

550.400: Mathematical Modeling and Consulting

Lecture Notes

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Outline

Preliminaries

Principles

Tools

Arguments from Scale

Graphical Methods

Basic Optimization

Example: Insurance Redlining

Frequently Recurring Elements of doing a Project in Industry:

1. Work Statement
2. Midterm Presentation
3. Progress Report
4. Final Presentation
5. Final Report

Programmings in this class

1. \LaTeX :
 - 1.1 `moderncv`
 - 1.2 `beamer`
 - 1.3 `article`
 - 1.4 `tikz`
2. R:
 - 2.1 `tikzDevice`
 - 2.2 `lm`
3. Git
 - 3.1 `git init .`

Seven Basic Principles

1. Set the context
2. Choose effective examples and analogies
3. Choose vocabulary to suit your readers
4. Decide whether to present #s in text, tables, or figures
5. Report and interpret #s in the text
6. Specify the direction *and* size of an association between variables
7. For many #s, summarize overall pattern

Creating Effective Tables

Example: Cost of Packaging

Example: The Nuclear Mission Arms Race

Example: Maintaining Inventory