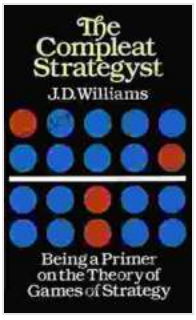
A Comprehensive Primer on the Theory of Games of Strategy: A Dover Book on Mathematics

The theory of games of strategy is a branch of mathematics that studies the interactions between rational decision-makers. It has applications in a wide range of fields, including economics, political science, computer science, and biology.

This primer provides a comprehensive to the theory of games of strategy. It covers both the foundational concepts and advanced applications. The book is written in a clear and concise style, and it includes detailed explanations, illustrative examples, and practice problems.

The foundational concepts of the theory of games of strategy include:



The Compleat Strategyst: Being a Primer on the Theory of Games of Strategy (Dover Books on Mathematics)

by J. D. Williams

4.3 out of 5

Language	: English
File size	: 26391 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 478 pages
Lending	: Enabled

- **Players:** The individuals or groups who make decisions in a game.
- **Strategies:** The actions that players can take.
- **Payoffs:** The outcomes that players receive for taking certain actions.
- **Nash equilibrium:** A set of strategies, one for each player, such that no player can improve their payoff by changing their strategy.

There are two main types of games of strategy:

- **Non-cooperative games:** Games in which players cannot communicate or cooperate with each other.
- **Cooperative games:** Games in which players can communicate and cooperate with each other.

The theory of games of strategy has a wide range of applications, including:

- **Economics:** Game theory is used to study competition in markets, auctions, and other economic settings.
- **Political science:** Game theory is used to study voting, bargaining, and other political processes.
- **Computer science:** Game theory is used to design algorithms for solving complex problems, such as scheduling and routing.
- **Biology:** Game theory is used to study animal behavior, evolution, and other biological phenomena.

The theory of games of strategy is a powerful tool for understanding and predicting the behavior of rational decision-makers. This primer provides a comprehensive to the subject, and it is an essential resource for anyone who wants to learn more about game theory.

1. Consider a two-player non-cooperative game with the following payoff matrix:

| Player 2 | Left | Right | |---|---|---| | Player 1 | Up | 3, 1 | 0, 0 | | Player 1 | Down | 0, 0 | 1, 3 |

Find the Nash equilibrium of this game.

2. Consider a two-player cooperative game with the following payoff matrix:

| Player 2 | Left | Right | |---|---|---| | Player 1 | Up | 5, 5 | 0, 0 | | Player 1 | Down | 0, 0 | 3, 3 |

Find the core of this game.

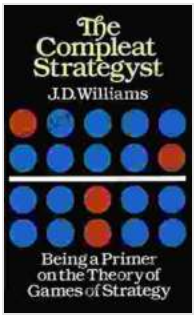
3. Consider the following evolutionary game:

| Player 2 | Hawk | Dove | |---|---|---| | Player 1 | Hawk | 3, 1 | 0, 0 | | Player 1 | Dove | 0, 0 | 2, 2 |

Find the evolutionarily stable strategy for this game.

1. The Nash equilibrium of this game is (Up, Left).

2. The core of this game is the set of all payoff vectors (x, y) such that x >= 5 and y >= 5.
3. The evolutionarily stable strategy for this game is (Hawk, Dove).



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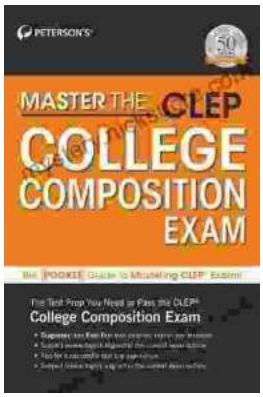

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