Algorithmic Game Theory, Assignment 1

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1.1

1.2

Assuming Player I has a strategy $(\frac{1}{2}, \frac{1}{2})$, the payoff for Player II if they chose B would be $\frac{1}{2} \cdot a + \frac{1}{2} \cdot c$, and the payoff if they chose A is 0.

Therefore, for Player II to always prefer A over B,

$$\frac{1}{2} \cdot a + \frac{1}{2} \cdot c < 0$$

$$\Rightarrow a + c < 0$$

1.3

Let $a, b, c, d = 0$. Then for either player, a strategy $(\lambda, 1 - \lambda)$ for any $\lambda \in [0, 1]$, the payoff is 0, and there are infinitely many such λ's.