



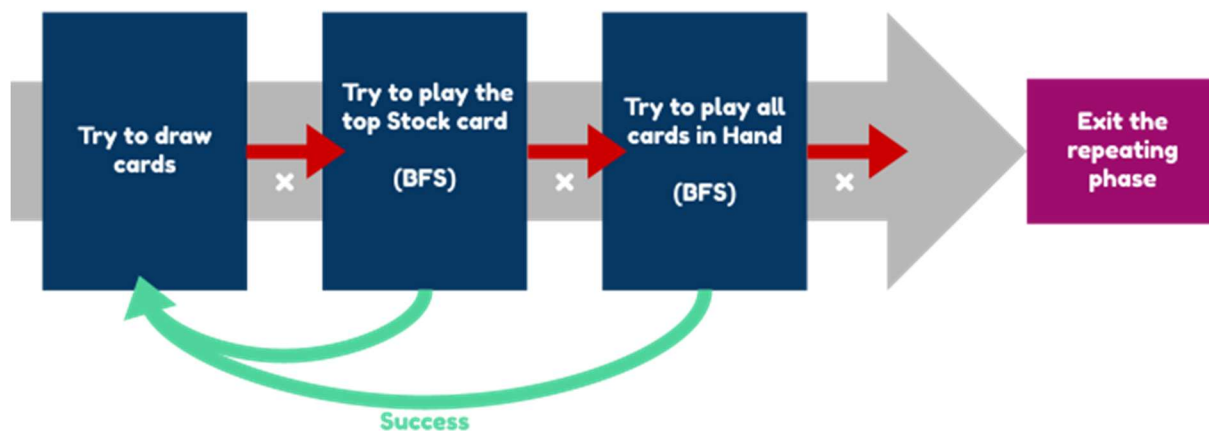
Skip-Bo With AI Agent

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How does the AI Agent Work?

- Treats each turn as a series of distinct actions
- Repeating action phase that ends when no more “repeating actions” can be taken
- Three final actions at the end of the turn

Repeating Action Phase



Repeating Action #1: Draw Cards

- Draws cards if there are none left in the hand

Repeating Action #2: Play from the Stock

- Attempts to play the top card of the stock, which is the goal of the game.
- **Breadth-first search** of game states that can be reached with cards in the hand and discard pile

- **Heuristic: What is the closest foundation to the stock? How close is it?**
- Penalizes use of Skip-Bo cards.
- If the top card is a Skip-Bo, picks a foundation at “weighted” random

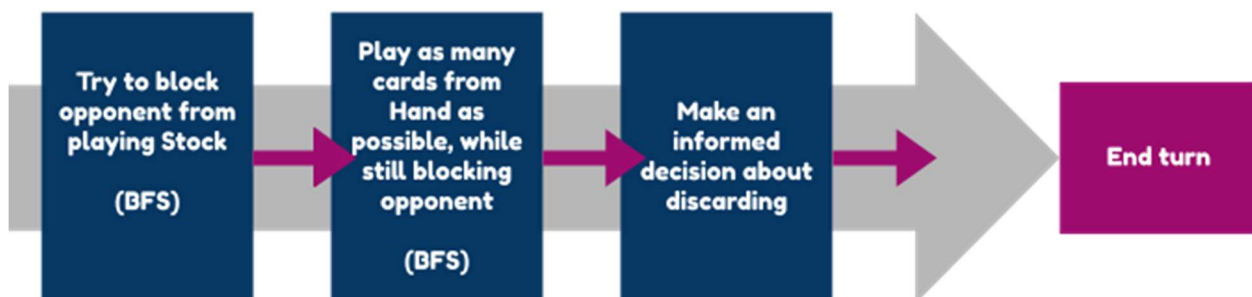


Repeating Action #3: Play all the Cards from the Hand

- Attempts to play all of the remaining cards in the hand
- **Breadth-first search** of game states that can be reached with cards in the hand and discard pile
- **Heuristic: Fewest cards in the hand**
- Penalizes use of Skip-Bo cards, but will use them up if they are there

Final Action Phase

- Attempts to carry out three one-time actions.



Final Action #1: Block the Opponent

- Attempts to block the opponent from playing the top card of the stock
- **Breadth-first search** of game states that can be reached with cards in the hand and discard pile
- Heuristic: **What is the closest foundation to the opponent's stock? How close is it?**
- Penalizes use of Skip-Bo cards.

Final Action #2: Play Remaining Cards

- Play as many cards from the hand as possible but ignores any ending state that allows the opponent to play the stock card
- **Breadth-first search** of game states that can be reached with cards in the hand and discard pile
- Heuristic: **Fewest cards in the hand**
- Forbids the use of Skip-Bo cards

Final Action #3: Discard

- Makes an informed decision about discarding to end the turn
- Discarding strategies, in order of priority:
 1. If any of the cards in my hand matches the top card in a Discard pile, put it on top
 2. If any of the cards in my hand is one less than the top card in a Discard pile, put it on top
 3. If there is an empty Discard pile and I have more than one of a certain type of card, put it on the empty Discard pile
 4. If there is an empty Discard pile, play my highest card on it.
 5. If any of the cards in my hand is two less than the top card in a Discard pile, put it on top
 6. If any of the cards in my hand is three less than the top card in a Discard pile, put it on top
 7. Discards at random if there aren't any better moves.

