Subject:

Year. Month. Date. ( )

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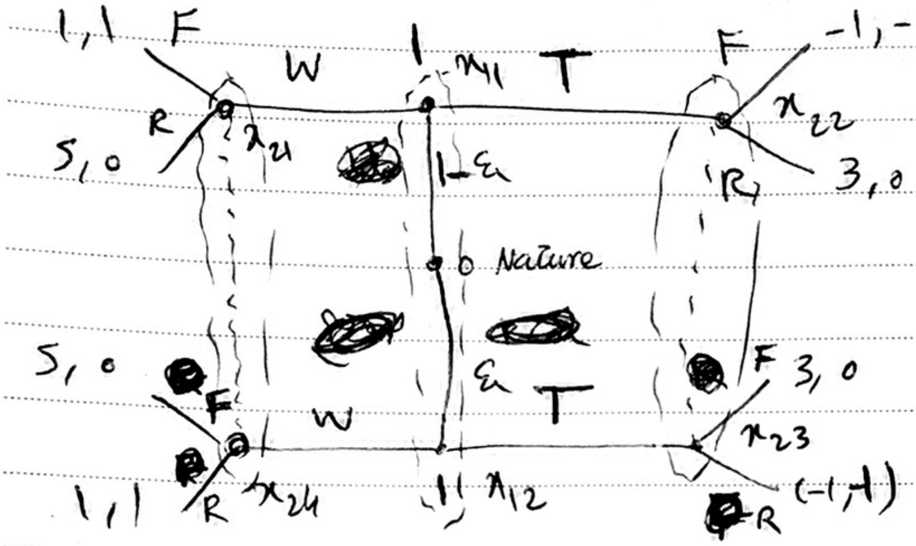

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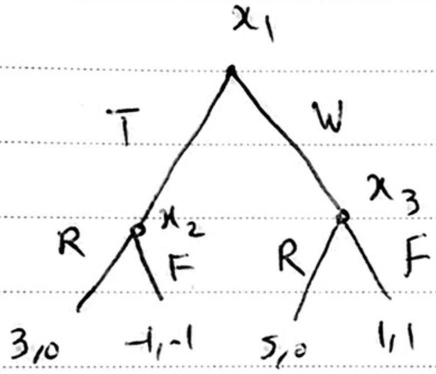

$SPE = (T, RF)$

$\cancel{\text{let } P(a_1 = T) = P_1}$

$\cancel{EU_2(F) = -1\times \varepsilon P_1 + 0 + 0 + 1\times \varepsilon \times (1-P_1)}$

$\cancel{EU_2(R) = 0 + (-1)\times(1-\varepsilon)\times P_1 + 0 + 1\times(1-\varepsilon)(1-P_1)}$

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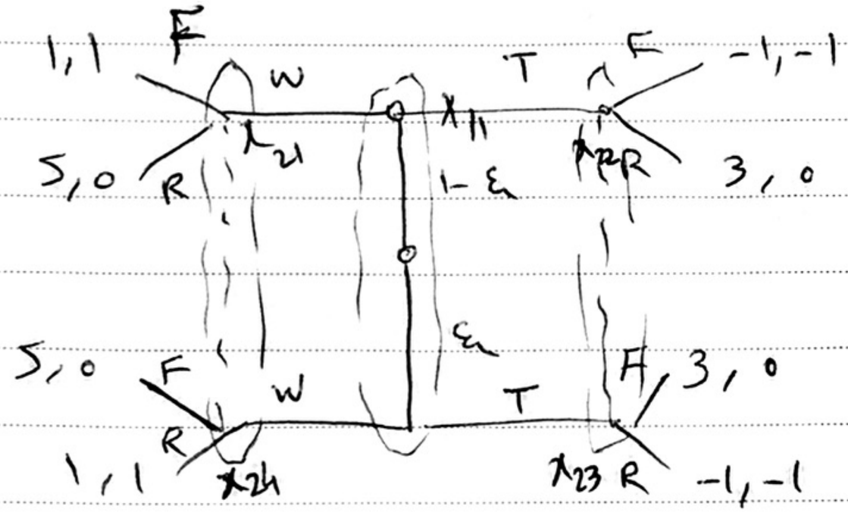

let $(a_1 = t) = p_1$

$$EU_2(F) = (1-\varepsilon_1) \times p_1 \times (-1) + 1 \times (1-\varepsilon_1) \times (1-p_1)$$

$$+ 0 + 0 = (1-\varepsilon_1)(1-2p_1)$$

$$EU_2(R) = 0 + 0 + \varepsilon_1(1-p_1) + (-1) \times \varepsilon_1 p_1$$

$$= \varepsilon_1(1-2p_1)$$

$$BR_2 = \begin{cases} R & p_1 > \frac{1}{2} \\ (F, R)(p_2, 1-p_2) & p_1 = \frac{1}{2} \\ F & p_1 < \frac{1}{2} \end{cases}$$

PAPCO

سؤال ۲

A \ B	C	D
C	$\frac{z}{2}, 1-\frac{z}{2}$	$z, 1-z$
D	$z, 1-z$	$\frac{z}{2}, 1-\frac{z}{2}$

$\Rightarrow$

A \ B	C	D
C	$\frac{x}{2}, 1-\frac{x}{2}$	$x, 1-x$
D	$1-x, x$	$\frac{1-x}{2}, 1-\frac{1-x}{2}$

If C is dominant for A

$$\left.\begin{array}{l} x > \frac{1-x}{2} \Rightarrow x > \frac{1}{3} \\ \frac{x}{2} > 1-x \Rightarrow x > \frac{2}{3} \end{array}\right\} \Rightarrow x > \frac{2}{3}$$

