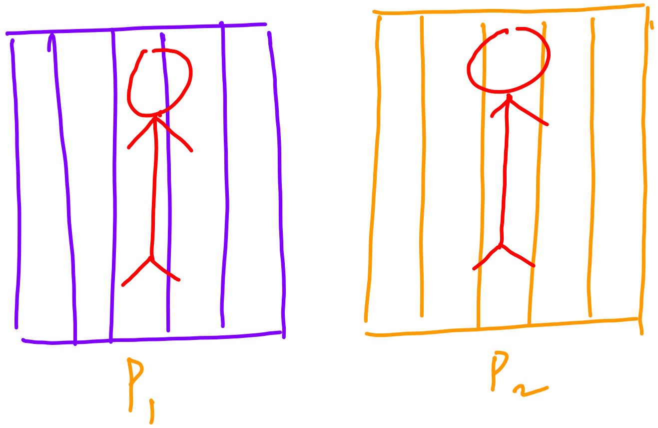
Prisoner's Dilemma:



accused of a major crime

- No eyewitness
- to get one or both to CONFESS

Both prisoners are interrogated in separate rooms — No communication allowed between them.

2 Possible Actions

- Confess (C)
- Deny (D)

IF both deny, each gets 1yr sentence.

If both confess, each gets a prison sentence of 3 years.

- IF one confesses, and other denies, confessor walks free or 0 yr, one who denies gets a sentence of 4 yrs.

PD

Prisoners

Confess or Deny

Minimize Prison sentence

No Communication

Game Table:

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

'strategic'

Payoff is determined by action of individual together with actions of competitors.

Set of Players. $\{P_1, P_2\}$

Set of rules -

A_i denotes action-set of player i

$A_1 = \{C, D\}$

$A_2 = \{C, D\}$ action set of P_2

action set of P_1

Set of outcomes O

$O = A_1 \times A_2$

$= \{(C,C), (C,D), (D,C),$

$(D,D)\}$

$u_i(\cdot)$

$u_1(\cdot)$, $u_2(\cdot)$

payoffs

$u_i(a_i, a_{-i})$ actions of rest

$u_1(a_1, a_2)$

$u_2(a_2, a_1)$

$$\underline{u_i(\underline{a_i}, \underline{a_{-i}})}$$

Utility or payoff of i^{th} player.

$$u_1(c, c) = -3$$

Player 1 confesses

Player 2 confesses

$$u_1(C, D) = 0$$

Player 1 Confesses

Player 2 Denies

$$u_2(C, D) = 0$$

Player 2

Player 2 Confesses

Player 1 Denies

$$u_1(C, C) = -3$$
$$u_1(C, D) = 0$$
$$u_1(D, C) = -4$$
$$u_1(D, D) = -1$$

$$u_2(C, C) = -3$$
$$u_2(C, D) = 0$$
$$u_2(D, C) = -4$$
$$u_2(D, D) = -1$$

$$u_i(a_i, a_{-i})$$

Player i | action of Player i | action of all players other than i

Why is PD useful in practice:

Retail Price war

2 Shops, Retail chains,

Prices – High (H)
– Low – (L)

Simple market
Retail chains,
online retail stores,

Deny

R_1 \ R_2	H	L
H	500, 500	0, 750
L	750, 0	250, 250

Confess