Exercise sheet 5

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Game Theory, Fall 2016

Exercise 1:

Suppose that the pure strategy s^* is evolutionarily stable.

1. Is it possible that there is some other pure strategy that weakly dominates s^*?

   Answer: No. It is sufficient to write down the definition of weak domination for a strage s' and to show that this contradicts the fact that $s*$ is ES.

2. Is it possible that there is some other pure strategy that is not weakly dominated by s^*?

   Answer: Yes. See the next exercise.

Exercise 2:

Consider the following symmetric two-player game:

	a	b
a	$3,3$	$0,0$
b	$0,0$	$1,1$

1. Find all the symmetric Nash equilibria, including any mixed-strategy equilibria.

   Answer: (a,a)**,** (b,b) **and** $\left(\left(\frac{1}{4},\frac{3}{4}\right),\left(\frac{1}{4},\frac{3}{4}\right)\right)$.

2. Find all the evolutionarily stable strategies, including any mixed-strategy ESS.

   Answer: (a,a)**,** (b,b) **are ES, while** $\left(\left(\frac{1}{4},\frac{3}{4}\right),\left(\frac{1}{4},\frac{3}{4}\right)\right)$ **is not.**