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Problem

- (a) Describe briefly the covalent bond. Give an example.
- (b) Calculate the atomic packing factor of BCC unit cell.
- (c) Gold has an FCC crystal structure and an atomic radius of 0.144 nm. Calculate the density of gold in  $\text{kg/m}^3$ .  $A_{\text{Au}} = 196.97 \text{ g/mol}$ .
- (d) Calculate the linear atomic density (atoms/m) in  $[110]$  direction and the planar atomic density ( $\text{atoms/m}^2$ ) in the  $(111)$  plane in the copper crystal lattice. Copper is FCC and has a lattice constant of 0.361 nm.