

**UNIVERSITY OF WISCONSIN**  
**Economics 101 – Spring 2007**  
**Professor Brown**  
**Problem Set 12**

**NOT TO BE TURNED IN**

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**Problem 1 - Game Theory**

		Player 2		
		l	m	r
Player 1	U	5, 3	0, 4	3, 5
	M	4, 0	5, 5	4, 0
	D	3, 5	0, 4	5, 3

- Find the Nash equilibria of the above game.
- Does either player have a dominant strategy?

**Problem 2 – Culture**

Give an example from a television show, book, or movie of a prisoners' dilemma. Do *not* use an example of the “classic” prisoners' dilemma that actually involves prisoners.

**Problem 3 – House Painters**

Arnold, Bob and Chester are neighbors. Each can paint his house white, brown or green. Each would prefer that all three houses be painted the same color, no matter what color it is.

However, IF the houses are *not* the same color, Arnold most prefers his house to be white, then brown, then green. Similarly, if the houses are not painted the same color, Bob's choice for his house is green, then brown then white. Chester likes his house to be green and brown equally well, but does not like white.

- Is it a Nash Equilibrium for Arnold, Bob and Chester to all paint their houses green? If not, explain who wants to deviate and how.
- Is it a Nash Equilibrium for Arnold to paint his house white and Bob and Chester to paint their houses green? If not, explain who wants to deviate and how.
- Is it a Nash Equilibrium for Arnold to paint his house white, Bob to paint house green and Chester to paint his house brown? If not, explain who wants to deviate and how.
- Is it a Nash Equilibrium for Arnold to paint his house white, Bob to paint his house brown, and Chester to paint his house green? If not, explain who wants to deviate and how.

**Problem 4 – Negotiation and Choice**

Two oligopoly firms, “micro” and “macro” produce economics books. They hold meetings in which they attempt to negotiate and decide on prices. Firm “micro” can send Alice (A) or Bob (B) to the negotiations. Firm “macro” can send Roderick (R) or Susan (S). Some of them are better negotiators than others. Further, some pairs seem to get along and can reach better negotiations. The chart below shows payoffs to the firms for all possible pairs of negotiators.

		Firm “macro”	
		R	S
Firm “micro”	A	2, 2	0, 1
	B	1, 4	0, 3

a. Compute the Nash Equilibrium of the game. Who does each firm send to the negotiations? What is each firm’s payoff?

Firm “micro” hires Covington (C). Covington is a ruthless negotiator and very effective against Roderick. However, Susan won’t budge. Notice that the new game is exactly identical to the original one except that firm “micro” now has a third choice. The original pairs would reach the same negotiations as they always did.

		Firm “macro”	
		R	S
Firm “micro”	A	2, 2	0, 1
	B	1, 4	0, 3
	C	3, 0	1, 1

b. Compute the Nash Equilibrium of the new game. Who does each firm send to the negotiations? What is each firm’s payoff?

c. The comment is sometimes made in economics that giving an agent more choices never make him worse off. At the very least, the agent could just stick to whatever he made originally. Is this true? Comment with reference to the situation above.