* Calculate cross sections for capture and fission and neutron production, using Serpent for the nuclides in the U-Pu cycle. Adopt Pu from spent PWR fuel.
* Calculate the instantaneous in-pile conversion ratio at beginning-of-life, for a particular combination of fuel and coolant assigned to your group (Lead-Metal alloy\*\*)
  + Do the calculation as a function of P/D for P/D = 1.15 to 1.50 and adjust the 238U fraction so that the reactivity in an infinite rod lattice = 0.10, corresponding to 10% leakage in a finite reactor core.
  + Apply a density of 16.5 g/cc for the metal alloy fuel. These values consider the five percent porosity of the ceramic fuels and the presence of 20% Zr in the metal alloy fuel.
  + The gap between the fuel pellet and the cladding should be set to 0.7 mm for the metal alloy fuel. These values permit the swelling of the fuel to be accommodated. In the case of metal alloy fuel, the gap should be filled with sodium.
  + What is the maximum P/D for which a conversion ratio larger than 1.0 is attainable in each case?
  + Discuss how the cross sections depend on the coolant volume fraction.