

269C, Spring, Vese

Computational Project 2

Due on Wednesday, May 31st.

Use P_1 elements to approximate the solution of

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

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.