Exercise 2

- Implement a program that solves the Laplace equation for the problem in the figure (Dirichlet boundary conditions). Use the methods available in `scipy.sparse.linalg` for sparse matrices. You can assume that the side of the square is $L = 1\,\mathrm{m}$. Display the results using `plt.contour` and/or `plt.imshow`.

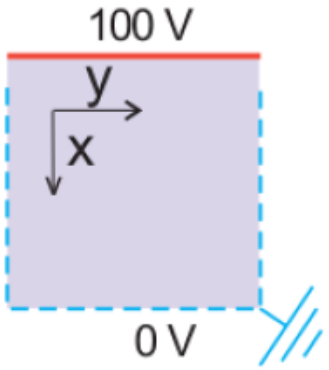

Figure 1: Dirichlet boundary conditions example

- Consider the same problem but solve the system of equations using the Jacobi method (or any other iterative method).
- Repeat the exercise by modifying the boundary conditions on the vertical walls of the square to impose Neumann boundary conditions ($\frac{\partial V}{\partial y} = 0$).