

Math105LB - Project 3

Due: March 23

March 13, 2007

Write a main function (**function FirstLastname()**), which can do the following things (put all in the same file and print the result into a file: FirstLastname.txt):

1. Initialize matrix $A = [4, 1, 1, 1; 1, 3, -1, 1; 1, -1, 2, 0; 1, 1, 0, 2]$ with an initial guess $x^{(0)} = (1, -2, 0, 3)^t$,
 - (a) (25 points) Call Power method to find the eigenvalue of A with the largest magnitude, and print the final result (eigenvalue, the number of iterations).
 - (b) (25 points) Call Inverse Power method to find the eigenvalue of A with the smallest magnitude, and print the final result (eigenvalue, the number of iterations).
 - (c) (25 points) Call Deflation method to find the second dominant eigenvalue of A , and print the final result (eigenvalue, the number of iterations).
2. (25 points) Initialize $A = [0.5, 0.25, 0, 0; 0.25, 0.8, 0.4, 0; 0, 0.4, 0.6, 0.1; 0, 0, 0.1, 1]$, Use the QR Algorithm to determine, to within 10^{-5} , all the eigenvalues of the matrix A , and print the final result (eigenvalue vector, the number of iterations).