Numerical Methods for PDEs

Homework-8

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Consider the two-dimensional Poisson problem

$$\begin{aligned} -\nabla^2 u &= f, \qquad x \in \Omega \equiv (0,1)^2 \\ u &= 0, \qquad x \in \partial\Omega, \end{aligned}$$

where the right-hand side is chosen such that the solution is given by $u(x,y) = \sin(\pi x)\sin(\pi y)$. As discussed in class, use the Ritz-Galerkin Method with piecewise linear approximation space and nodal basis, to solve the proper variational form of this equation.

The L^2 Norm error is Observed is 0.0335