Math 377: Operations Research
First Lecture

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http://www.williams.edu/Mathematics/sjmiller/public_html/377Fa16

Williams College

Introduction and Objectives

Introduction / Objectives

Main Topic: Optimization: Linear Programming.

Objectives

- Obviously learn linear programming.
- Emphasize techniques / asking the right questions.
- Model problems and analyze model.
- Elegant solutions vs brute force.
- Apply to real world problems.
- Writing textbook for AMS.

Board of Trustees of Former Students (with jobs!)

Types of Problems

- Diet problem.
- Banking (asset allocation).
- Scheduling (movies, airlines, TSP, MLB).
- Elimination numbers.
- Sphere packing....

My (applied) experiences

- Marketing: parameters for linear programming (SilverScreener).
- Data integrity: detecting fraud with Benford's Law (IRS, Iranian elections).
- Sabermetrics: Pythagorean Won-Loss Theorem, court case.
- Wall Street consulting.

Course Mechanics

Grading / Administrative

- HW: 15%. Class Participation 5%. Midterm 40%. Project 40%. May change a bit. A large portion of work/grade from a group project: you'll give a talk, prepare a well-crafted manuscript, and respectfully listen to reports of others.

- Pre-reqs: linear algebra (analysis, stats, programming a plus).

Office hours / feedback

- TBD and when I'm in my office (schedule online).
- Feedback ephsmath@gmail.com, password first 8 Fibonacci numbers (011235813).

Other

- Webpage: numerous handouts, additional comments each day (mix of review and optional advanced material).
- Opportunity to help write a book.
- PREPARE FOR CLASS! Must do readings before each class.

Other: Advice from Jeff Miller

- Party less than the person next to you.

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- Take advantage of office hours / mentoring.

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- Learn to manage your time: no one else wants to.

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Happy to do practice interviews, adjust deadlines....

Linear algebra textbooks online:
http://joshua.smcvt.edu/linalg.html/book.pdf

Useful links

LaTeX and Mathematica Tutorials and Templates

http://web.williams.edu/Mathematics/sjmiller/public_html/math/handouts/latex.htm

Has templates for using LaTeX for papers, talks, posters, and a Mathematica tutorial.

Also videos on each.

Examples / Jobs

Alabama vs Auburn: 2013

https://www.youtube.com/watch?v=sLO2SmM9gPw

Log ruler (and WCMA)

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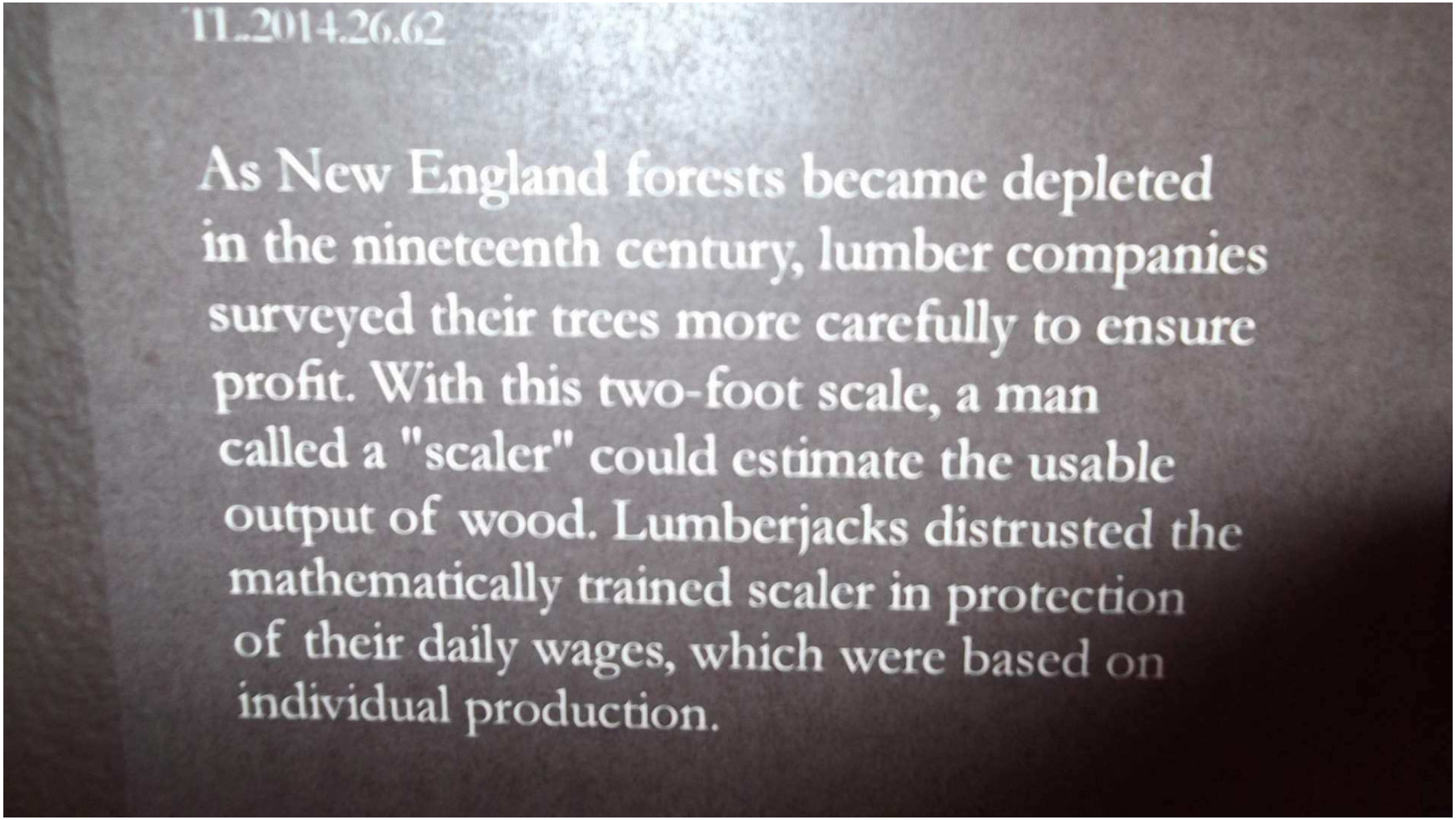

