Project Optimization for Data Science

1 Organization

This project is a group assignment, with each group consisting of 5 students. Groups are formed as follows:

- You can organize groups yourself through canvas.
- Students not yet in a group at the end of week 3 will be assigned randomly to a group.

There are 2 important deadlines for the project.

- The deadline for the report is March 28 at 13.30 (just before the first presentations).
- In week 7 & 8, each group gives a 15 minute presentation. The exact schedule will be communicated at a later time.

2 Instructions

For this project, your goal is to familiarize yourself with an optimization problem, and make use of the solution techniques seen during the lectures. As a group, you should produce a report containing the following information.

1. A literature study. The problem description will give you sufficient information to identify relevant papers. In this section, you should discuss a number of related papers. The following questions can guide you
   - Which techniques are used to solve this problem?
   - Is the problem part of a larger class of problems, or are there interesting special cases?
2. Problem formulation.
   - Give a formal linear/integer/non-linear programming formulation for the problem.
   - Can you give formulations that differ from those in the literature?
   - Discuss benefits and drawbacks of your own models, and those from literature.
3. Solution methods
   - Describe how the problem can be solved.
     - Exactly
     - Using heuristics

- Solution methods differing from literature are strongly encouraged.

4. Results
    - Describe the results you obtain from the methods described in "solution methods".
    - Can you solve (some instances of) the problem exactly? How quickly?
    - What is the quality of solutions you obtain using heuristics?
5. Group member contributions.
    - Make it clear which group members contributed to which aspects of the work and report.
    - Every group member should be involved in the development of solution methods.