In this class:

September 29, 2016

Solving Ax=b with Pivoting

- *Solving Ax=b with Gaussian Elimination and LU and partial pivoting*

Next class

Operations in solving Ax=b
G&C – Chapter 7

Next next class

QR Factorization & Least Squares
G&C – Chapter 7.6

Solving Ax=b

We use Gaussian Elimination to solve Ax=b

We record the steps in a matrix factorization

$$A = LU$$

So that we can "replay" them more efficiently.

Solving Ax=b

But – there are some issues with this!

- Pivoting is necessary to make this work on the computer!

- Swapping rows to avoid dividing by (i) zero or (ii) small numbers

THEOREM A matrix is non-singular if and only if the pivoted LU decomposition succeeds without dividing by zero