1. Assuming that the size of air molecules is about 0.36 nm, evaluate the mean free path of air, and the mean distance between the molecules. (The number density of air is 2.5×10^{19}.)

2. Find the rising velocity of a 0.1 mm bubble in a glass of beer. Find the bubble Reynolds number. Is the flow around the bubble in Stokes regime?

3. Find the aerodynamic diameter of a particle made up of four sphere a tight cluster of four 10 μm spheres with density 1.

4. A dentist drill with a diameter of 1 mm rotates at 50,000 rpm. How far can the drill throw a 40 μm spherical piece of patient tooth?

5. Determine the settling velocity of 0.5 μm silica particles with a density of $2600 \, \text{kg/m}^3$ with and without the effect of Cunningham correction factor.

6. Assume that a particle is moving on a circular path at a constant speed. Evaluate it radial terminal velocity. For the case that a 10 μm particle is moving on a 0.5 m diameter orbit at 100 rpm evaluate the particle radial velocity and radial stopping distance.