If D " for A

$$\left.\begin{array}{l} 1-x > \frac{x}{2} \Rightarrow x < \frac{2}{3} \\ \frac{1-x}{2} > x \Rightarrow x < \frac{1}{3} \end{array}\right\} \Rightarrow \cap : x < \frac{1}{3}$$

for B if C is optimal:

$x > 1 - \frac{(1-x)}{2} \Rightarrow 2x > 2-1+x \Rightarrow x > 1 \rightarrow$ امکان ندارد

$1-\frac{x}{2} > 1-x \Rightarrow x > 0$ ✓

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for B if D is dominant

$1-x > 1-\frac{x}{2} \Rightarrow x < 0$ غلط

$1-\frac{1-x}{2} > x \Rightarrow x < 1$ ← همیشه درست است

$\Rightarrow$ بازیکن B استراتژی strictly dominant ندارد.

برای A ، C غالب است اگر $x \geq \frac{2}{3}$

D غالب است اگر $x \leq \frac{1}{3}$

برای B : اگر $x=1$ C به طور ضعیف غالب است.

اگر $x=0$ آنگاه D به طور ضعیف غالب است.

(ج

		B: C	B: D
A	C	$\frac{x}{2}, 1-\frac{x}{2}$	$x, 1-x$
	D	$1-x, x$	$\frac{1-x}{2}, 1-\frac{1-x}{2}$

$$BR_A(C) = \begin{cases} C : \frac{x}{2} \geq 1-x \Rightarrow x > \frac{2}{3} \\ (P_1, 1-P_1).(C, D) \quad x = \frac{2}{3} \\ D \quad x < \frac{2}{3} \end{cases}$$

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$$BR_A(D) = \begin{cases} C & x > \frac{1}{3} \\ (P_1, 1-P_1)\cdot(C,D) & x = \frac{1}{3} \\ D & x < \frac{1}{3}, \ (x < \frac{1-x}{2} \to x < \frac{1}{3}) \end{cases}$$

$$BR_B(C) = \begin{cases} C & : 1-\frac{x}{2} > 1-x \Rightarrow x > 0 \\ (P_2, 1-P_2)\cdot(C,D) & x = 0 \\ D & x < 0 \end{cases}$$

$$BR_B(D) = \begin{cases} C & x > 1 \ (: x > 1 - \frac{\cancel{1}-x}{2} \Rightarrow x > 1) \\ (P_2, 1-P_2)\cdot(C,D) & x = 1 \\ D & x < 1 \end{cases}$$

pure Nash eq:

$(C,D) \equiv (x > \frac{1}{3}, x < 0)$ ✗

$(D,C) \equiv x < \frac{2}{3}, x > 1$ ✗

$(D,D) \equiv x < \frac{1}{3} \quad x < 1$ ✓ $\Rightarrow x < \frac{1}{3}$

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$(C,C) \equiv x > \frac{2}{3}, x > 0$ ✓ ۴ $\Rightarrow x > \frac{2}{3}$

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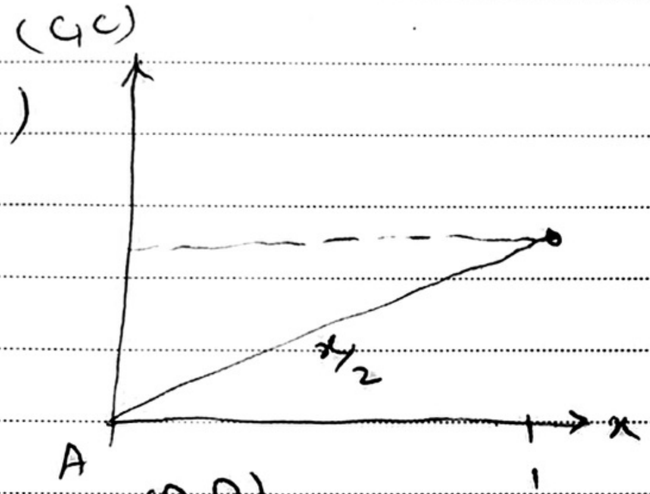
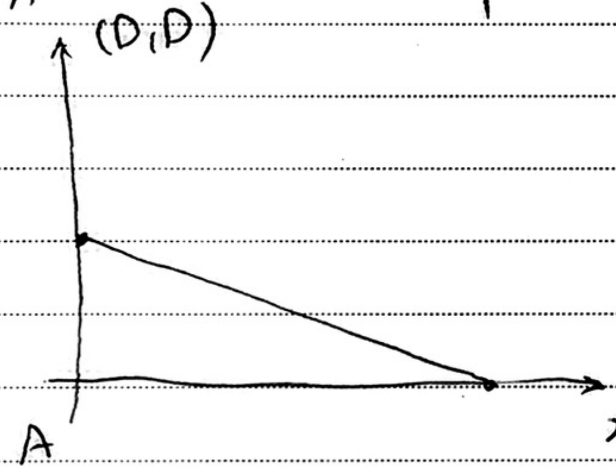
1) If A, Attacks with probability p_1 in C and $1-p_1$ in D

$$V_B(C) = (1-p)x + p\left(1-\frac{x}{2}\right) = p + x\left(1-\frac{3}{2}p\right)$$

$$V_B(D) = (1-p)\left(\frac{1+x}{2}\right) + p(1-x) = \frac{1}{2} + \frac{p}{2} + x\left(\frac{1}{2} - \frac{3}{2}p\right)$$

ب)





$\sigma_A = (p, 1-p).(C,D)$ $\quad \sigma_B \in \{C, D\}$