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Math128A: Numerical Analysis

Programming Assignment #5, Due Dec. 10, 2008

This programming assignment tests the numerial accuracy of Gaussian elimination with two different pivoting strategies: partial pivoting (gepp) and complete pivoting (gecp).

We will solve the linear equations $Ax = b$, using `gepp.m` and `gecp2.m` from the class website. We will choose A to be the Kahan matrix (`kahan.m` from the class website) and $b = A\,(1, \cdots 1)^T$ so the solution should always be $(1, \cdots 1)^T$.

In this assignment, we need to solve $Ax = b$ for this choice of A and b, and for $n = 50, 100, 200, 400, 800$. Your program should produce two plots. One plot compares the time (in seconds) it takes to solve this equation with these two different methods for $n = 50, 100, 200, 400, 800$; and the other plot compares the numerical errors $\left(\|x - (1, \cdots 1)^T\|_\infty\right)$ of these two methods.