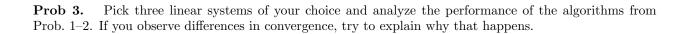
$\begin{array}{c} {\rm Math~128B,~Spring~2021.}\\ {\bf Homework~2,~due~February~6.} \end{array}$

For all problems, turn in your code (and MATLAB diaries when needed).

Prob 1. Create a MATLAB function that inputs a function A, vectors b and $x^{(0)}$ and a tolerance tol, and finds an approximate solution to Ax = b using the Jacobi method.

Prob 2. Same as in Prob. 1 for the Gauss-Seidel method.



Prob 4. Let A be a square matrix and let $\|\cdot\|$ be any matrix norm (not necessarily natural/induced). Prove that $\lim_{k\to\infty}\|A^k\|=0$ if $\rho(A)<1$. Hint: without loss of generality, it is enough to prove this fact for a matrix in its Jordan normal form – and a particular matrix norm. (Why?)