Urban Economics and Simulations

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Exercises B

Exercise 1 *The following true/false questions deal with a general bimatrix game.*

a. A bimatrix game concerns a game with two players.

b. Each bimatrix game has at least one Nash equilibrium.

c. Each bimatrix game has a social optimum.

Exercise 2 *The following true/false questions deal with the bimatrix game*

$$\begin{pmatrix} 3;6 & 6;5 & 4;3 \\ 6;2 & 5;3 & 5;4 \end{pmatrix}.$$

a. The row-player has 2 *strategies.*

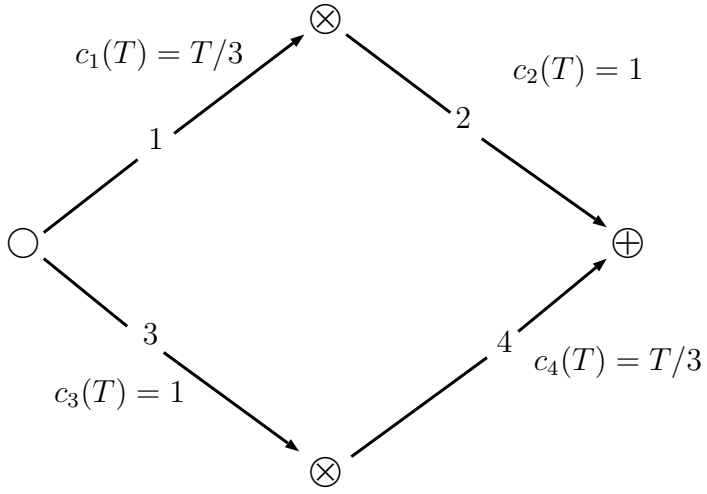
b. There are 6 *strategy profiles.*

c. Playing row 1 *and column* 1 *is a Nash equilibrium.*

d. Playing row 1 *and column* 3 *is a social optimum.*

e. This game is a zero-sum game.

Exercise 3 *Consider the following variant of the traffic network with two commuters presented in the context of the Braess' paradox in Slides B.*

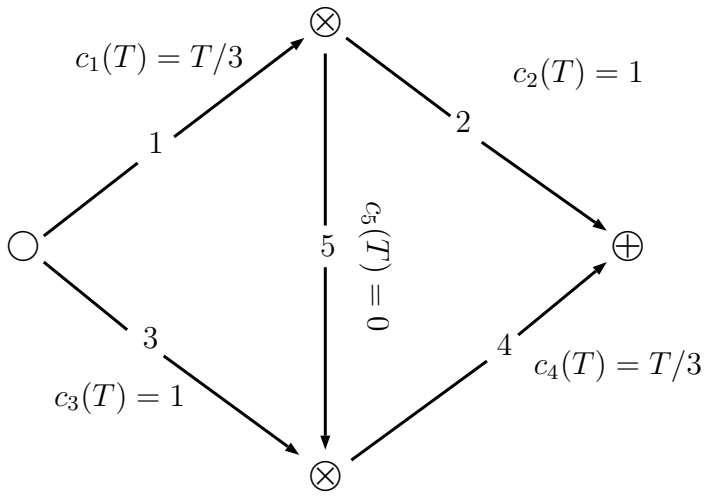


a. *Identify for each commuter the strategies.*

b. *Represent this game as a bimatrix game.*

c. *Determine the Nash equilibria.*

Exercise 4 *Modify the above traffic network by adding as follows a fifth route that can be used without costs.*



d. *Identify for each commuter the strategies.*

e. *Represent this game as a bimatrix game.*

f. *Determine the Nash equilibria.*

g. *Compare with parts c and d in Exercise 3.*