Lecture 5 — 19 Sept. 07

« Concepts: Dominance, Best Response, Nash Equilibria »

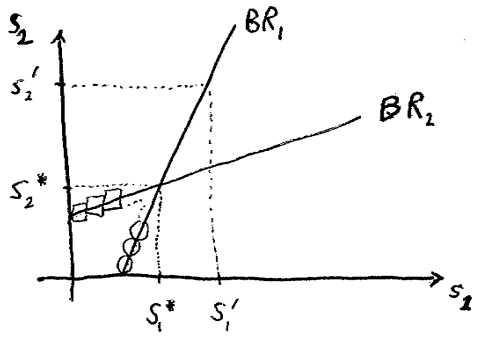
Last time – Nash Equilibrium

Defn A strategy profile $(s_1^*, s_2^*, \dots, s_N^*)$ is a **NE** if, for each i, her choice s_i^* is a best response to the other players' choices s_{-i}^*

Motivations (1) no regrets

no individual can do strictly better by deviating, holding others fixed

(2) self-fulfilling beliefs



Relate NE to Dominance

1 \ 2	α	β
α	(0,0)	(3,-1)
β	(-1,3)	(1,1)

β is strictly dominated by α

NE is (α, α)

1 \ 2	l	r
U	(1,1)	(0,0)
D	(0,0)	(0,0)

(U, l) is a NE, but so is (D, r)

1 \ 2	l	c	r
U	0,4	(4),0	5,3
M	(4),0	0,4	5,3
D	3,5	3,5	(6),6

$BR_1(l) = M$ $\quad BR_2(U) = l$

$BR_1(c) = U$ $\quad BR_2(M) = c$

$BR_1(r) = D$ $\quad BR_2(D) = r$

$NE = (D, r)$

1 \ 2	l	c	r
U	0, 2	2, 3	4, 3
M	(11), 1	(3), 2	0, 0
D	0, 3	1, 0	(8), 0

$NE = (M, c)$

Investment Game

players – you

strategy sets – invest 0 or invest \$10

payoffs – if do not invest, then → 0

if do invest \$10, → \$5 net profit if ≥ 90% invest; -\$10 net loss if < 90% invest

NE = { all invest; no-one invest }

(guess) and (check)

("converged")

« different social problem than that of prisoners dilemma »

(Coordination) – communication can help

(NE can be self enforcing agreements)