Tony Szedlak
Numerical Linear Algebra
Project Plan

My project will display the importance of eigenvalues and eigenvectors. I will do this by simulating vibrations through a 1D, 2D and (possibly) 3D crystal lattice of varying configurations such as cubic, face centered cubic, etc., with and without damping. Changing the configurations to anything but cubic may be a bit too ambitious, but I will try.

The eigenvalues found will be proportional to the square of the resonant frequencies of the lattice, and these will be used as the driving frequencies of the system. The eigenvectors will also be calculated, and these will be the initial displacement from the rest positions of the particles for the undamped system. To make the presentation a little more visually appealing, I will create Matlab movies showing the vibrations moving through the lattice.

I will most likely use Matlab's built-in function **eig** to find the eigenvalues and eigenvectors, since the built-in function will likely be faster and more accurate.

Need to include:
- Explicit creation of the matrices;
- Discuss sparsity patterns;
- Discuss matlab eigen solver algorithm and choices;