Algorithmic game theory – Tutorial 2*

1 The Lemke–Howson algorithm

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

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

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).*