Convex Optimization
Matlab Assignment-1

Feb. 11, 2017

Note: Please use Sedumi (solver) and Yalmip (solver interface) to solve the following optimization problems. Please read the usage of the following commands in Yalmip: 'sdpvar', 'sdpsettings', 'optimize' etc. (https://yalmip.github.io/tutorial/basics/).

Q1: Solve the following linear feasibility problem.

$$\min_{x_1,\, x_2} \quad 0$$

$$\text{s.t.} \quad x_1 \geq 0, \quad x_2 \geq 0, \quad x_1 + x_2 \geq 1, \quad x_1 + x_2 \leq 2, \quad x_1 + 2x_2 \geq 2.$$

Q2: Solve the following linear optimization problem.

$$\min_{x_1,\, x_2} \quad 2x_1 + 3x_2$$

$$\text{s.t.} \quad x_1 \geq 0, \quad x_2 \geq 0, \quad x_1 + x_2 \geq 1, \quad x_1 + x_2 \leq 2, \quad x_1 + 2x_2 \geq 2.$$

Q3: Solve the following linear optimization problem.

$$\min_{x_1,\, x_2} \quad 2x_1 + 3x_2$$

$$\text{s.t.} \quad x_1 \geq 0, \quad x_2 \geq 0, \quad x_1 + x_2 \geq 1, \quad x_1 + x_2 \leq 2, \quad x_1 + 2x_2 \geq 2, \quad -x_1 + x_2 \leq 1.$$