General Equilibrium - Problem Set 2
due: classes on the 13th of Dec

Problem 1 (2p) *Consider an exchange economy wiht I consumers, each with rational preferences $\succeq_i$ over $\mathbb{R}^L_+$ and an initial endowment ω_i. Let (x^*, p^*) be a WE. Prove that x^* belongs to the core of this economy.*

Problem 2 (2p) *Consider an exchange economy E with two consumers $1, 2$ and two goods A, B, where consumers have: $u_1(x_1) = \min\{x_1^A, x_1^B\}$ and $u_2(x_2) = x_2^A + x_2^B$. Initial endowment is given by: $\omega_1 = (3, 3); \omega_2 = (5, 5)$. Find the core of this economy and allocation in the Walrasian Equilibrium.*

Problem 3 (2p) *Consider an exchange economy E with two consumers $1, 2$ and two goods A, B, where consumers are characterized by: $u_1(x_1) = \min\{x_1^A, x_1^B\}$ and $u_2(x_2) = 2\min\{x_2^A, x_2^B\}$. Let initial endowment be given by: $\omega_1 = (10, 0)$ and $\omega_2 = (0, 10)$.*

- *Find core of this economy,*
- *Consider $n-th$ replicas of E and corresponding cores C_n. Express C_n as a function of n.*

Problem 4 (2p) *Let $S_i = \{0, 2\} \times \{0, 2\} \times \{0, 2\} \subset \mathbb{R}^3$ and $i \in I = \{1, \ldots, 100\}$.*

- *Define $\sum_{i=1}^{I} S_i$ and con $\sum_{i=1}^{I} S_i$,*
- *Illustrate Shapley-Folkman theorem for $(42.3, 11.6, 22) \in$ con $\sum_{i=1}^{I} S_i$.*

Problem 5 (2p) *Consider an economy with two goods x, y and infinitely many consumers $I = [0, 1]$, each i-th with preferences given by $u_i(x, y) = x^i y^{1-i}$. Endowment if each consumer is given by $(2, 2)$.*

- *Assume prices sum up to one. Derive demand of consumer i as a function of i and p_x, p_y.*
- *Compute equilibrium prices.*
- *Find equilibrium allocation for each i-th consumer.*