All Syracuse University policies and procedures concerning academic honesty apply to this course:

"Syracuse University students shall exhibit honesty in all academic endeavors. Cheating in any form is not tolerated, nor is assisting another person to cheat. The submission of any work by a student is taken as a guarantee that the thoughts and expressions in it are the student's own except when properly credited to another. Violations of this principle include: giving or receiving aid in an exam or where otherwise prohibited, fraud, plagiarism, the falsification or forgery of any record, or any other deceptive act in connection with academic work. Plagiarism is the representation of another's words, ideas, programs, formulae, opinions, or other products of work as one's own either overtly or by failing to attribute them to their true source." (Section 1.0, University Rules and Regulations)

WARNING!!!

While homework problems may have been done cooperatively, exams are individual work. Do not communicate about this exam with anyone except the instructor [x3-2345 or e-mail jskelly@maxwell.syr.edu]. Violation of this rule will result in a grade of 0 for the exam. Any notices will be sent to you by e-mail; check occasionally.

EXPLAIN your answers carefully.

DUE: 9:30 am, Thursday, February 17, in class.
EXPLAIN your answers carefully. DUE: 9:30 am, Thursday, February 17, in class. The four problems are each worth 25 points.

1. Players 1 and 2 may split a million dollars. Both players simultaneously name shares, $s_1$ and $s_2$, with $0 \leq s_1 \leq 1$ and $0 \leq s_2 \leq 1$. If $s_1 + s_2 \leq 1$, then the players receive the share the other person named. If $s_1 + s_2 > 1$, then both players receive zero. (Utilities are linear in money.)

Are there any Nash equilibria? If so, what are they?

2. Consider a simultaneous bidding game for an object that the two bidders value differently. Bidder i’s valuation is $v_i$ (a positive integer), and we assume $v_2 - v_1 \geq 2$. The rules are that each player submits a bid $b_i$, (a non-negative integer) in a sealed envelope. The envelopes are then opened, and the bidder who has submitted the highest bid gets the object but pays the amount of that highest bid, so the payoff is $v_i - b_i$. If both bidders submit the highest bid, each gets the object with probability $1/2$, so the payoff is $(v_i - b_i)/2$. Bids must be in (integer) dollar multiples.

Are there any Nash equilibria? If so, what are they?

Are there ever Nash equilibria where both players bid their true valuation?

Are there ever Nash equilibria where bidder #2 gets a positive payoff?

3. Analyze a modified centipede game, where it takes two stop (down) decisions to end the game early. After a first stop, the game continues just as the original centipede game did. [See the last page.]

What are the subgame perfect NE?
Does there exist a NE that is not subgame perfect?

4. For the game form shown on the next page, find all weak perfect Bayesian equilibria. [Whether or not a WPBE exists may vary with the value of $x$. When equilibria do exist, uniqueness may depend on $x$. The equilibrium profiles and belief structure may depend on $x$.]

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