Exercise 3.1-1

How far off from perfection is a **1000** Ω**cm** Si crystal (at **300 K**)? The resisitvity given is about the best (i.e. highest) value that **Si** crystal growers can achieve on a routine base.

- Consider what level of dopants corresponds to **1000** Ω**cm**? How far away from perfection (= truly intrinsic behavior) are the crystal growers in terms of dopant concentration?

- For that you must know the *intrinsic* carrier density and resistivity at room temperature in Ω**cm**. Calculate the carrier density with the numbers and relations provided and find some suitable value for the mobility (from the various illustrations in chapter 2).

This exercise not only demands that we generate numbers from some general formulas (which is not as easy as it looks), but also gives an idea of how close we can get to the real numbers with our simple models.

Link to the solution