

Chapter 18: Game Theory

best response := the choice that yields the highest payoff GIVEN the other player's action

Nash Equilibrium := the outcome to a game in which everyone best responds

↳ requires correct expectations of others' actions

Prisoner's Dilemma:

| | | | |
|----------|---|-------------|-------------|
| | | Player 2 | |
| | | A | B |
| Player 1 | A | GOOD | worst, best |
| | B | best, worst | BAD |

if we both play A, we are both happy
BUT how do I trust you to also play A?
If you play A, I want to play B
So we both end up playing B

there is
incentive
to cheat

EX: Player 1

| | | | |
|----------|---|-----------------|---------|
| | | <u>Player 2</u> | |
| | | A | B |
| Player 1 | A | (10, 10) | (0, 15) |
| | B | (15, 0) | (5, 5) |

NE = B, B ; payoff = (5, 5)

dominant strategy := a strategy that is the BR no matter the other players' action

· if both players have dominant strategies, both playing their dominant strategies will be the NE

· if one player has a dominant strategy, they will play it ; the other will BR

maximin strategy := a strategy that maximizes the worst possible outcome (equivalent to avoiding worst possible outcome)

Coordination Games:

· neither player has a dominant strategy which leads to multiple equilibria

| | | | |
|----------|---|-----------|-----------|
| | | Player 2 | |
| | | A | B |
| Player 1 | A | BEST, bad | WORST |
| | B | WORST | bad, BEST |

Anticoordination Games:

· neither player has a dominant strategy which leads to multiple equilibria

| | | | |
|----------|---|-----------|-----------|
| | | Player 2 | |
| | | A | B |
| Player 1 | A | WORST | BEST, bad |
| | B | bad, BEST | WORST |

· w multiple equilibria, one can be better than the other for everyone

↑ MOST IMPORTANT FOR EXAM

OTHER TOPICS ↓

· ultimatum game

· repeated games

· strategies for repeated games