



THE OHIO STATE UNIVERSITY

ISE 3230 Project Description

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Project description

- LP, MILP, Nonlinear (but convex) Optimization
- Related to any problem of interest in
 - Engineering, Finance, Healthcare, Service, Sport
 - Transportation, Facility Location, Product-mix, Investment planning, Scheduling, job sequencing, Traveling Salesman (TSP), Set Covering/Partitioning
- Software
 - Python (Gurobi/CVXPY with Gurobi solver)

Sample topics – from MIT website

- School bus scheduling
- Portfolio optimization
- Optimization in Radiation therapy
- Scheduling residents in a hospital
- Optimal location of cell phone towers
- Meal/diet selection problem
- Optimal strategies for sport teams
- Optimal allocation of wind turbines
- Optimal pricing problem
- Optimal inventory control
- Optimal truck routing
- Solve Sudoku with MIP

Deliverables and deadlines

- One-page proposal is due by Monday **October 31** at 11:59am which includes:
 - Team members names
(Prefer 3 members, NOT more than 4, NOT less than 2)
 - A brief description of the project

NOTE – The proposal must be approved by the instructor; otherwise, the project is unacceptable.

Deliverables and deadlines

- 2:30-4 minutes video describing the project and its results due by Wednesday **November 29, 11:59am** (played in class in the last two class)
 - Send me the video link (one email per group)
 - *Put the project title, name of the team members, our class name and number, and date of the presentation on the title page (and the very first frame of the video)*
- Project report due by Wednesday **December 7, 11:59pm** as one pdf file
 - Must include an introduction/motivation section
 - Must include the list of decision variables, formulation as a whole, and piece by piece along with the corresponding code and description
 - Must include a results section with post optimality analysis
 - Must include an appendix with the link to the video uploaded on a server online
 - Must include an appendix with the link to a GitHub repository that contain all codes and data
 - Must include an appendix that describes the tasks done by each team member
 - **reports** must be submitted **online to Carmen** *per group as one pdf file*
- Name the files as
 - group08_report.pdf

Project Rubric

- Novelty of the project (10 pts)
- Complexity (10 pts)
- Correctness of the Math program (20 pts)
- Efficiency of the math program (10 pts)
- Efficiency of the code (10 pts)
- Presentation (15 pts)
- Report (15 pts)
- Conformance of the final project with proposal (10 pts)

Some possible resources

- <https://www.kaggle.com/>
- <https://www.gapminder.org/>
- <https://www.irit.fr/wind-competition/2014/>
- <https://www.data.gov/>
- <http://archive.ics.uci.edu/ml/>
- LP, MILP, convex course websites (other universities)
- Also, checkout my homepage for couple of projects from previous years:
 - <https://u.osu.edu/davanloo/teaching/>