

Goldfish UserManual V1.0

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Rules of Poker

1. 2 players minimum, 10 players maximum
2. Setup
 - a. The dealer button* designates a player to be the dealer for the match. The player to the immediate left (of the dealer) receives the first card. Then cards are pitched around the table in a clockwise motion until each has received 2 hole cards*. The first round of betting then begins.
 - i. The player directly to the left of the dealer button posts the small blind*, and the player to his or her direct left posts the big blind*.
3. First Betting Round: Preflop
 - a. The first player to act is the player to the left of the big blind. The play proceeds in a clockwise fashion around the table. Each player has 3 options: Call*, Raise*, or Fold*. Once the last bet is called, the first 3 community cards* are dealt and a second betting round begins (involving only the players who have not folded).
 - i. If a player chooses to fold, he/she is out of the game and no longer eligible to win the current hand. Cards are thrown into The Muck*
4. Second Betting Round: The Flop
 - a. In this betting round (and subsequent ones), the action starts with the first active player to the left of the button. Along with the initial options to call, raise, and fold, a player now has the option to check* if no betting action has occurred beforehand. Once the last bet is called, the fourth community card* is dealt and a third betting round begins.
5. Third Betting Round: The Turn
 - a. Another round of betting (similar to the previous round) occurs. Once the last bet is called, the fifth and last community card* is dealt and a final betting round begins.
6. Final Betting Round: The River

- a. Another round of betting (similar to the previous round) occurs. Once the last bet is called, we move to the showdown.
- 7. Showdown
 - a. The remaining players with hole cards* now expose their holdings to determine a winner. The player with the best combination of five cards* wins the pot and the match ends.

**refer to the glossary for more information*

Online Poker

1. Introduction

Welcome to the Goldfish Poker Project! Designed by 5 UCI Students, this project attempts to recreate the game of Poker from scratch. This is the second team programming project of EECS 22L, "Software Engineering Project in C language".

This project is designed to be an interesting exercise where you can practice all elements of software engineering and work in teams.

In particular, you will practice specifying and documenting the software program, designing data structures and algorithms, designing software modules, designing client-server architecture, writing original source code, testing and debugging the software program, and collaborating and communicating effectively in a team.

2. Goals

The goal of this programming exercise is to design and develop an online poker program in which a user can play interactive poker against other users across the internet.

Some of our goals include:

1. Providing a robust graphical interface for players
2. Reliable and responsive network functionality
3. Handle a high player capacity
4. Create a fun and engaging social environment

3. Features

Additional features we would like to implement in our program include the following:

1. Point System
2. Handling up to 6 players
3. Interactive Buttons for actions (Call, Fold, etc.)
4. Default player character (e.g. Goldfish)

Installation

A. System Requirements

Linux with display function
std=c11 enabled
gtk library installed

B. Setup and configuration

Download tar.gz file and Makefile
Extract tar.gz file with command “gtar xvzf”
[Linux] Type “make all” to build program
[Linux] One Player host the server Type “./bin/GoldfishServer 10111”
[Linux] Type how many players (1- 6)
[Linux] Type “./bin/GoldfishClient [Servername] 10111”

C. Uninstalling

[Linux] Type “make clean”
[Linux] Type “rm Makefile”

Online Poker: Functions/Features

Recall Features:

1. Interactive Buttons for actions (Call, Fold, etc...)
2. Up to 6 Players
3. Points System
4. Default Character

Functions of Feature 1

Interactive Buttons for Actions

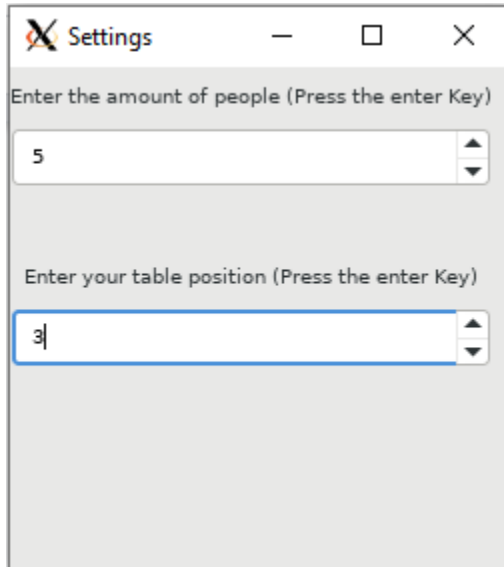
- a. User Input: Click on the buttons to determine their move, with sliders for the bets
- b. Program Output: Depending on the button press, Players call, fold, etc.
- c. Screenshot:



Functions of Feature 2

Player Count

- User Input: Type number of players and which seats
- Program Output: Connects the user to the table and position them in their seats with their username
- Screenshot:



A screenshot of a software window titled "Settings". The window has a standard Windows-style title bar with a close button (X), a maximize button (square), and a minimize button (dash). The main content area is light gray and contains two input sections. The first section is labeled "Enter the amount of people (Press the enter Key)" and features a white text box with the number "5" and a vertical scrollbar on the right. The second section is labeled "Enter your table position (Press the enter Key)" and features a white text box with the number "3" and a vertical scrollbar on the right. The text boxes have a blue border when they are active.

