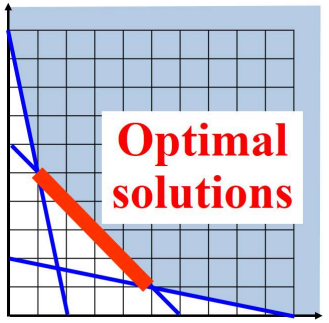
Exercise 10-1 (Use of LP):

(1) Find at least two LP (Linear Programming) software packages.

(2) Generate a simple LP problem example with a single optimal solution.

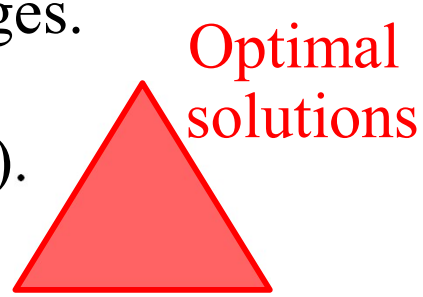
(3) Solve the generated example using your LP software packages. This is to confirm that you are correctly using the packages (i.e., to check whether the optimal solution is obtained by each of your packages).

(4) Generate a simple LP problem example with an optimal solution set on a line (i.e., a one-dimensional solution set).



(5) Solve the generated example using your LP software packages. This is to examine which solution is obtained by each of your packages.

(6) Generate a simple LP problem example with an optimal solution set on a plane (i.e., a two-dimensional solution set).



(7) Solve the generated example using your LP software packages. This is to examine which solution is obtained by each of your packages.

Your presentation will be mainly about your LP software packages, your LP problem examples, and your experimental results. Use LP packages. **Do not use IP (Integer Programming) packages.**

Exercise 10-2 (Examine the performance of LP):

Our TA will give you three LP problem instances (small-scale, medium-scale, and large-scale instances). Solve the given problem instances using your LP packages. Then compare your packages using the following criteria:

(1) Scalability (i.e., whether your LP packages are applicable to all the given problem instances).

(2) Computation time of each package on each problem instance.

Hints:

1. If you find different LP packages based on different LP algorithms in the same platform (with the same computer language), you will be able to compare them from the following viewpoints:

- the obtained solution by each algorithm, which can be different,
- the computation time of each algorithm, which can be totally different,
- the applicability (scalability) of each algorithm to large-scale LP problems, which may be similar.

You will be able to do the same if you find an LP package with different LP algorithms.

2. If you find different LP packages based on the same LP algorithm in different platforms (with different computer languages), you will be able to compare them from the following viewpoints:

- the obtained solution by each package, which should be the same,
- the computation time of each package, which can be totally different,
- the applicability (scalability) of each package to large-scale LP problems, which can be totally different.