

Exercise

Task. Solve the Poisson equation

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + 2 = 0, \quad u = 0 \text{ on boundary}$$

for a square region a by a , $a = 1$ using

- a) Liebman method;
- b) SOR method with overrelaxation factor 1.6.

For both methods use grid n by n cells with $h = 0.1$ and $h = 0.05$ and error tolerance $\varepsilon = 1.0e - 10$.

Create computer code, which performs solutions.

Exercise (cont)

Output of your code should contain :

n = number of cells in each direction;

h = stepsize;

iter = number of iterations;

function values along line $y = 0.5$

Graphical illustration of solution for $h=0.1$

