Homework #9
Computational Microelectronics

Seongpyo Hong

Due on November 8, 2018

1 Results

We have solved the Laplace equation in a two-dimensional (2D) box; the equation reads

$$\nabla^2\psi = 0 \tag{1}$$

We set the four boundary conditions and get the four different solutions. As in Fig. 1, 2, and 3, ψ flows from $\psi = 1$ to 0. On the other hand, when all boundary points (colored boundaries except the black point) are set to 1, ψ is uniform in the box with the value 1.

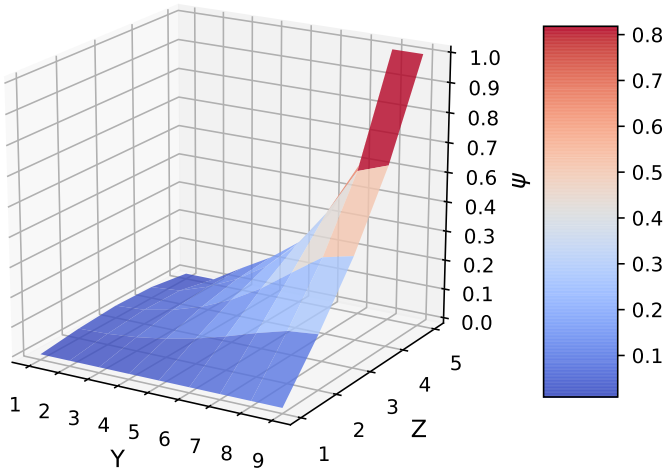

Figure 1: ψ from the following boundary condition; $\psi = 1$ at the two top-right points.

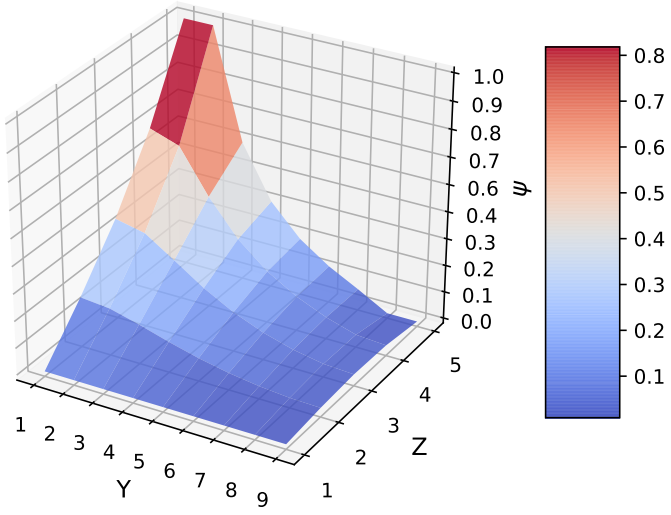

Figure 2: ψ from the following boundary condition; $\psi = 1$ at the two top-left points.

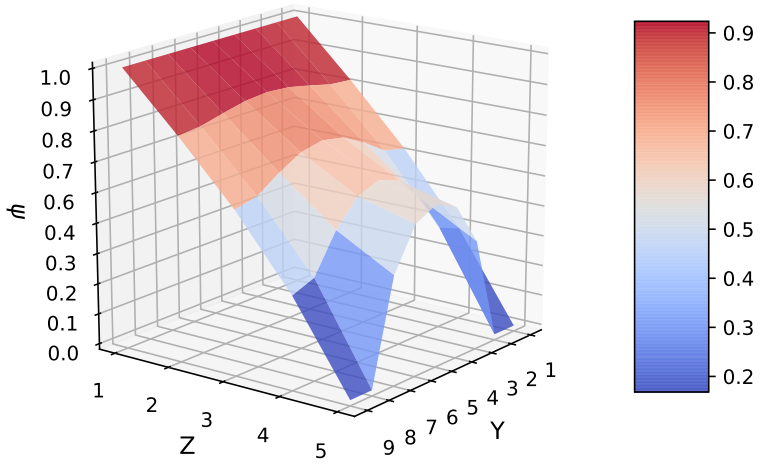

Figure 3: ψ from the following boundary condition; $\psi = 1$ at the 9 bottom points.

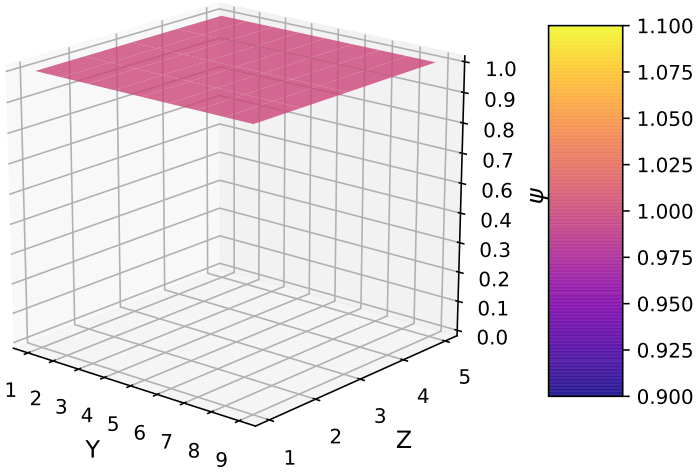

Figure 4: ψ from the following boundary condition; $\psi = 1$ at the all colored points.