluation from partial sample to whole population.
  - Prediction from the observation from the past.

Possible projects

Reading and Practice

1. Review Simple Linear Regression
2. KNNL, Ch. 5 (NWNK, Ch. 6), Matrix Approach to Simple Linear Regression
3. Download, install and play **R**. Read the sample programs from R classroom.
4. Browse StatLab. Particularly, read the stories and data in DATA and STORY link

Strategy for Regression Analysis

RA Strategy 0: Preliminary

- What is the problem
- How the result will be used or interpreted (impact of the study)
- How the data was obtained (say, nature of the study: Observational vs. Experimental, Cross-sectional vs. Longitudinal, etc)

RA Strategy 1: EDA

Exploratory Data Analysis

- Examination of the data
- Summary: (descriptive) statistics and graphs. R
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RA Strategy 3

Inferences

- Assumptions
- Parameter of interest: Means, Contrast of means, variances and their ratios.
- Point Estimation: LSE, MLE and other methods. Their implementation and justification.
- Confidence I(a)1tervals and other alternatives
- Hypotheses testing: NP lemma, likelihood ratio test and justifications.

Caveats, grey or dark sides

Graphs and Stat figures: □ays of seeing

- Statistical graphs which are commonly employed to help statisticians ”see” the data: scatter plot, histogram, normal probability plot, stem-and-leaf plot, box plot.
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