

Additional Exercises for *Convex Optimization*

Stephen Boyd

Lieven Vandenberghe

December 28, 2024

This is a collection of additional exercises, meant to supplement those found in the book *Convex Optimization*, by Stephen Boyd and Lieven Vandenberghe. These exercises were used in several courses on convex optimization, EE364a (Stanford), EE236b (UCLA), or 6.975 (MIT), usually for homework, but sometimes as exam questions. Some of the exercises were originally written for the book, but didn't make the final cut.

Many of the exercises include a computational component using one of the software packages for convex optimization: CVXPY (Python), Convex.jl (Julia), CVX (Matlab), or CVXR (R). We refer to these collectively as CVX*. The files required for these exercises can be found at https://github.com/cvxgrp/cvxbook_additional_exercises. From 2023 on, new problems use Python only.

You are free to use these exercises any way you like (for example in a course you teach), provided you acknowledge the source. In turn, we gratefully acknowledge the teaching assistants (and in some cases, students) who have helped us develop and debug these exercises. Pablo Parrilo helped develop some of the exercises that were originally used in MIT 6.975. Sanjay Lall and John Duchi developed some other problems when they taught EE364a, and the instructors of EE364a during summer quarters developed others.

We'll update this document as new exercises become available, so the exercise numbers and sections will occasionally change. We have categorized the exercises into sections that follow the book chapters, as well as various additional application areas. Some exercises fit into more than one section, or don't fit well into any section, so we have just arbitrarily assigned these.

Course instructors can obtain solutions to these exercises by email to us. Please tell us the course you are teaching and give its URL.

Stephen Boyd and Lieven Vandenberghe

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Liying Dong



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