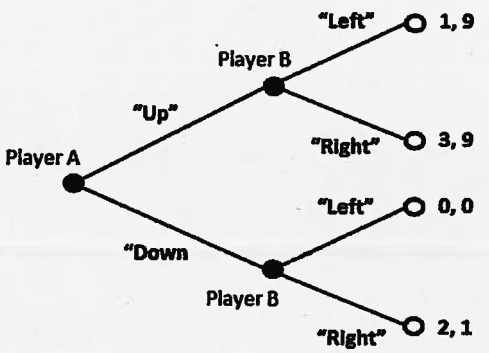
Econ 302
Tutorial 8 & 9

Please note that no answers for the tutorial questions will be distributed in hard copy or in electronic form. The tutor will be presenting the answers to these questions in class only.

1. Consider the following twist in the sequential game presented in class:



(a) Define the subgames in the above game. How many actions should a complete strategy of player A include? How many actions should a complete strategy of player B include?

(b) What is the Backwards Induction (BI) of this game? What is the Subgame Perfect Nash Equilibrium (SPNE) of this game? Do you have enough information to identify the SPNE? If no, suggest a way to resolve this problem.

2. Consider a general equilibrium model where there are two persons, A and B, and two goods, 1 and 2 (good 2 is the "numeraire," *i.e.*, its price can be normalized to unit once you find the equilibrium price ratio). Person A has 9 units of good 1 and 1 unit of good 2 while person B has 3 units of good 1 and 8 units of good 2. Person A's utility is represented by $U_A = \left(x_1^A\right)^{1/3}\left(x_2^A\right)^{2/3}$ and person B's utility is given by $U_B = \left(x_1^B\right)^{2/3}\left(x_2^B\right)^{1/3}$. The corresponding Marshallian demands are given by $x_1^A = (1/3)\left(m^A/p_1\right)$, $x_2^A = (2/3)\left(m^A/p_2\right)$, $x_1^B = (2/3)\left(m^B/p_1\right)$, and $x_2^B = (1/3)\left(m^B/p_2\right)$, where m^j is the income of person $j = A, B$.

(a) First examine if the following allocations are feasible or not:

- $x^A = (7,7)$ and $x^B = (5,4)$
- $x^A = (5,6)$ and $x^B = (7,3)$
- $x^A = (6,7)$ and $x^B = (5,2)$

(b) Find the marginal rates of substitution for both persons. Examine if the following allocations are Pareto efficient:

- $x^A = (7, 7)$ and $x^B = (5, 4)$
- $x^A = (5, 6)$ and $x^B = (7, 3)$
- $x^A = (6, 7)$ and $x^B = (5, 2)$

(c) Identify the income of each of the consumers and derive their gross demand functions.

(d) Derive their individual excess demand functions and the aggregate excess demands for the two goods.

(e) State Walras Law and use your findings in part *(d)* to verify it.

(f) Find the general equilibrium (*i.e.*, the equilibrium price ratio) and show your results graphically.

(g) Given the price ratio you found in part *(d)*, find the final allocation of goods (*Hint: you will have normalize the "numeraire" price before you proceed*). Prove that this allocation is Pareto efficient.