1. An electron is confined in a 3D cubic infinite well of side 1nm, compute the energy difference between the ground state and the second excited state.
2. Show that the wave function $\psi_{1,2}(x, y) = \frac{2}{L}\sin(\pi x/L) \cdot \sin(2\pi y/L)$ satisfies the time-independent Schrödinger equation inside the well.
3. Solve time independent Schrodinger equation for a particle trapped in a 2d rectangular well of width “a” along x and “b” along y. Obtain energy eigen value and eigen functions of first two states.
4. List the first six possible distinct energy eigen states of a 3d infinite well.