## Homework 1 – Part 2

## CSCE689 Algorithmic Game Theory

## September 6, 2023

- 1. Consider the matching pennies game in Fig 1.
  - (a) Determine a mixed strategy Nash equilibrium by executing the Lemke-Howson algorithm. Graphically construct the strategy simplicies, and label each vertex. Then, show the path the algorithm takes.
  - (b) Execute the algorithm again, this time by following the algebraic manipulations of the pseudocode shown in class. Show each iteration, which variable enters, which one leaves, etc.
- 2. Show that in two-player games the maxmin value of a player is equal to the player's minmax value.
- 3. Show that in *n*-player games the maxmin value of a player is at most the player's minmax value.

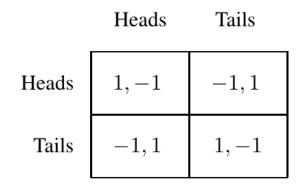


Figure 3.6: Matching Pennies game.

Figure 1: