Homework 6

Questions 2 and 3 are due before 11:59pm (EST), Sunday April 19th.
Question 1 is due before 11:59pm (EST), Monday April 20th.

1. Suppose the fraction of low-ability ($t = 1$) workers is $1/4$ and fraction of high-ability ($t = 2$) workers is $3/4$. The productivity of a type 1 worker is $2e$ and the productivity of a type 2 worker is $\frac{9}{4}e$, where e is the education level. The utility of wage w and education e to a worker of type 1 is $u_1(w, e) = 4\sqrt{w} - 2e$. The utility of wage w and education e to a worker of type 2 is $u_2(w, e) = 4\sqrt{w} - 1.8e$. Find the Rothschild-Stiglitz equilibrium.

2. The Security Council has 5 permanent members and 10 non-permanent members. For a coalition to win, it must contain all 5 permanent members and at least 4 non-permanent members. View this situation as a simple (voting) game and compute the Shapley Value of the 15 members.

3. Consider a situation involving a landlord and 10 workers that till the landlord's land. If k workers till the land, the outputs is worth k^2 dollars.

(a) Compute the Shapley value of the 11 players involved in this game.

Consider now 2 landlords and 6 workers.

(b) Compute the Shapley value of the 8 players in the case where both landlords need to be present in a coalition for the land to be tilled.

(c) Compute the Shapley value of the 8 players in the case where the presence of any one landlord suffices for the land to be tilled.