18.335 Problem Set 5

Due Friday, 16 November 2011.

Problem 1:

Trefethen, problem 38.6. (The files SD.m and A386.m on the web page are helpful.)

Problem 2:

In problem 3 of the Fall 2008 midterm for 18.335, it was claimed that you could use the conjugate-gradient algorithm for a Hermitian positive semidefinite matrix A, with a random starting guess, to find a vector in the null space (see the midterm solutions). Demonstrate this by means of an example, in Matlab, and plot the norm of the residual vs. iteration. (You can construct a random positive-semidefinite matrix A via, for example, `B=rand(198,200); A = B' * B`).