

## Implementation in Mixed Nash Equilibrium

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**Abstract:** A mechanism implements a social choice correspondence  $f$  in mixed Nash equilibrium if, at any preference profile, the set of *all* (pure and mixed) Nash equilibrium outcomes coincides with the set of  $f$ -optimal alternatives at that preference profile. This definition generalizes Maskin's definition of Nash implementation in that it does not require each optimal alternative to be the outcome of a *pure* Nash equilibrium. We show that the condition of weak set-monotonicity, a weakening of Maskin's monotonicity, is necessary for implementation. We provide sufficient conditions for implementation and show that important social choice correspondences that are not Maskin monotonic can be implemented in mixed Nash equilibrium.