

# Prisoners Dilemma:

Best Responses Interest

	$P_1$	$P_2$	
Confess	C	$-3, -3$	$0, -4$
Deny	D	$-4, 0$	$-1, -1$

Annotations: A purple arrow points from 'Best Responses Interest' to the top-right cell. A yellow arrow points from the top to the top-right cell. A green circle highlights the  $-3, -3$  payoff. A yellow box highlights the  $0, -4$  payoff. A green circle highlights the  $-4, 0$  payoff. A purple circle highlights the  $-1, -1$  payoff. A purple arrow points from 'Confess' to the top row. A purple arrow points from 'Deny' to the bottom row.

# 'Best Response' (BR)

$$BR_i(a_{-i})$$

of player  $i$

given fixed action of all other players.

$$BR_1(C) = C$$

$$BR_1(D) = C$$

$$BR_2(C) = C$$

$$BR_2(D) = C$$

Best  
Response  
Dynamic

Player 2

Player 1  
Denies

Nash Equilibrium'  
(NE)  
Intersection of best  
Responses.

NE — each player  
is playing his best response  
to the actions of all the  
other players.

NE has interesting implications:

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NE is a 'SELF ENFORCING' Agreement

$P_1 \backslash P_2$	C	D
C	-3, -3	0, -4
D	-4, 0	-1, -1

Nash equilibrium is also a 'self enforcing' agreement.

$P_1 \backslash P_2$	C	D
C	-3, -3	0, -4
D	-4, 0	-1, -1

Nash equilibrium -  
Outcome from which  
no player has an  
incentive to deviate unilaterally.

Nash Equilibrium  
is a 'No-Regret'  
outcome

No-Regret'

$P_1 \backslash P_2$	C	D
C	-3, -3	0, -4
D	-4, 0	-1, -1

Nash Equilibrium:

$a_1^* a_2^* \dots a_N^*$  — NE  
N player

if for each player  $i$

$$u_i(a_i^*, a_{-i}^*) \geq u_i(a_{-i}, a_{-i}^*)$$

- has to hold for  
each player  $i$
- each action  $i$