Math 307: Problems for section 4.3

November 14, 2012

1. **The matrix**

$$A = \begin{bmatrix} 6 & 1 & 2 & 2 & 1 \\ 1 & 5 & 2 & 1 & 2 \\ 2 & 2 & 3 & 1 & 2 \\ 2 & 1 & 1 & 3 & 2 \\ 1 & 2 & 2 & 2 & 3 \end{bmatrix}$$

   has positive eigenvalues. Use the power method to find the largest and the smallest ones, and the corresponding eigenvectors. Check whether the two eigenvectors you have computed are orthogonal.

2. **Using the power method, find the eigenvalues closest to -6 and closest to 1 for the matrix:**

$$A = \begin{bmatrix} 1 & 7 & -11 & 2 & 5 \\ 0 & 1 & 4 & 8 & -2 \\ 0 & 1 & 0 & 1 & 0 \\ 2 & 0 & 2 & 4 & 5 \\ 7 & 8 & 2 & 3 & 0 \end{bmatrix}$$

   Also write down the MATLAB/Octave commands you used to find your answer.