

Swap Hold'em

We **strongly recommend** learning the rules of Texas Hold'em before learning Blotto Hold'em. Two helpful resources are pkr.bot/poker-rules and pkr.bot/poker-video.

Overview

The poker variant for 6.176 Pokerbots Competition in IAP 2022 is "No-Limit Swap Hold'em," a new game based on the popular poker variant No-Limit Texas Hold'em. The main modification is that on the flop and turn, there's a small chance that each of the player's hole cards are randomly swapped with a card from the deck. On the flop, the probability of a swap is 10%, and on the turn, the probability of a swap is 5%. **Note that these probabilities may change later in the competition.** Each hole card is evaluated individually, meaning there's a 1% chance that both hole cards are swapped.

Glossary

Hole cards	A player's two private cards
Board cards	Cards that are public and shared between the players
Pot	The accumulation of bets and other payments made by the players during a round to be claimed by the winner of the round
Stack	A player's individual resources they use for bets and other payments during a round
Pip	A player's contribution to the pot during a round of betting
Blinds	Small forced bets at the beginning of the round to kick off the pot
Call	A minimum pot contribution to stay in the round in response to a bet or raise
Check	A "pass" or bet of 0
Fold	To quit the round and let the other player claim the pot
Flop	When the first three board cards are dealt
Turn	When the fourth board card is dealt
River	When the fifth and final board card is dealt
Showdown	When the players' hole cards are revealed to determine the winner of the round who claims the pot

Game Logistics

A game of Swap Hold'em consists of a number of rounds played between two players. In every round, each player is allocated a stack before the cards are dealt. The change in a player's stack at the end of the round is used to update that player's bankroll, which starts at 0. The player with the highest cumulative bankroll after the last round is played wins the game.

Parameters

Rounds: 1000

Stack allocated per round: 200

Big blind: 2

Small blind: 1

Sequence of Play

A round of No-limit Swap Hold'em has all the stages as standard Texas Hold'em, with 2 extra swap stages.

1. Pay blinds
2. Deal hole cards
3. Round of betting
4. Deal flop
5. Cards are randomly swapped
6. Round of betting
7. Deal turn
8. Cards are randomly swapped
9. Round of betting
10. Deal river
11. Round of betting
12. Showdown

Deal

The hole cards, flop, turn, and river deals are the same as in standard Texas Hold'em.

Blinds

In each round, one player is designated as the dealer. The dealer alternates between successive rounds. To start the round, the dealer pays the small blind and their opponent pays the big blind. The blinds are a mandatory bet of 1 by the dealer followed by a mandatory raise to 2 by their opponent, which leaves the dealer to act next.

Swap

After the flop and turn are dealt, each player's hole cards may change. On the flop for each card, there's a 10% chance it's randomly replaced with one from the deck. Cards are evaluated independently, meaning there's a 1% chance that both of a player's hole cards are swapped. On the turn, this probability is reduced to 5%. Note that these may change later in the competition.

Betting remains the same, and is performed after cards have been swapped.

Betting

In the first round of betting (labeled 3 above), the dealer is the first player to act. In this first action, the dealer may fold (cost: 0), call (cost: 1), or raise (cost: 3+).

In all other rounds of betting, the dealer's opponent is the first player to act. In this action, the player may check (cost: 0) or bet (cost: 2+). The minimum legal bet is 1 big blind. The maximum legal bet is bounded by both players' remaining stack sizes; this ensures that neither player can make a bet that their opponent is unable to call.

When a player is faced with a bet or raise from their opponent, that player is allowed to raise. There is no limit on the number of consecutive raises that may occur in a round of betting.

The raise amount is defined as the amount by which the raising player's pip exceeds their opponent's pip. Equivalently, this is the opponent's cost of calling after the raise. It is common in Hold'em to place restrictions on the raise amount in order for a raise to be legal.

In Swap Hold'em, the minimum legal raise amount is the size of the previous bet if responding to a bet or the previous raise amount if responding to a raise. The maximum legal raise amount is bounded by both players' remaining stack sizes so that neither player can make a raise that their opponent is unable to call.

If the remaining stack sizes do not allow for a minimum legal raise amount, i.e. the maximum is below the minimum, then the only legal raise is the maximum legal raise amount. This occurs when a player makes an all-in raise.

The round of betting ends when a player calls, when a player folds, or when both players check in a row. In the first round of betting, if the dealer calls right away, then the round does not end and their opponent is given the opportunity to act: check (cost: 0) or raise (cost: 2+).

These are the standard Texas Hold'em betting rules; we encourage those unfamiliar with betting in Hold'em to revisit the resources pkr.bot/poker-rules and pkr.bot/poker-video for a refresher.

Showdown

The winner of the round is determined by the standard Texas Hold'em hand rankings. In the case of a tie, players' bankrolls do not change.