## 1-4-Examples-2

2020年6月5日 星期五 下午2:24

> acA pure competition 2 U1(a) + U2(a)= C C=0. Cooperation tack thing Uilas Elijas



1-4-Example...





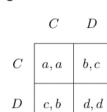
#### Game Theory Intro

Game Theory Course: Jackson, Leyton-Brown & Shoham Game Theory selection strategies zero-sum probability Online

### More General Form

Game Theory obability Online

Prisoner's dilemma is any game



with c > a > d > b.

#### Games of Pure Competition

Players have exactly opposed interests

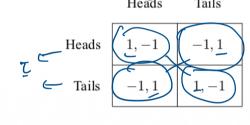


- There must be precisely two players (otherwise they can't have
- exactly opposed interests)
- For all action profiles  $a \in A$ ,  $u_1(a) + u_2(a) = c$  for some  ${\bf constant}\; c$ 
  - Special case: zero sum
- Thus, we only need to store a utility function for one player
  - in a sense, we only have to think about one player's interests

#### **Matching Pennies**

One player wants to match; the other wants to mismatch.



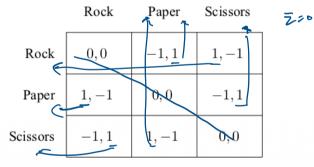


same side Luin 1 your-1 michaetahi Zloss -1 yourin 1

## Rock-Paper-Scissors

Generalized matching pennies.





...Believe it or not, there's an annual international competition!

## Games of Cooperation

Game

Players have exactly the same interests.

- no conflict: all players want the same things  $\bullet \ \forall a \in A, \forall i,j, \underline{u_i}(a) = \underline{u_j}(a) \ \text{ let-tray game}$
- we often write such games with a single payoff per cell
- why are such games "noncooperative"?

# Coordination Game

Game

Theory

Which side of the road should you drive on? Right

> 0, 0Left Right

General Games: Battle of the Sexes

competition.

The most interesting games combine elements of cooperation and