# Task for lecture 14

Consider the elliptic partial differential equation

$$-\left(\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2}\right)=1+x+y \qquad \text{for} \qquad (x,y)\in\Omega \tag{1}$$

where $\Omega=\{(x,y)|0<x<1,0<y<1\}$ and $u(x,y)=0$ for $(x,y)\in\partial\Omega$

- Set up the system of linear equations for N = 4,8,16,... and solve
- Perform Richardson extrapolation and error estimation for $u(0.5,0.5)$