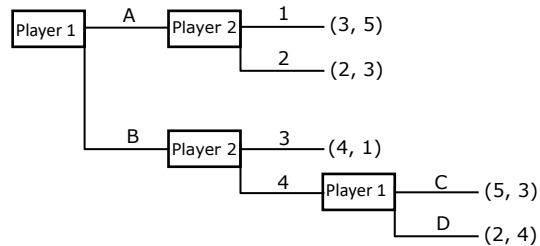


Math 315 Homework 5

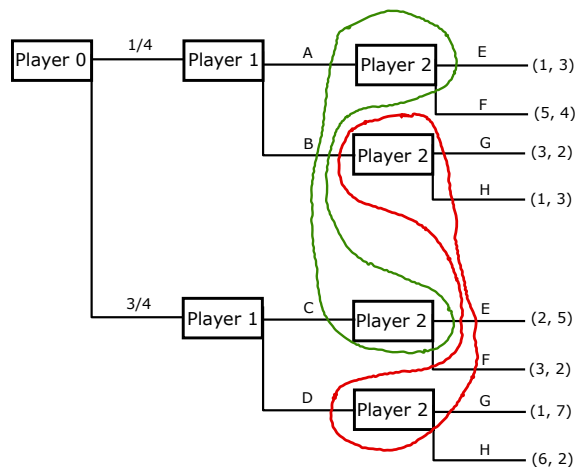
Due Friday, March 10

Solutions must be written in \LaTeX . You are encouraged to work with others on the assignment, but you should write up your own solutions independently. You should reference all of your sources, including your collaborators.

1. Consider the extensive-form game given by the following game tree:



- (a) Use backward induction to determine each player's optimal strategy. What happens when each player uses their optimal strategy?
 - (b) Identify all of Player 1's strategies and all of Player 2's strategies. Write this game in strategic form.
 - (c) Find all of the pure strategy Nash Equilibria in the strategic form game.
2. Consider the extensive-form game given by the following game tree. Player 0 is Nature, and the game has two information sets as indicated in the game tree.



Identify all of Player 1's strategies and all of Player 2's strategies. Write this game in strategic form.

3. Consider the following strategic-form game:

		Player 2				
		1	2	3	4	5
Player 1	A	2, -1	2, 0	-5, -1	0, 0	1, -1
	B	2, 2	3, 3	-4, 3	1, 3	1, -2
	C	1, -1	-2, 2	-5, 4	0, 4	-1, 3

- (a) Remove any rows or columns that are strictly dominated, and repeat until no strictly dominated rows or columns remain. What is the resulting matrix after all strictly dominated strategies have been removed?
- (b) Find all pure strategy Nash equilibria in the game?
4. Considered a simplified baseball game in which the pitcher chooses whether to throw a fastball or a curve ball, and the batter chooses whether to anticipate a fastball or curve ball. Suppose that this is represented by the following strategic-form game:

		Batter	
		Anticipate Fastball	Anticipate Curve
Pitcher	Throw Fastball	70, 30	80, 20
	Throw Curve	85, 15	65, 35

- (a) Does this game have any pure strategy Nash equilibria?
- (b) Find the mixed strategy Nash equilibrium for the game.
- (c) What is batter's expected payoff if both players are using the mixed strategy Nash equilibrium? What is the pitcher's expected payoff if both players are using the mixed strategy Nash equilibrium?