

ASSIGNMENT 1

Due September 23, 2003

Problem 2

1. Given the matrix

$$\mathbf{A} = \begin{bmatrix} 6 & 2 & 1 \\ 2 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix},$$

make use of the Gershgorin Theorem to find the 3 disks which encircle each of the eigenvalues. Note that since the matrix is real and symmetric, all the eigenvalues must be real.

2. Write a Matlab program to implement inverse iteration with a shift to compute all the eigenvalues and their corresponding normalized eigenvectors. You may use any starting vector. Your choice for the shifts should be guided by your result in part 1. For simplicity you may use Matlab's back-slash operator. For extra credit, use appropriate programs that we have developed last semester for solving linear systems in chapter 3.
3. Use Matlab's *eig* function to compute all the eigenvalues and eigenvectors of the matrix, and compare the results with those obtained in part 2.