**Tutorial questions: Some important questions from week 1?**

* What’s the definition of atomic packing factor?

Volume of atoms in a unit cell over volume of a unit cell

* Why we would like to learn about the atomic packing factor?

Determines the properties of a material such as ductility

* What’s the meaning of BCC, FCC, HCP, SC structures?

BCC = Body Centered Cubic

FCC = Face Centered Cubic

HCP = Hexagonal Close Packed

SC = Simple Cubic

* What’s the definition of unit cell?

Basic Unit of a crystalline structure

* What’s the relationship between the mechanical properties of materials and the type of their atomic structure (FCC, BCC, etc.)?

As different atomic structures have different atomic packing factors, they would have different mechanical properties as well. For instance, a FCC material is more ductile than BCC material due to its higher atomic packing factor.

* What’s the difference between elastic modulus and stiffness?

Elastic modulus is an intrinsic property that relates directly to the material itself.

Stiffness is a geometric property

* How many atoms are located in one unit cell of a BCC structure?

2 atoms

* What can we learn from the linear (almost) relationship between density and elastic modulus of different materials?

The denser the object, the higher the elastic modulus