Some Basic OpenMP Coding for Parallelism

The Main Question for Math 4610 at USU

- Using your code for the Power method for finding eigenvalues of square matrices put together a code that will find as many eigenvalues as possible between the largest and smallest eigenvalues.
- The general algorithm for the problem is:
  - Use the Power Method to find the eigenvalue of largest magnitude using the standard power method. The output from this step should be the eigenvalue and eigenvector for the largest value.
  - Next apply the inverse Power method to find the smallest eigenvalue for the matrix. The output here should be the smallest eigenvalue and associated eigenvector.
  - The next step is to define an array of equally spaced points between the smallest and largest eigenvalues. Start with one or two points. Apply the shifted Power method to each of the given values by shifting the problem to the interior points and apply the inverse Power method to the shifted problem.
- To acid test your code, generate a matrix with positive entries that is symmetric and diagonally dominant. Try this out on a small matrix before applying the ideas of a large matrix.