

# ASSIGNMENT SIX



# GAME



- Similar to *paper-scissors-stone*. Without stone
- Make pairs, or if really necessary, trios
- Get something to keep the scores
- Scoring table →
- Play the game
- Trio: three games (A-B, A-C, B-C)

	Paper	Scissors
a / b	3 / 3	0 / 4
Paper	3 / 3	0 / 4
Scissors	4 / 0	1 / 1



# PLAY SEVERAL TIMES

- as if final score is paid in euros

$a / b$  	Paper	Scissors
Paper	3 / 3	0 / 4
Scissors	4 / 0	1 / 1



# INTERPRETATION

## PRISONER'S DILEMMA

- Buy something via the internet
- *Paper*: pay resp. send item – **Cooperate**
- *Scissors*: do not pay resp. do not send item – **Defect**

a / b	C send money	D do not send money
C send item	both content	lose item / get item for nothing
D do not send item	get money for nothing / lose money	no gain, no loss



# EXPERIMENTS

## (NOT THIS ASSIGNMENT)

- Pitch players against each other, play several rounds
- *Program* a strategy, taking into account the history
- Which strategy gets the most points?
- Often: Tit-for-tat
  - play what opponent played last time
  - start with C



# HOW BENEFICIAL IS DEFECTING?

DONEC QUIS NUNC

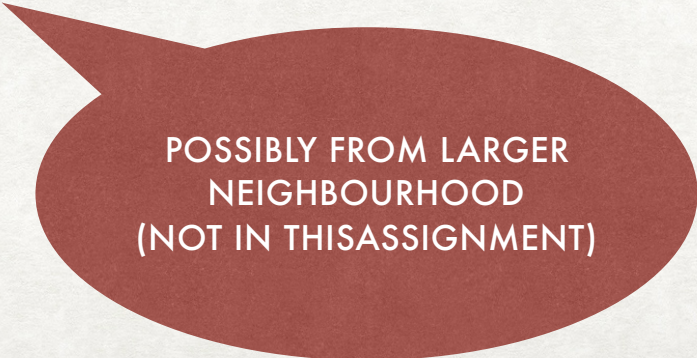
- completely rational in one-off game
- repeated game: expect retaliation, reputation becomes important
- idea: cooperative behaviour (seemingly altruistic) result of evolution because it is beneficial (and expensive to learn the hard way)
- simulate evolution



# EVOLUTION

## MULTIPLE PLAYERS

- Players distributed in space
- Play to everyone in the *neighbourhood*  
e.g. 8 neighbours in rectangular grid
- C gets a point for every C in neighbourhood
- D gets a point \* *factor* for every C in neighbourhood
- Adopt strategy of most succesful neighbour
- and repeat



POSSIBLY FROM LARGER  
NEIGHBOURHOOD  
(NOT IN THISASSIGNMENT)