CS 524: Introduction to Optimization
Lecture 16 : Projects and Data

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Course Project

- The fundamental goal of the course is to equip you with the experience and background necessary to model and implement a real, large-scale optimization problem.
- We will do a class project in which you will define, model, solve, analyze, and explain the solution(s) to a decision problem of your own choosing.
- Typically (and ideally), students come to class having an idea of the project they would like to do.
- We will try and give some additional ideas.

Typical Project Expectations

- Write one page outline of project and get it approved by me. (Around end of Oct). Respond to questions about project
- Implement an optimization model, describe/output results in a form reasonable for the application. Describe, modify, and implement improvements to the original format if necessary.
- At end of course, turn in a GAMS/python completed application
- A potential oral defense of project.

Project: essentially a kind of case study

Projects `http://www.neos-guide.org/Case-Studies`

- A "web" description of a problem, understandable to the general public.
- A model and submission that would solve the problem and provide some form of output/visualization.
- Ability to change data of problem, and then resolve to gain more intuition on the model.

- Ideally delivered as a Jupyter notebook.
- Make clear what you have done, and detail your contribution to the "question at hand".

What you need to do

- Each student must:
  1. form a team of at most 2 people from the class
  2. individually submit a one page (12pt font, 1 inch margins) pdf spec of the project
  3. spec for each team member must be identical
- Spec must include 5 sections:
  1. What is the issue being addressed?
  2. Where does the data come from and how will it be obtained?
  3. What is the optimization problem underlying this project?
  4. What are the deliverables?
  5. Other points for me to consider when evaluating.
- I will provide short feedback on this spec.
- Final submission (in the form of a Jupyter notebook, or a MIRO or Matlab or R application, and all source files in a zip archive) is due at 12:25pm on Dec 19. Each application must have components that address each of the points noted in the project outline above.

Repeat: typical project expectations

- Write one page (pdf) outline of project (by Nov 6 at 9:30AM) and get it approved by me. Respond to hand scrawled questions about project
- Implement an optimization model, describe/output results in a form reasonable for the application. Describe, modify, and implement improvements to the original format if necessary.
- At end of course, turn in
  - a Jupyter notebook, or GAMS/python application or
  - a GAMS/MIRO completed application, or
  - a Matlab or R application,
- that includes the description of the problem, the model, how to run it, some visualization and an ability to change data and run again.
- If you ran into significant problems with certain aspects of the project, you should detail (in at most 1 page pdf) what the changes you made were, and why they were necessary/time consuming.
- A potential oral defense of project.

Grading

- Projects will be marked out of e.g. 100 (will be scaled so score is correct percentage of final grade)
- Individual projects will get this score.
- For group (of 2) projects, each student will get identical score that will be 0.92 of original project score.