Scheduling: Baseball Tournaments, Swim Lessons

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Inefficiencies from Location

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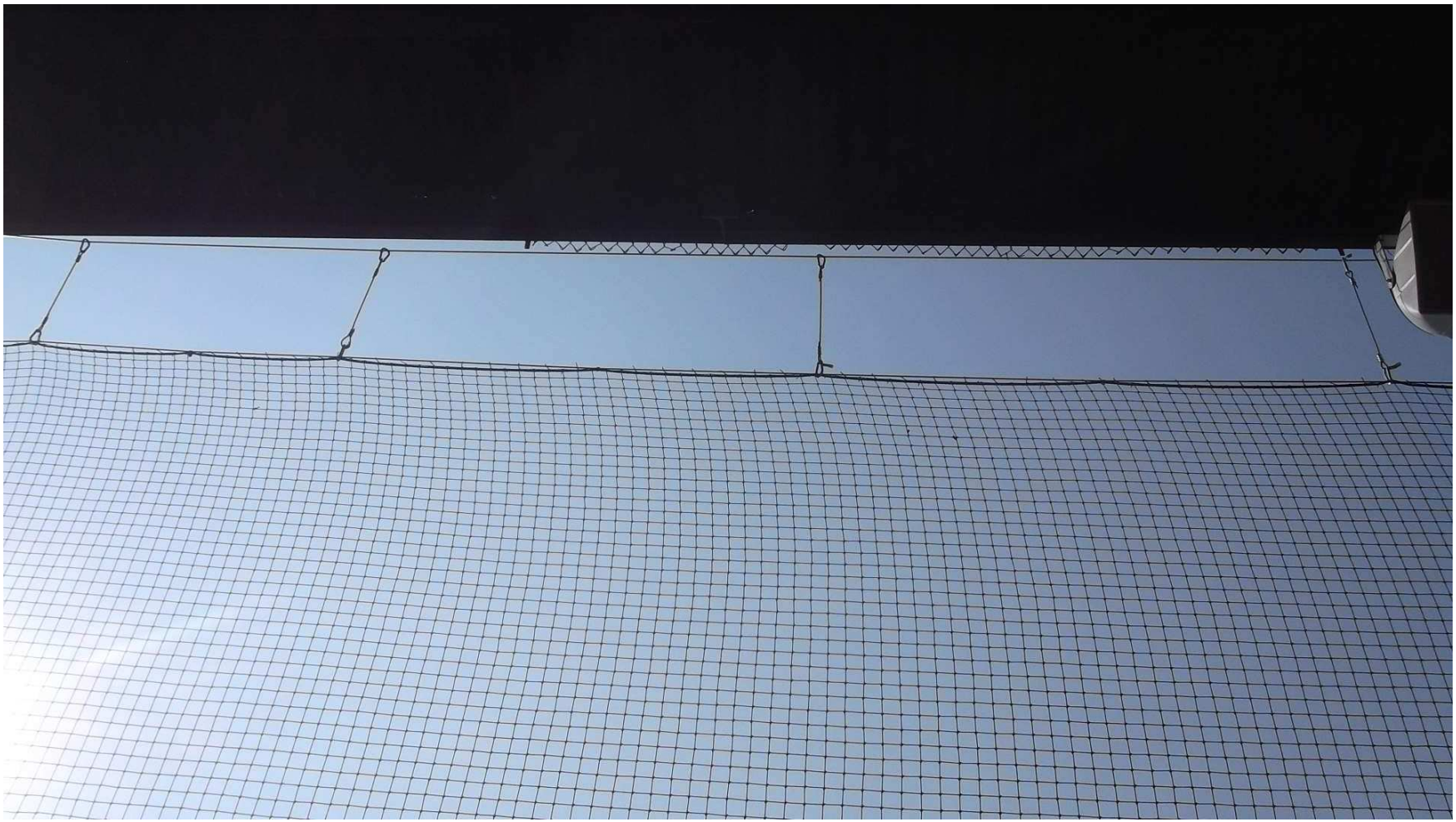

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Pascal's Triangle

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Video on Pascal's Triangle

https://www.youtube.com/watch?v=tt4_4YajqRM