

Algorithmic game theory – Tutorial 3*

October 31, 2022

1 The Lemke–Howson algorithm

Exercise 1. Use the Lemke–Howson algorithm and compute a Nash equilibrium of the following bimatrix game

$$M = \begin{pmatrix} 0 & 6 \\ 2 & 5 \\ 3 & 3 \end{pmatrix} \quad \text{and} \quad N = \begin{pmatrix} 1 & 0 \\ 0 & 2 \\ 4 & 3 \end{pmatrix}.$$

Start the computation by choosing the label 2.

Exercise 2. Show that the Lemke–Howson algorithm does not terminate in a vertex of the form $(x, \mathbf{0})$ or $(\mathbf{0}, y)$ in the configuration graph.

Exercise 3. Prove that if (s_1, s_2) and (s'_1, s'_2) are mixed Nash equilibria of a two-player zero-sum game, then so are (s_1, s'_2) and (s'_1, s_2) .

*Information about the course can be found at <http://kam.mff.cuni.cz/~balko/>