Next generation consoles and an introduction to normal form games

Game Theory

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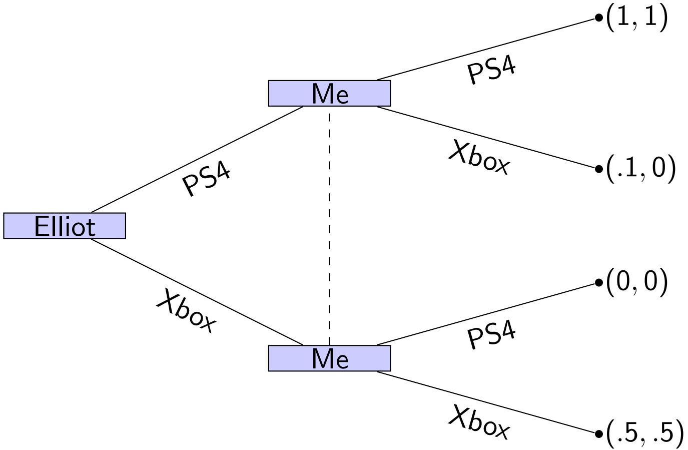
Elliot
PS4
Xbox
Me
Me
PS4
Xbox
PS4
Xbox
(1, 1)
(.1, 0)
(0, 0)
(.5, .5)

- A finite set of N players: Elliot and I.
- Strategy spaces for the players: $S_1, S_2, S_3, \dots S_N$ - $S_1 = S_2 = \{\text{Xbox}, \text{PS4}\}$.
- Payoff functions for the players: $u_i : S_1 \times S_2 \cdots \times S_N \to \mathbb{R}$

$$\begin{pmatrix} (.5, .5) & (.1, 0) \\ (0, 0) & (1, 1) \end{pmatrix}$$

Mixed strategy: σ_i

$$\sum_{i=1}^{|S_i|} \sigma_i = 1$$

$$\sigma_1 = (.3, .7) \text{ and } \sigma_2 = (.8, .2)$$

$$\begin{pmatrix} (.5,.5) & (.1,0) \\ (0,0) & (1,1) \end{pmatrix}$$

$$\begin{aligned} u_1(\sigma_1,\sigma_2) &= \sum_{r\in S_1, s\in S_2} \sigma_1(r)\sigma_2(s)u_1(r,s) \\ &= .3\times .8\times .5 + .3\times .2\times 0 + .7\times .8\times .1 + .7\times .2\times 1 = .19 \\ u_1(\sigma_1,\sigma_2) &= \sum_{r\in S_1, s\in S_2} \sigma_1(r)\sigma_2(s)u_2(r,s) \\ &= .3\times .8\times .5 + .3\times .2\times 0 + .7\times .8\times 0 + .7\times .2\times 1 = .134 \end{aligned}$$

What happens when **I** ‘always’ buy a PS4?