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.

	Heads	Tails
Heads	$1, -1$	$-1, 1$
Tails	$-1, 1$	$1, -1$

Figure 3.6: Matching Pennies game.

Figure 1: