

Homework

Find Nash equilibrium(s).

		Bob		
		A	B	C
Alex	A	<u>8,7</u> > 7,10 < 5,4 ^	7, <u>10</u> < 5,4 ^	5,4 v
	B	0,3 > 5, <u>5</u> < <u>6</u> ,4 v	5, <u>5</u> < <u>6</u> ,4 ^	<u>6</u> ,4 ^
	C	2,5 > <u>4</u> ,2 > 3, <u>7</u> v	<u>4</u> ,2 > 3, <u>7</u> ^	3, <u>7</u> ^

Nash Eq: (A, B)

(Alex: A Bob: B, (7, 10))

Find the mixed strategy Nash equilibrium

- The Battle of Sex game
- Bob and Alice are lovers. They are now deciding what they are gonna do in the coming Sunday.
The choices are to go to the boxing game or shopping.
- Find all of pure NEs and mixed-strategy NEs.

		Anna	
		Boxing	Shopping
Tom	Boxing	$\underline{2}, \underline{1}$ \wedge	$0, 0$ \vee
	Shopping	$0, 0$ \succ	$\underline{1}, \underline{2}$

pure NE case: (Boxing, Boxing) ; (shopping, shopping)

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		Anna		
				p
			Boxing	Shopping
Tom	Boxing q	2, 1	0, 0	$2 \times p + 0 \times (1-p) = 2p$
	Shopping $1-q$	0, 0	1, 2	$0 \times p + 1 \times (1-p) = 1-p$
Anna's reward		$q \times 2 + (1-q) \times 0 = 2q$	$q \times 0 + (1-q) \times 1 = 1-q$	

if $2p > 1-p \Rightarrow p > \frac{1}{3}$, Tom better boxing

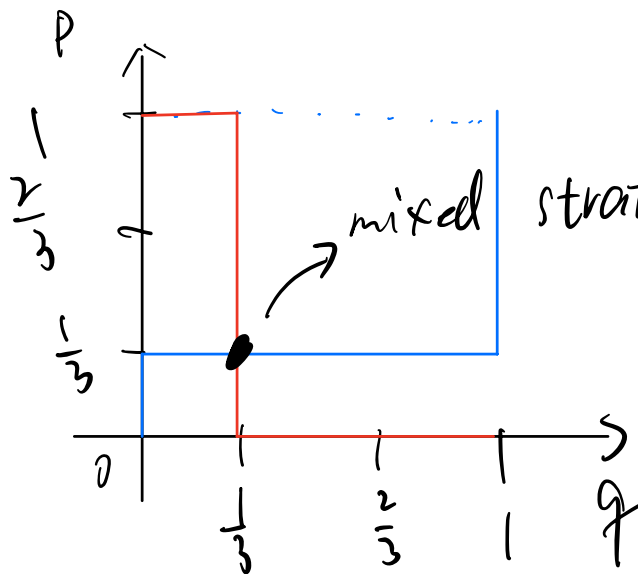
if $2p < 1-p \Rightarrow p < \frac{1}{3}$, Tom better shopping

if $2p = 1-p \Rightarrow p = \frac{1}{3}$, Tom randomizes.

if $2q > 1-q \Rightarrow q > \frac{1}{3}$, Anna better boxing

if $2q < 1-q \Rightarrow q < \frac{1}{3}$, Anna better shopping

if $2q = 1-q \Rightarrow q = \frac{1}{3}$, Anna randomizes.



0: shopping

1: boxing

strategy Nash Equilibrium.

$$(p, q) \Rightarrow \left(\frac{1}{3}, \frac{1}{3}\right)$$