

EC403 Game Theory
Summer Term, Session 1, 2008
Problem Set 3
Instructor: Antonio Miralles
To be corrected in class on Thursday, June 19.

1) RECOMMENDATION LETTERS. A BU professor has several BU undergraduate students that want to go to Princeton and undertake the Ph.D. in Economics program there. Each student has asked the professor for a recommendation letter. The Admission Committee at Princeton wants students that are expected to hold a GPA above 3.25 throughout the program courses. The expected GPA during those courses for a student from BU that applies to Princeton is 3.10. But the expected GPA for the *best* BU student that applies to Princeton is 3.26. The *second best* BU student is expected to hold a 3.22 GPA. Other *lower-ranked* BU students applying to Princeton are expected to hold lower GPAs. Both the Committee and the BU professor know these expectations. The professor's payoff is equal to the number of BU students that get accepted at Princeton. What do you think the BU professor should do?

2) THE ELECTRICIAN. Do Exercise 4 in Chapter 9 of the textbook (page 296).

3) AN AUCTION WITH THREE BIDDERS. A unique, indivisible object is to be sold in an auction. There are three bidders $i=1,2,3$. Each bidder i has a private valuation v_i for the object. Other bidders just know that bidder i 's valuation is distributed uniformly between 0 and 1 ($\text{Prob}(v_i < v) = \text{Prob}(v_i \leq v) = v$). Verify that the Bayesian Equilibrium of this game is characterized by the following bid function, for any bidder i : $b_i(v_i) = 2v_i/3$.

4) BARGAINING WITH RESERVATION UTILITY. A sister and a brother bargain over a cake. They take turns in making offers, the sister going first. For each offer that is rejected, their parents take 5% of the whole cake away. If there is only half of the cake remaining, then their parents stop the game and give one quarter of the cake to each sibling. Determine the equilibrium path of this game.