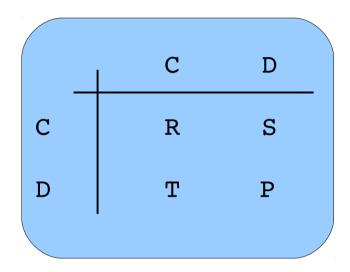
Conflict and Cooperation in Microorganisms

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Exercise1

Analyze this game with different conditions e.g., T>R>P>S, T>R>S>P, ...



R: Reward for mutual cooperation

P: Punishment for mutual defection

T: Temptation to defect

S: Sucker's payoff

Exercise2

Assume that the production of a public good has a cost c and generates total benefits that are captured with efficiency e.

- plot the fraction of cooperators, f, in a parameter space (c,e)

- imagine that the payout of defection (and thus of cooperation) is non-linear; plot again the fraction of cooperators, f, in the (c,e) space

- discuss the results

Ref. Gore et al, Nature 459, 253 (2009)

Exercise3

- Simulate the Simpson's paradox in matlab
- Discuss the conditions in which cooperation evolves, plotting several parameters spaces; e.g., number of groups vs. size of groups, etc.