269C, Spring, Vese

Computer Project 2

Due on Monday, June 7, 2004 (no deadline extension)

Use P_1 elements to approximate the solution of

$$-\triangle u + u = \sin(2\pi(x+y)),\ (x,y) \in \Omega = \text{unit square}$$

with the following boundary conditions:

Case (a) $u = 0$ for $(x,y) \in \partial\Omega$

Case (b) $u = 0$ for $(x,y) \in \partial\Omega$, $x = 0, 1$
$u_y = 0$, for $(x,y) \in \partial\Omega$, $y = 0, 1$.

Base the triangulation on a 10x10 grid.

• What you should turn in: the weak formulations, the linear systems, details about the discretizations, plots of the results, your computer program, etc.

• Section 12.2 of the textbook discusses numerical integration (quadrature) formulas, helpful to discretize the load vector, if needed.