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// example 1 : poisson-mixedBC.edp [slide page 7]
// finite element solution of Poisson equation with mixed boundary condition
// for tutorial by Japan SIAM, Tokyo, 11-12 Feb.2016, Atsushi Suzuki
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int n = 20;
mesh Th=square(n,n);
fespace Vh(Th,P1);

Vh uh,vh;
real err, hh;

func f = 5.0/4.0 * pi * pi * sin(pi * x) * sin(pi * y / 2.0);
func h = (-pi)/2.0 * sin(pi * x);
func g = sin(pi * x) * sin(pi * y / 2.0);
// for error estimation
func sol = sin(pi * x) * sin(pi * y / 2.0);
func solx = pi * cos(pi * x) * sin(pi * y / 2.0);
func soly = (pi / 2.0) * sin(pi * x) * cos(pi * y / 2.0);

solve poisson(uh,vh) =
int2d(Th)( dx(uh)*dx(vh)+dy(uh)*dy(vh) )
- int2d(Th)( f*vh )
- int1d(Th,1) ( h * vh )
+ on(2,3,4,uh=g);

hh = 1.0 / real(n) * sqrt(2.0);

// int2d uses qf5pT : 5th order integration quadrature
err = int2d(Th)( (dx(uh) - solx) * (dx(uh) - solx) +
                (dy(uh) - soly) * (dy(uh) - soly) +
                (uh - sol) * (uh - sol));
err = sqrt(err);

cout << "DOF=" << uh[].n << "\t h=" << hh << " err-H1=" << err << endl;
```