Problem 1: Relaxation method
Implement the relaxation algorithm described in class to find the potential inside a region with the shape as in the figure. The top edge is kept at $\phi = V$ and the other borders at $\phi = 0$. Estimate the error in your answer. Can you achieve a 1% precision at the center of the upper left square? (you can use units where $V = 1, L = 1$).

Problem 2: Dipole layer
Two parallel infinite planes are charged with charge densities $\sigma$ and $-\sigma$. Plot the potential along a direction perpendicular to the planes. What is the potential drop across both planes? *hint: this is as trivial as it looks*

Problem 3: Infinite cylinder
Consider an cylinder with radius $a$ and length $L$. The curved surface and the bottom $z = 0$ face of the cylinder are kept at potential $\phi = 0$. The top of the cylinder is $z = L$ is kept at $\phi = V$. Compute the potential inside the cylinder. Use the properties of these Bessel function you may need without proof.