



Department of Mathematics
University of Houston
Numerical Analysis I
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Numerical Analysis I (1st Practical Homework Assignment)

Practical Exercise 1 (*Column pivoting with row exchanges*)

Write an executable program which solves the linear system $Ax = b$ with $A = (a_{ij})_{i,j=1}^n \in \mathbb{R}^{n \times n}$, $b \in \mathbb{R}^n$, by Gaussian elimination with and without column pivoting. Run the program for the example

$$a_{ij} = \begin{cases} \delta, & 1 \leq i \leq n-1, j = i \\ 1, & 1 \leq i \leq n, j = n \\ -1, & i > j \\ 0, & \text{else} \end{cases}, \quad b_i = \begin{cases} 2 + \delta - i, & 1 \leq i \leq n-1 \\ 2 - n, & i = n \end{cases}.$$

For $n = 20$ and $\delta = 0.1$ print in both cases the computed values x_1, \dots, x_{20} .

Delivery either by email (rohop@math.uh.edu) or in class at latest on September 25, 2009.