Math 270C: Assignment 4

Due Wednesday, February 9, 2005

Instructor: Luminita Vese

[**1**] Show that the Gauss-Jacobi iteration converges for 2-by-2 symmetric positive definite systems.

[**2**] Consider the 2-by-2 matrix

$$A = \begin{bmatrix} 1 & \rho \\ -\rho & 1 \end{bmatrix}.$$

Under what conditions will Gauss-Seidel converge with this matrix ?

[**3**] Implement the gradient descent method for the model problem from [4], assignment 3. Use again 300 iterations and $h = 1/32$. Plot the error versus iterations. Comment your results.