CS 266 Homework 1

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Problem 4.11

Give an example of a 2-dimensional linear program that is bounded, but where there is no lexicographically smallest solution.

This happens in the case where an entire edge of the bounded region is the smallest solution.
Here is a simple example of that. These are the constraints:
$x \leq 4$ and $x \geq 0$
$y \leq 4$ and $y \geq 0$
Our objective function to minimize is then y.
The whole edge where $y = 0$ is the best solution.

Problem 4.14

4.14 Here is a paranoid algorithm to compute the maximum of a set A of n real numbers:
What is the worst-case running time of this algorithm?
What is the expected running time (with respect to the random choice in line 3)?