1. [15pts] Calculate the relative abundances of the isotopes along the Ba isotopic chain during the r-process at a temperature of 1.5 GK and a neutron density of 1e24 cm^(-3) assuming (n,γ)-(γ,n) equilibrium. Relative abundance means relative to the total abundance in the isotopic chain. Set the partition functions equal to one and use the masses from the FRDM mass model provided on the class website.
   a. Give the relative abundances of the 5 most abundant isotopes as numbers
   b. Make a plot of relative abundance versus neutron number that shows the maximum of the distribution. Choose the abundance axis scale such that orders of magnitude (factor of 10) can still be read off easily (tick marks!) but that at least the 5 most abundant isotopes are shown as well.

2. [5 pts] For the abundances obtained in problem 1, compare the location of the most abundant isotope with the isotope obtained using the method used during the in class group exercise (determine the preferred Sn with the equation from the group exercise and give the value found).

3. [5 pts] Can you think of a better method (demonstrate!) to tell where the maximum of the distribution is based on the calculated Sn and the mass data? (Hint: what does the abundance ratio of two adjacent even N isotopes depend on?).