2. Leading from Strength: Eliminating Dominated Strategies

Strictly Dominated Strategy and Weakly Dominated Strategy
Suppose $s_i$ and $s'_i$ are two strategies for player $i$ in a normal form game. We say $s'_i$ is strictly dominated by $s_i$ if, for every choice of strategies of the other players, $i$’s payoff from choosing $s_i$ is strictly greater than $i$’s payoff from choosing $s'_i$. We call $s'_i$ dominated strategy and $s_i$ dominant strategy.

We say $s'_i$ is weakly dominated by $s_i$ if, for every choice of strategies of the other players, $i$’s payoff from choosing $s_i$ is at least as great as $i$’s payoff from choosing $s'_i$.

Iterated Elimination of Strictly Dominated Strategies.
After we have eliminated strictly dominated strategies of one player, we may find that there are now strictly dominated strategies for another player, which we can eliminate as well. We can continue this until there are no strictly dominated strategies left. We call this the iterated elimination of strictly dominated strategies.

Remarks
1. If a unique strategy remains for the player, we call this the player’s dominant strategy.
2. If a unique strategy remains for all players, we call this strategy profile a dominant strategy equilibrium.
3. A dominant strategy equilibrium is a Nash equilibrium. And we can eliminate dominated strategies without losing any Nash equilibria.
4. If the iterated elimination of weakly dominated strategies leaves exactly one strategy for each player, the resulting strategy profile is a Nash equilibrium. However some Nash equilibria can be discarded this way.

Iterated Elimination of Dominated Strategies

When you eliminate strictly dominated strategies, order of deleting does not matter.
When you eliminate weakly dominated strategies, you can throw away Nash equilibria

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