Exercise sheet 6

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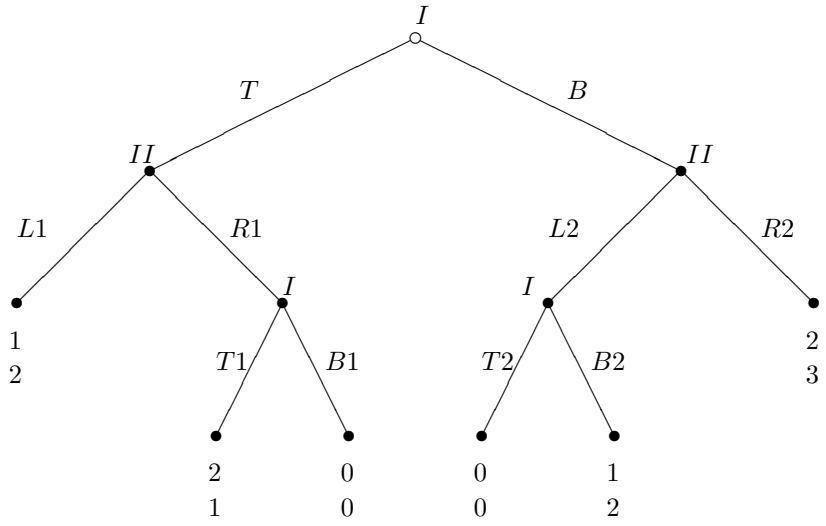
Game Theory, Fall 2015

Exercise 1:

Apply the backward induction to the following game in extensive form:



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Exercise 2: The Centipede Game

Consider the following game in extensive form :

- At stage 1, player 1 chooses between R and D.
  - If he chooses D, player 1 gets 1 and player 2 gets 0;
  - If he chooses R, the game moves to the second round.
- At stage 2, player 2 chooses between r and d.
  - If he chooses d, player 1 gets 0 and player 2 gets 2;
  - If he chooses r, the game moves to the second round.
- At stage 3, player 1 chooses between R and D.
  - If he chooses D, player 1 gets 3 and player 2 gets 1;
  - If he chooses R, the game moves to the second round.

- At stage 4, player 2 chooses between r and d.
  - If he chooses d, player 1 gets 2 and player 2 gets 4;
  - If he chooses R, both players get 3.

1. Draw the tree representation of the game.
2. What is the outcome predicted by backward induction?
3. Give the pure strategies of both players and the payoff matrix of the normal form of the game.
4. Find all Nash equilibria. Which ones are sub-game perfect?