Network Models in Operations Research (550.463)
Project Presentation (Due Week of November 30, 2015)

There are a variety of topics in network modeling that we will not have time to cover in class. The purpose of these presentations is to introduce the class to these areas for further study. Your presentation should include (to varying degrees) a problem description, any relevant theory (not already covered in class), and a discussion of algorithm(s) used to solve the problem. The presentation should be approximately 20 minutes in length. While there is no requirement to do so, feel free to use computer and projector for your presentation. (You may have to provide your own computer.)

Presentations will be Monday, November 30, Wednesday December 02, and Friday, December 04. Please be ready to present on November 30. The presentation schedule will be done by sign-up – first come, first serve.

Please rank the following topics in order of your preference. Submit your preference list to Dr. Castello who will make the topic assignment. If you have an alternative topic you would like to study, please obtain permission from Dr. Castello first.

- Application 4.4: Tramp Steamer Problem. (If you choose this problem, you must implement the Binary Search Algorithm discussed in the text.)
- Application 6.2: Problem of Representatives. (You must use MATLAB's `graphmaxflow` function.)
- Application 8.1: Baseball Elimination Problem. (You must use MATLAB's `graphmaxflow` function.)
- Application 13.5: Cluster Analysis
- Application 14.1: Urban Traffic Flows
- Application 16.2: Directed Traveling Salesperson Problem
- Application 16.3: Vehicle Routing
- Application 19.7: DNA Sequence Alignment. (You must implement a shortest path algorithm for this problem.)
- Application 19.10: Just-In-Time Scheduling. (You must implement a minimum cost flow algorithm for this problem.)
- Application 19.11: Time-Cost Tradeoff in Project Management. (You must implement a minimum cost flow algorithm for this problem.)
- Application 19.18: Rectilinear Facility Location. (You must implement a minimum cost flow algorithm for this problem.)

Submissions. Please

1. Create an example problem scenario (i.e., sample data for your topic) as illustration. You should not use an example from the text that has already been solved.

2. Write MATLAB code that will solve a generic version of your problem. NOTE: Unless otherwise stated, you may solve your problem by using any of MATLAB's optimization solvers (e.g., `linprog`, `intlinprog`, `graphmaxflow`, etc.). If you choose to use one of MATLAB's optimization solvers,

   - your presentation should include a discussion of a generic formulation of the mathematical model;
   - your presentation should include details about the MATLAB optimization solver you are using;
   - your code should be able to read in problem data from a text file or Excel file and create the required inputs for the optimization solver you are using.

   Test your code on your example problem scenario.

3. Provide

   (a) "lecture notes" (e.g., presentation slides or typed notes) for the class (and an electronic copy of your notes for Dr. Castello).

   (b) For Dr. Castello, an electronic copy of any code you created to solve your problem.