

Math 164: Optimization – Homework 8

Due: November 18, 2016

Exercise 1.

Exercises 10.5 and 10.8(b) from the book of Chong and Zak.

Exercise 2.

Consider the quadratic function from Exercises 11.5 from the book of Chong and Zak. Instead of solving the exercise as it is written, consider the following questions.

- (1) Find its minimizer in at most 2 steps using the conjugate gradient algorithm starting from $x^0 = (0 \ 0)^\top$. Now compare your solution with the expression of the minimizer, computed using FONC.
- (2) Construct two “obvious” directions that are Q -conjugate w.r.t. the Hessian of the above function. Find two linearly independent initial guesses for which the conjugate direction algorithm (using the previously constructed directions) achieves the minimizer in exactly one step. Perform the steps of the algorithm in both cases.

Exercise 3.

Exercise 11.1 from the book of Chong and Zak.

Exercise 4.

Exercises 11.3 and 11.6 from the book of Chong and Zak.