Homework #1—Due Wednesday January 18

Directions: Answer all questions, and be neat. If you discuss the questions in study groups, list the members of your study group, and make sure that the writeup is your own work.

4. Consider a first-price auction with two players. The player with the highest bid wins the object and pays his/her bid. Letting $v_i$ denote the object’s value to player $i$ and letting $b_i$ denote player $i$’s bid, the payoffs are

$$u_i = v_i - b_i \text{ if } b_i > b_{-i}$$
$$u_i = \frac{v_i - b_i}{2} \text{ if } b_i = b_{-i}$$
$$u_i = 0 \text{ if } b_i < b_{-i}.$$ (a) If we have $v_1 = 1$ and $v_2 = 2$, show that there are no pure strategy Nash equilibria.
(b) If we have $v_1 = 1$ and $v_2 = 2$, construct a Nash equilibrium in which at least one player uses a mixed strategy.
5. For the “chicken” game of Figure 47.1, find the correlated equilibrium for which the sum of the payoffs of the two players is the highest.