Introduction to Game Theory

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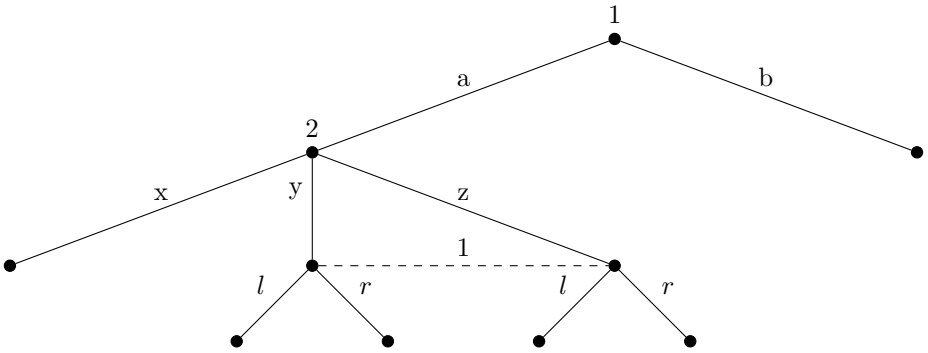
Exercise Sheet 6

Due: Friday, June 26, 2020

Exercise 6.1 (Imperfect Information Games, 1+1+1+2 points)
Consider the following extensive form game with imperfect information:



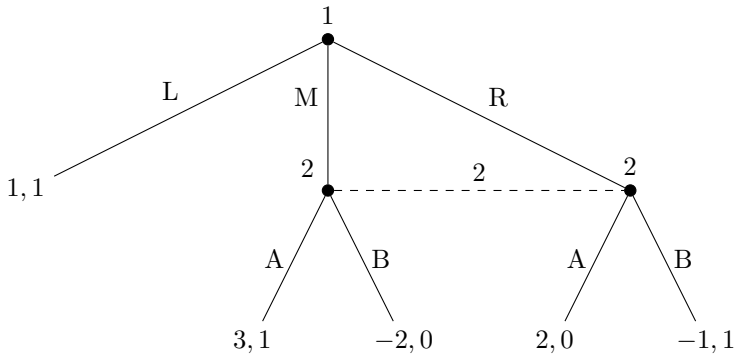
(a) Is this a game of perfect or imperfect recall? Justify your answer.

(b) Specify the information partition $\mathcal{I}_i$ for player 1 and 2.

(c) Specify player 1's experience record of the following histories: $\langle a, x\rangle, \langle a, y, l\rangle, \langle a, z, r\rangle$

(d) Find the behavioral strategy of player 1 that is outcome-equivalent to her mixed strategy in which she plays (b, r) with probability 0.4, (b, l) with probability 0.1, and (a, l) with probability 0.5.

Exercise 6.2 (Sequential equilibria, 3 points)
Consider the following imperfect information game:



Find the set of sequential equilibria of this game. (Hint: There are three types of sequential equilibria:

(a) $\beta_1(\langle\rangle)(L) = 1,\ x \leq \beta_2(\{\langle M\rangle, \langle R\rangle\})(B) \leq y,\ \mu(\langle M\rangle) = \mu(\langle R\rangle) = \frac{1}{2}$

(b) $\beta_1(\langle\rangle)(L) = 1,\ \beta_2(\{\langle M\rangle, \langle R\rangle\})(B) = 1,\ x' \leq \mu(\langle R\rangle) \leq y'$

(c) $\beta_1(\langle\rangle)(M) = 1,\ \beta_2(\{\langle M\rangle, \langle R\rangle\})(A) = z,\ \mu(\langle M\rangle) = 1$

Find values of x, y, x', y', and z such that this list covers all sequential equilibria and only those.)