

Homework #0 (Getting started in Optimization)

CS 169/268 Optimization

Fall 2024

Due: Monday October 7 11:59pm on Canvas

Read:

Kochenderfer and Wheeler, Chapters 1-2, and Appendices A and C.1 - C.3.

Also *Read*: Belegundu and Chandrupatla, Chapter 1.

Also for mathematical use review the letters of the Greek alphabet, lower and upper case, symbols and names, if you don't already know them.

Grad students: Read up on matrix norms: Either (a) this [Wikipedia article](#), *optionally* supplemented with material from Bertsekas Appendix A, or (b) review another source of your choice e.g. it's in Golub and Van Loan section 2.3 or so.

1. *Read* the following ground rules for all homeworks, including and after HW0:

- * Grad students use Julia
(nontrivially at the top level - optionally can call C++, Gurobi, etc.)
- * Undergrads use Julia or Python (Slower! and no book code! But maybe more familiar.)
(nontrivially at the top level - optionally can call C++, Gurobi, etc.)
- * Grad students do more problems, and more difficult ones
- * All turn in :
 - (1) complete **source code** file(s)
(which support all reported results, but which may or may not get read in grading), **and**
 - (2) free-standing grade-able PDF containing both ...
 - (2a) well-written, grammatically correct **narrative description** of methods & results including tables and/or plots, **and**
 - (2b) the **source code** from (1) (which again we may or may not read).

E.g. use Jupyter if possible - that combines (2a) & (2b), interleaved; *or*
E.g. use a literate programming tool {—> latex —> pdf; also executable}; *or*
Old fashioned free-standing code files in native and PDF formats,
plus a well-written, grammatically correct narrative document in PDF.
- * For ease of grading as well as optimal learning, our preferences are Jupyter and Julia. But the actual rules are looser, as above.
- * Plots and numerical result tables have error bars, from narratively described experiments, or a valid explanation (unlikely!) of why the results are really & deeply deterministic.
- * Disclose and cite any code you used that you did not write yourself (including code from our textbooks and readings). (This way there is no possibility of plagiarism - disclosure is your friend.) If you altered such code, explain that too. *Do not* use other people's *results*, even if you use their codes. All results should be your own personal effort.

The foregoing rules are hereby incorporated into all future homework assignments!

(Continued on page 2 ! ...)

2. *Set up* your computer environment for subsequent homeworks, with Julia and Jupyter (and/or optionally, if you are an undergraduate, Python and Jupyter).
3. Using the setup of #2 above, *run* two example codes from Kochenderfer and Walker Chapter 2. Use comments to attribute the code to K&W, and turn it in to Canvas in accordance with the constraints of #2 above. (continued)

Note that all ICS general computing lab systems should now be set up with Julia and Python. Also ICS has in the past implemented Jupyter Notebook, working with both Julia and Python.