Econ. C103 McFadden

PROBLEM SET 8 (due Nov. 14)

The following problems are from Jehle-Reny, Exercise 7.4:

1. #7.4

2. #7.10(b,c)

3. #7.18

4. Each of two players, $i = 1,2$, announces a claim $a_i \in [0,100]$. If $a_1 + a_2 \leq 100$, then each player receives a payoff u_i equal his claim. If $a_1 + a_2 > 100$, then player 1 receives $u_1 = a_1$ if $a_1 < a_2$, $u_1 = 50$ if $a_1 = a_2$, and $u_1 = 100\text{-}a_2$ if $a_1 > a_2$, while player 2 receives $u_2 = 100 - u_1$. Show that the optimal reaction function for player 1 is $a_1^*(a_2) = \max\{a_2\text{-}\varepsilon,100\text{-}a_2\}$, where ε is a tiny number, say one cent, and that the optimal reaction function for player 2 is $a_2^*(a_1) = \max\{a_1\text{-}\varepsilon,a_1\}$. Show that the claims (50,50) where these reaction curves cross is a Nash equilibrium.

5. Consider the extensive game to the right. Show that if player 2 could "commit" to playing L if 1 plays A, then B is a Nash Equilibrium. However, this is not credible, since once A is played, the dominant strategy for 2 is to play R. Hence, show that (A,R) is a subgame-perfect Nash Equilibrium.