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18.085 Computational Science and Engineering I
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18.085 Homework 3 MATLAB problem

For the matrices of MATLAB 1, using 3 first differences for $-du'' + u'$, find the eigenvalues of all three for $h = 1/11$. Then do the same with $d = 1/25$ reduced to $d = .01$. You can reduce d more if you want. I am expecting bad/good to be somehow identified by the eigenvalues—and maybe by the eigenvectors too! You could use `[V,E]=eig()` and find the the singular values of V to see how far the eigenvectors are from orthogonal. The singular values are `sqrt(eig(V'*V))` and the ratio of largest to smallest is the *condition number* of V .