**Numerical methods**

**Assignment 3**

1. Assume any 4 X 4 matrix such that the diagonal is dominant. Let the coefficients in each equation be widely differing (e.g. 100 x1+ 40 x2+10 x3 + x4 ). Assume any vector say {1,1,1,1} and generate the right hand vector. Now write a Gauss elimination algorithm without partial pivoting and solve the above problem. Now take the same matrix and rearrange the rows such that the diagonal dominance is destroyed. Re-solve the problem and obtain the solution, and compare the obtained solution with that of the actual answer.
2. Write a problem to solve Problem 1 using Crout’s (LU decomposition) method.
3. Solve the following problem by the tri-diagonal matrix method (Thomas algorithm).

Note that the value of each unknown is 1.

1. Solve the following problem using Gauss-Jacobi and Gauss-Seidel methods.

The exact solution is {1,1,1,1,1}. Solve the problem in single and double precision and comment on the results