14.12 Game Theory
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Homework 2

Due on 10/7/2002 (in class)

1. Consider the following game:

1\2	L	R
T	(1, 1)	(1, 0)
B	(0, 1)	(0, 10000)

   (a) Compute the rationalizable strategies.

   (b) Now assume that players can tremble: when a player intends to play a strategy s, with probability $\epsilon = 0.001$, nature switch to the other strategy s', when s' is played. For instance, if player 2 plays L (or intends to play L), with probability $1 - \epsilon$ L is played, with probability ϵ, R is played. Compute the rationalizable strategies for this new game.

   (c) Discuss your results (briefly).

2. Compute all the Nash equilibria of the following game.

	L	M	R
A	(4, 3)	(0, 0)	(1, 1)
B	(0, 1)	(1, 0)	(10, 0)
C	(0, 0)	(3, 4)	(1, 1)
D	(-1,0)	(3,1)	(5,0)

3. A group of n students go to a restaurant. It is common knowledge that each student will simultaneously choose his own meal, but all students will share the total bill equally. If a student gets a meal of price p and contributes x towards paying the bill, his payoff will be $\sqrt{p} - x$. Compute the Nash equilibrium. Discuss the limiting cases $n = 1$ and $n \to \infty$.

4. Apply backwards induction in the game of Figure 1.

5. Compute two subgame-perfect equilibria in the game of Figure 2.

6. Three gangsters armed with pistols, Al, Bob, and Curly, are in a room with a suitcase of money. Al, Bob, and Curly have 20%, 40% and 70% chances of killing their target, respectively. Each has one bullet. First Al shoots targeting one of the other two gangster. After Al, if alive, Bob shoots, targeting one of the surviving gangsters. Finally, if alive, Curly shoots, targeting again one of the surviving gangsters. The survivors split the money equally. Find a subgame-perfect equilibrium.

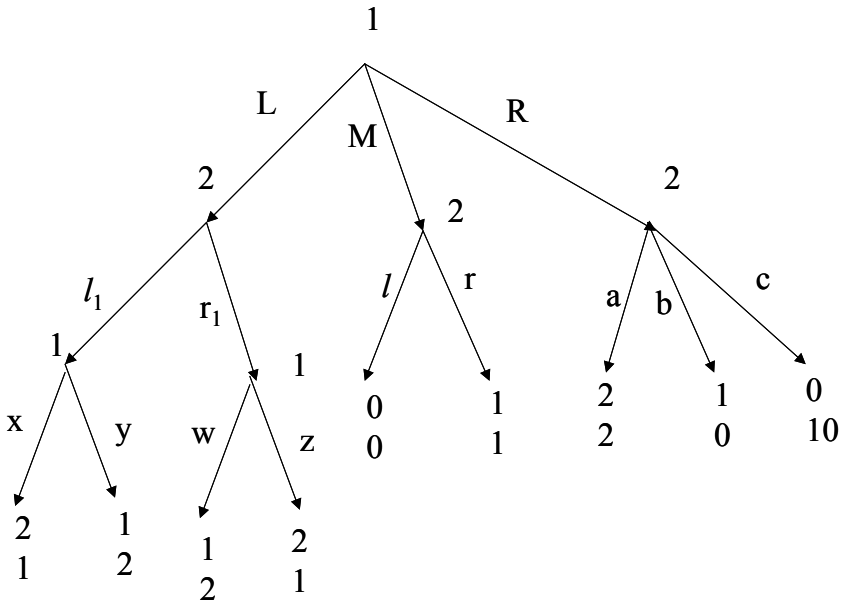

Figure 1:

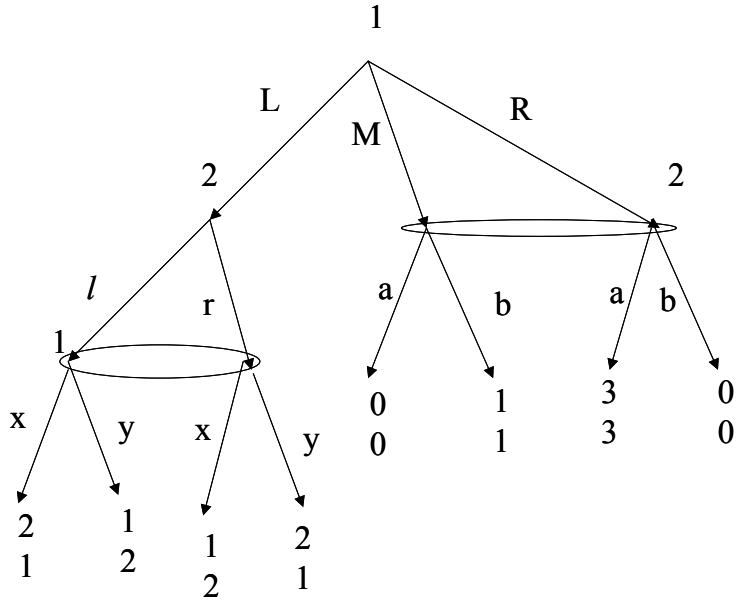

Figure 2: