1. Determine the basis vectors of the primitive unit cell of the SiC crystal. What Bravais lattice underlies this lattice? Specify the Cartesian coordinates of the basis vectors and all atoms inside the primitive elementary cell. Determine the space group number for the SiC lattice (use https://www.cryst.ehu.es/). Calculate the volume of a primitive elementary cell.

2. Vibration of 1D one-atomic chain of atoms. Equation of motion and its solution in harmonic approximation. Frequency dependence on wavevector. Periodical boundary condition. Total energy calculation by using classical equation and quantum mechanics. Heat capacity calculation.

3. Free electrons approximation. Schrodinger equation and its solution. Fermi energy and chemical potential. DOS function. Heat capacity of free electrons.

4. Don't forget to include the results of the VASP calculation.