HW #1
Due September 19 (Monday) in class

1. Consider a "quantum box" with dimension of L x L x L:
   a. What is its E-k relation, i.e., energy-vs-electron wavevector function? For simplicity, assume infinite potential barrier.
   b. Derive the 0-D electron density of state function, $\rho_{0D}(E)$.
   c. Plot $\rho_{0D}(E)$.
   d. If L= 10 nm, what is the electron concentration in a quantum box when the Fermi energy is 30 meV above the lowest energy state? For simplicity, consider T = 0 K.

   (In case you need more conditions, you can make proper assumptions).

2. Problem 3.1 in Chuang.

3. Problem 3.3 in Chuang.