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Game Theory

Game theory is a theoretical framework for conceiving social situations among competing players. In some respects, game theory is the science of strategy, or at least the optimal decision-making of independent and competing actors in a strategic setting.

How Game Theory Works?

Game theory tries to understand the strategic actions of two or more "playersïn a given situation containing set rules and outcomes. Any time we have a situation with two or more players that involve known payouts or quantifiable consequences, we can use game theory to help determine the most likely outcomes.

Useful Terms in Game Theory

Here are a few terms commonly used in the study of game theory:

Game: Any set of circumstances that has a result dependent on the actions of two or more decision-makers (players).

Players: A strategic decision-maker within the context of the game.

Strategy: A complete plan of action a player will take given the set of circumstances that might arise within the game.

Payoff: The payout a player receives from arriving at a particular outcome. The payout can be in any quantifiable form, from dollars to utility.

Information set: The information available at a given point in the game. The term information set is most usually applied when the game has a sequential component.

Equilibrium: The point in a game where both players have made their decisions and an outcome is reached.

Nash Equilibrium

Nash equilibrium is an outcome reached that, once achieved, means no player can increase payoff by changing decisions unilaterally. It can also be thought of as "no regrets,ïn the sense that once a decision is made, the player will have no regrets concerning decisions considering the consequences.

Generally, there can be more than one equilibrium in a game. However, this usually occurs in games with more complex elements than two choices by two players. In simultaneous games that are repeated over time, one of these multiple equilibria is reached after some trial and error.
