APLM: Week 1{2

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See Better, Look Better

Everybody has some ability to predict and estimate.
Statistics enhances and sharpens this ability with stat/comp powers.

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.

The Stat Edge

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Evaluation

- Homework
- Team projects and presentations
- Exams (written, oral, onsite and quiz)

Strategy for Regression Analysis

- Data set $(x_i; y_i); i = 1; \quad ; n$.
- Desired to nd out the relation between the variables X and Y.
- Refer to Fig 1.8 on p 14 in KNNL for typical strategy for regression analysis.

RA Strategy 1: EDA

Exploratory Data Analysis

- Examination of the data
- Summary: (descriptive) statistics and graphs
- Single var. graphs: Y, X
- Between or among variables: Y vs. X.
- What are we looking for?

RA Strategy 2-1

Model Development

1. Develop one or more tentative (regression) models
2. Check if these models are suitable for the data at hand
3. If not back to the rst step; otherwise, proceed identify most suitable models

Beyond Numbers

- Statistical signi cance vs. practical signi cance.
- What is the ultimate decision and the criterion of evaluation of the decision?
- The limitation and scope of the inferences. What can go wrong?

Reading and Practice

1. Review Simple Linear Regression
2. KNNL, Ch. 1, 2 and 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
5. Refer to P 12{13, give examples of the studies with 1) observational data 2) experimental data

Learning APLM

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