

Math 581d, Fall 2010, Homework 5

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Due: November 3, 2010

Do the following 3 problems, and turn them in by email (wstein@gmail.com) on Wednesday, November 3, 2010. As usual, you can find the latex of this file at <http://wstein.org/edu/2010/581d/hw/>. The purpose of this assignment is to get you started on your final project.

1. Choose a mathematical algorithm of interest to you (e.g., “Fourier transform”, “LLL”, “Strassen matrix multiplication”, etc.), and describe it in detail.
2. Where is it implemented? For example,
 - (a) Is the algorithm you just described implemented anywhere in Sage? If so, where? In how many different packages/libraries, etc.?
 - (b) Is the algorithm you just described implemented anywhere in Magma/Maple/Matlab/etc (just chose some subset of interest to you)?
 - (c) How does the performance compare between the various implementations?
3. Implement in Sage a “toy” special case version of the algorithm. (This is something to spend an hour or two on, not days!) Start your implementation in a new directory, create a Mercurial repository, and commit frequently. Your solution to this problem should be a zip or tar archive of this whole directory (including the hidden .hg subdirectory).