

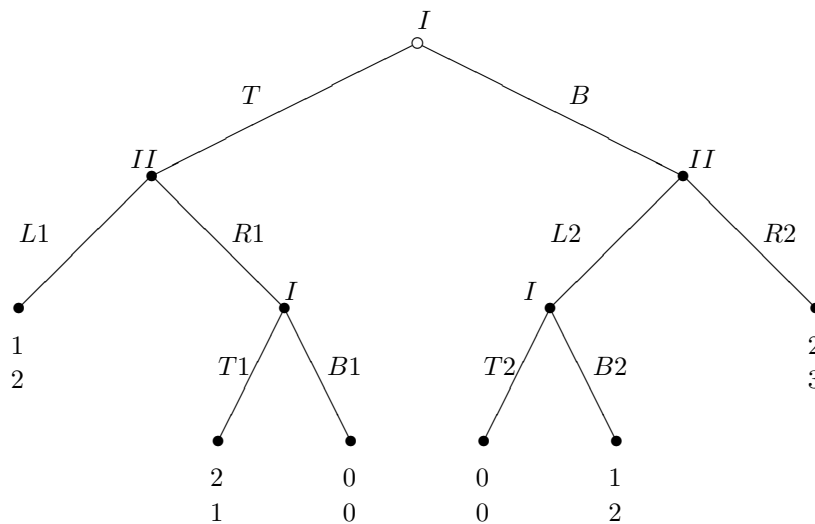
Exercise sheet 6

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Exercise 1:

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



Answer: Applying the backward induction we have that the solution of the game is given by: I plays BT_1B_2 and II plays L_1R_2 .

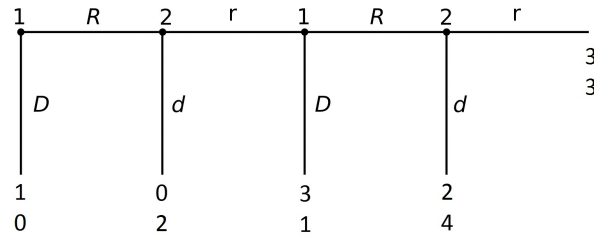
Exercise 2: The Centipede Game

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.

Answer:



2. What is the outcome predicted by backward induction?

Answer: (DD,dd)

3. Give the pure strategies of both players and the payoff matrix of the normal form of the game.

Answer: Player 1: DD, DR, RD, RR, Player 2: dd, dr, rd, rr

	dd	dr	rd	rr
DD	1, 0	1, 0	1, 0	1, 0
DR	1, 0	1, 0	1, 0	1, 0
RD	0, 2	0, 2	3, 1	3, 1
RD	0, 2	0, 2	2, 4	3, 3

4. Find all Nash equilibria. Which ones are sub-game perfect?

Answer: The Nash equilibria are: (DD,dd), (DD,dr), (DR,dd) and (DR,dr)

The only sub-game perfect is (DD,dd)