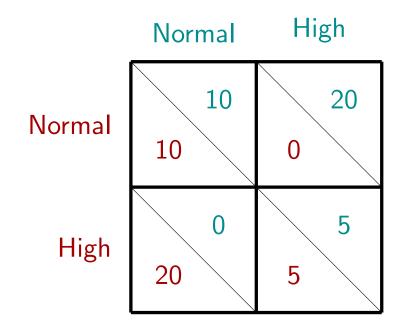# Game Theory and Computational Social Choice

Ulle Endriss

Institute for Logic, Language and Computation

University of Amsterdam

Game Theory

Game theory is the study of mathematical models for the analysis of strategic interactions between rational agents. Example:

	Normal	High
Normal	10 \ 10	20 \ 0
High	0 \ 20	5 \ 5

Keywords: strategic games, mechanism design, coalitional games

Computational Social Choice

Social choice theory is concerned with the design and analysis of methods for collective decision making. <u>Example:</u>

2 Germans: Beer ≻ Wine ≻ Milk

3 French people: Wine ≻ Beer ≻ Milk

4 Dutch people: Milk ≻ Beer ≻ Wine

<u>Keywords:</u> voting theory, fair allocation, judgment aggregation

Course Characteristics

- *Commonalities*

    – Analysis and discussion of formal models of real-world concepts
    – Lots of problem solving / proofs, mathematical maturity expected
    – No programming required, though some possible

- *Game Theory*

    – Focus on textbook material in mathematical economics
    – Assessment: homework + exam

- *Computational Social Choice*

    – Focus on current research, topics change every year
    – Assessment: homework + group research project (paper/talk)
    – Limited number of participants

Appeal: Full information on both courses is available from my *website*. Please have a look before registering.