Cs 417

Final Exam

Spring 2018

There are 6 data files in the same directory as this exam. Each contains an integer N, followed by N\*N doubles representing the matrix A, and lastly N values representing the vector b. Graph the solution as a surface plot. You must use the solvers that you have submitted via blackboard.

1. Solve q1 using Gaussian Elimination
2. Solve q2 using LU decomposition
3. Solve q3 using Jacobi iteration
4. Solve q4 using Gauss-Seidel
5. Solve q5 using SOR and omega = 1.15
6. Solve q6 using the solver of your choice.
7. Use the power method to solve for the dominant eigenvalue and eigenvector for the following matrix. Stop your solver after 11 iterations.
8. 11 -5

-2 17 -7

-4 26 -10

1. Use the method of steepest descent to solve the minimization of the following equation, use initial X = {-3,3}T

F(x) = 25x1^2 + 20x2^2 – 2x1 - x2

1. Use Newton’s method to solve for a root of  x2-sin x, use an initial guess of 0.5 and please recall that the derivative of sin x = cos x, compute the solution to 3 decimal places.
2. This question is really, really hard. So hard I couldn’t solve it, unfortunately I have already saved and posted this exam so I can’t write it out here, I will have to just give everyone credit for it.