Some Basic OpenMP Coding for Parallelism

The Main Question for Math 4610 at USU

- First implement the Power method for approximation of the eigenvalue of largest magnitude. Make sure you test the algorithm on a couple of matrices. Use a matrix with random entries. Also, to get started make sure the matrices you use are diagonally dominant. One way you can generate a diagonally dominant matrix would be to initialize the matrix entries to a uniformally distributed values in $[0, 1]$ and then add positive values to the main diagonal. If you use the modification being the number of rows in the matrix.
- Implement the Inverse Power Method for finding the smallest eigenvalue of a square matrix. Use Jacobi Iteration to solve the linear system of equations associated with each iteration..

OpenMP

- Using OpenMP directives, speed up the matrix-vector product needed at each iteration of the Power Method. Note that the matrix-vector routines you created in the last assignment can be used as a template for the product in your Jacobi iteration.