Nash Equilibria in Mixed Strategies

Game Theory

Vincent Knight

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

T

T

T

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

T

T-T

H

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

T

T-T-H

H

H

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

T-T-H-H

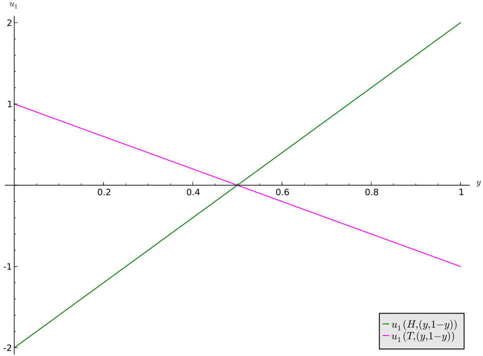
H T

$$\begin{pmatrix} (2,-2) & (-2,2) \\ (-1,1) & (1,-1) \end{pmatrix}$$

T-T-H-H-T

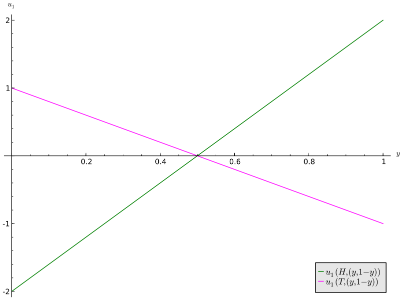
$$u_1(H, \sigma_2) = 2y - 2(1-y) = 4y - 2$$
$$u_1(T, \sigma_2) = -y + (1-y) = 1 - 2y$$

$$u_1(H, \sigma_2) = 2y - 2(1-y) = 4y - 2$$
$$u_1(T, \sigma_2) = -y + (1-y) = 1 - 2y$$



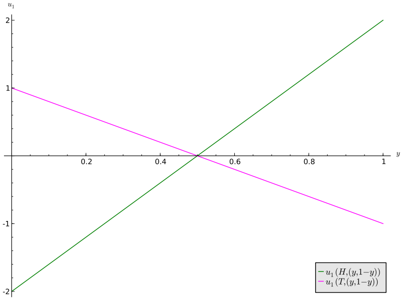
Row player:

$$s_1^* = \begin{cases} T, & \text{if } y < 1/2 \\ H, & \text{if } y > 1/2 \\ \text{Indifferent}, & \text{if } y = 1/2 \end{cases}$$



Row player:

$$s_1^* = \begin{cases} T \Leftrightarrow x = 0, & \text{if } y < 1/2 \\ H \Leftrightarrow x = 1, & \text{if } y > 1/2 \\ \text{Indifferent}, & \text{if } y = 1/2 \end{cases}$$



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Column player:

$$s_2^* = \begin{cases} H, & \text{if } x < 1/3 \\ T, & \text{if } x > 1/3 \\ \text{Indifferent}, & \text{if } x = 1/3 \end{cases}$$

Row player:

$$s_1^* = \begin{cases} T \Leftrightarrow x = 0, & \text{if } y < 1/2 \\ H \Leftrightarrow x = 1, & \text{if } y > 1/2 \\ \text{Indifferent}, & \text{if } y = 1/2 \end{cases}$$

Column player:

$$s_2^* = \begin{cases} H \Leftrightarrow y = 1, & \text{if } x < 1/3 \\ T \Leftrightarrow y = 0, & \text{if } x > 1/3 \\ \text{Indifferent}, & \text{if } x = 1/3 \end{cases}$$