

Homework 4—Due April 2, 2009

1. Find a correlated equilibrium of the following three-person game, where player 1 picks a row, player 2 picks a column, and player 3 picks a matrix.

	<i>L</i>	<i>R</i>		<i>L</i>	<i>R</i>		<i>L</i>	<i>R</i>
<i>U</i>	2, 2, 3	0, 0, 8	<i>U</i>	2, 2, 2	0, 0, 0	<i>U</i>	2, 2, 0	0, 0, 0
<i>D</i>	0, 0, 0	2, 2, 0	<i>D</i>	0, 0, 0	2, 2, 2	<i>D</i>	0, 0, 8	2, 2, 3
	<i>A</i>			<i>B</i>			<i>C</i>	

2. Consider the following game.

	<i>L</i>	<i>R</i>
<i>U</i>	4, 4	1, 6
<i>D</i>	6, 1	−3, −3

- (a) Find a correlated equilibrium that maximizes the expected sum of both players' payoffs. Is it the unique maximizing equilibrium?
- (b) Find a correlated equilibrium that minimizes the expected sum of both players' payoffs. Is it the unique minimizing equilibrium?
3. Consider the following game.

	<i>L</i>	<i>C</i>	<i>R</i>
<i>U</i>	0, 0	5, 4	4, 5
<i>M</i>	4, 5	0, 0	5, 4
<i>D</i>	5, 4	4, 5	0, 0

- (a) Find a Nash equilibrium of this game with the property that each player's expected payoff is 3. Are there any other Nash equilibria?
- (b) Show that this game has a correlated equilibrium in which both players' expected payoffs are strictly larger than 4.
- (c) Find a correlated equilibrium that maximizes the expected payoff of player 1. Is it the unique maximizing equilibrium?