Assignment - Q1

Show that the kinetic energy of a three-dimensional gas of N free electrons at 0 K is

$$U_o = \frac{3}{5} N\epsilon_F$$

Assignment - Q2

Prove that the density of states for a 2D electron gas is constant (i.e $D(\epsilon)$ is independent of ϵ)

Assignment - Q3

Calculate the Fermi energy, Fermi temperature, and Fermi velocity for:

- Copper
- Aluminum
- Graphene

(Assume a free electron gas model and use results derived in this module when appropriate)

How do the calculated results compare to tabulated values?

Assignment - Q4

Solve Kittel 6.12 (density of states – nanometric wire)