Assignment 3: Gibbs energy of AlNi phase (CsCl type) is modeled using two-sublattices as indicated below:

$$(\underline{Al},Ni)_{0.5}: (Al,\underline{Ni})_{0.5}$$

Calculate the site fractions of its sublattice constituents at 1200 K and 60 at. % of Ni. Write your program to do this. (Due date: 05-04-2018)

Given:

$$G^{AlNi}_{Al:Al} = +10083 - 4.813*T + GHSERAL$$
$$G^{AlNi}_{Ni:Ni} = +8715.08\text{-}3.556*T + GHSERNI$$
$$G^{AlNi}_{Al:Ni} = -56500 - 10.7*T + 1.4975*T*\ln(T) + 0.5*GHSERAL + 0.5*GHSERNI$$
$$G^{AlNi}_{Al:Ni} = G^{AlNi}_{Ni:Al}$$
$${}^{0}L^{AlNi}_{Al,Ni:Al} = -14225 - 5.625*T$$
$${}^{0}L^{AlNi}_{Al:Al,Ni} = {}^{0}L^{AlNi}_{Al,Ni:Al}$$
$${}^{0}L^{AlNi}_{Ni:Al,Ni} = -22050$$
$${}^{0}L^{AlNi}_{Al,Ni:Ni} = {}^{0}L^{AlNi}_{Ni:Al,Ni}$$
$${}^{1}L^{AlNi}_{Ni:Al,Ni} = +1115$$
$${}^{1}L^{AlNi}_{Al,Ni:Ni} = {}^{1}L^{AlNi}_{Ni:Al,Ni}$$
$$GHSERAL = -11278.4 + 188.684*T - 31.7482*T*\ln(T) - 1.231e{+}028*T**(-9)$$
$$GHSERNI = -5179.16 + 117.854*T - 22.096*T*\ln(T) - 0.0048407*T**2$$