Homework #5

Deadline: Wednesday, 19 May 2021, 18:00

Question 1 (10 marks)

Consider the following two definitions for the unanimity of a judgment aggregation rule F:

- *Propositionwise unanimity:* F is unanimous if, for every formula $\varphi \in \Phi$ and every profile $\boldsymbol{J} \in \mathcal{J}(\Phi)^n$, it is the case that $\varphi \in J_i$ for all agents $i \in N$ implies $\varphi \in F(\boldsymbol{J})$. That is, if every agent accepts φ, then so should the aggregation rule.
- *Simple unanimity:* F is unanimous if, for every judgment set $J \in \mathcal{J}(\Phi)$, it is the case that $F(J, \ldots, J) = J$. That is, if all agents report exactly the same judgment set, then that same set should also be the output of the aggregation rule.

Show that these two definitions indeed define different concepts. Then show that, when restricted to independent judgment aggregation rules that guarantee the consistency of outcomes, the two definitions coincide.

Question 2 (10 marks)

A *weak Condorcet winner* is an alternative that wins or draws against any other alternative in pairwise majority contests. Just like a (normal) Condorcet winner, a weak Condorcet winner need not exist. Unlike a Condorcet winner, however, when it does exist, a weak Condorcet winner need not be unique. In the context of voting in combinatorial domains, show that when voters model their preferences using the language of prioritised goals and each voter specifies only a single goal, then there always is a weak Condorcet winner.