LARGE AND SPARSE MATRIX PROBLEMS, 2012

HOMEWORK ASSIGNMENT number 1

Well performed this homework assignment gives 1 credit point

To be handed in by January 27 at the latest

Exercise HA1 a. Solve Question Q6.2 in the text book. (**0.5 point**)
OBS! There is a misprint in part 1. It should be a minus sign in front of the last square root.

Exercise HA1 b. Solve Question Q6.4 in the text book. (**0.5 point**)

COMPUTER EXERCISE number 1

To be handed in by January 27 at the latest

Exercise CE1 a. Perform the programming in Question 6.6.

Exercise CE1 b. Derive the model 2D Poisson's sparse matrix by using the MATLAB functions *numgrid* and *delsq*. Choose the input 'S' in *numgrid* to get a square domain and use different values of the stepzise h in order to be able to answer the questions. Use a permutation to reorder the matrix to red-black ordering. Write a MATLAB program for the Jacobi, Gauss-Seidel and SOR methods. Perform experiments on the convergence rate and compare the speeds of the three methods. Verify that your results confirm the theory in the text book.
About grades. This CE is graded according to how well the discussion is performed regarding confirming the theory by the experiments.