Homework 2

due 2/8/2011

Problem 1 MWG question 8.B.3

Problem 2 A newspaper runs the following contest: Each participant mails in a postcard on which he writes an integer between 0 and 1000 (inclusive). Given the entries, the *target integer* is defined to be $\frac{9}{10}$ times the highest entry, rounding downward if the result is not an integer. All participants who chose the target integer split a $10,000 prize.

Suppose this contest is modeled as a simultaneous move game among 100 players. Using a solution concept developed in this course, determine a unique prediction of play. State the weakest possible assumptions about the players' knowledge and abilities which would justify your prediction.

Problem 3 MWG question 8.D.4

Problem 4 MWG question 8.C.4

Problem 5 Compute all Nash equilibria of the reduced normal form of the game in Figure 1 of HW1.

Problem 6 In normal form game $G = I, \{S_i\}_{i \in N}, \{u_i\}_{i \in N}\}$, can a strategy which places positive probability on more than one pure strategy be strictly dominant? Provide an example, or prove as rigorously as you are able that this cannot occur.

Problem 7 Consider the following game:

		2	
		g	b
1	G	$3,3$	$0,5$
	B	$5,0$	$-4,-4$

a. Draw a picture of the best response correspondences $b_1 : \Sigma_2 \Rightarrow \Sigma_1$ and $b_2 : \Sigma_1 \Rightarrow \Sigma_2$. (Hint: when Σ_2 contains three pure strategies, the domain of b_1 can be represented by an equilateral triangle. What is the anaolgue for two pure strategies?)

b. Find all Nash equilibria of this game.

Problem 8 Compute all Nash equilibria of the symmetric normal form game below. (Hint: begin by drawing the best response correspondence $b_1 : \Sigma_2 \Rightarrow \Sigma_1$. Do not skip this step.)

		2		
		L	C	R
	T	$0,0$	$6,-3$	$-4,-1$
1	M	$-3,6$	$0,0$	$5,3$
	B	$-1,-4$	$3,5$	$0,0$

Optional question for personal enrichment A town has 100 voters: 51 conservatives and 49 liberals. A conservative and a liberal candidate are running for mayor. Voting is by simple majority, and in the case of a tie assume the liberal candidate wins. A conservative voter gets a payoff of 10 if the conservative candidate is elected and -10 if the liberal is elected; vice versa for a liberal voter. It costs a citizen 1 to vote.

Solve for the Nash equilibrium of this game. If you cannot explicitly solve the model, equations characterizing the equilibrium are good as well. Let me know if you get a good answer.