Functions of Feature 3

Points System

- User Input: User gains / lose points base off the outcome
- Program Output: If the user wins, the user gains a certain amount of points . If the user loses their points decrease.
- Screenshot:

Base

Points: 100

Win

Points: 100 + 50

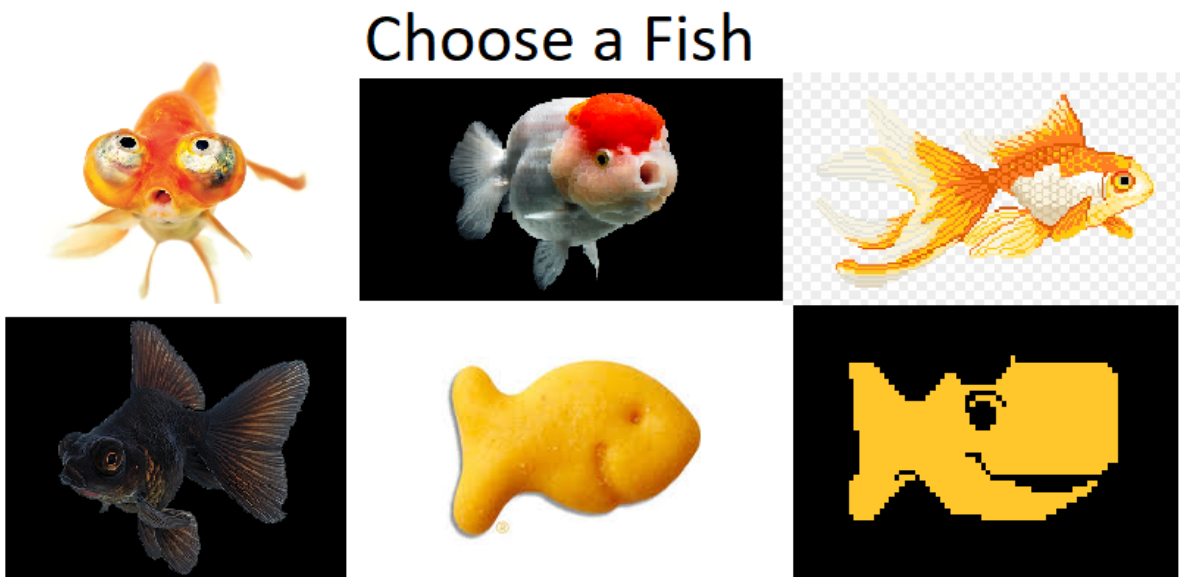
Lose

Points: 100 - 10

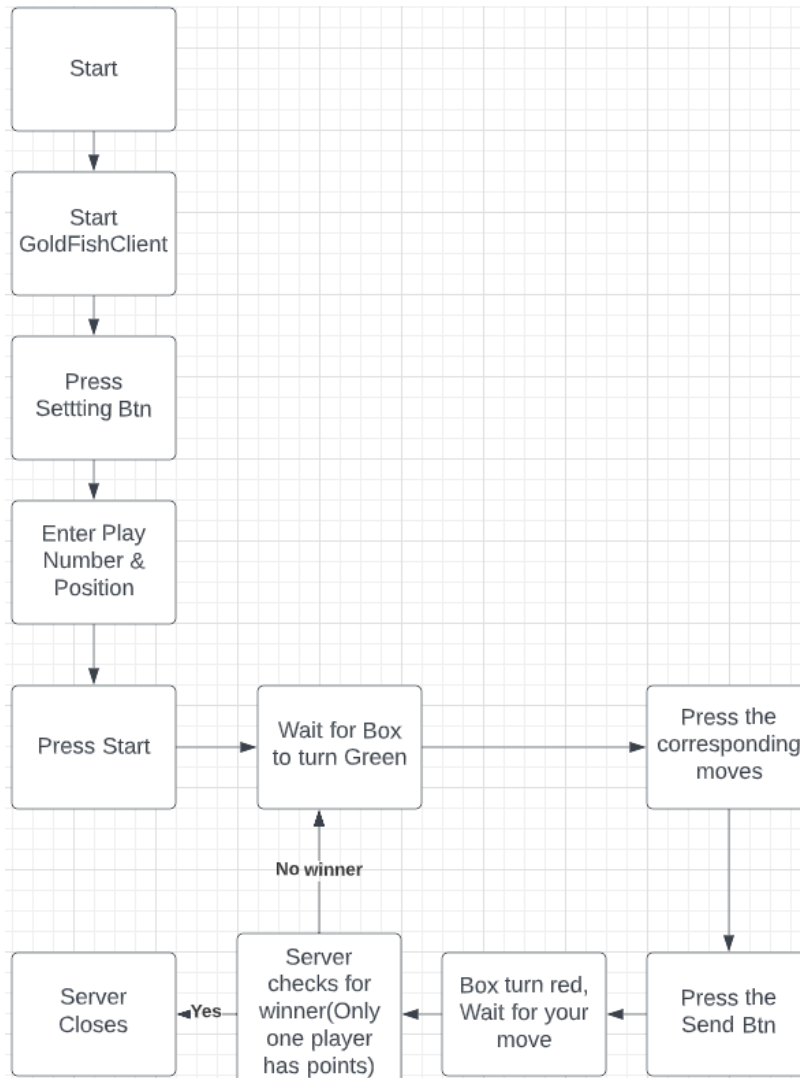
Function of Feature 4

Default Character

- a. User Input: User chooses table position for the default character placement.
 - b. Program Output: The desired character is used as an avatar representing the player.
- c. Screenshot:



Online Poker: User Flow



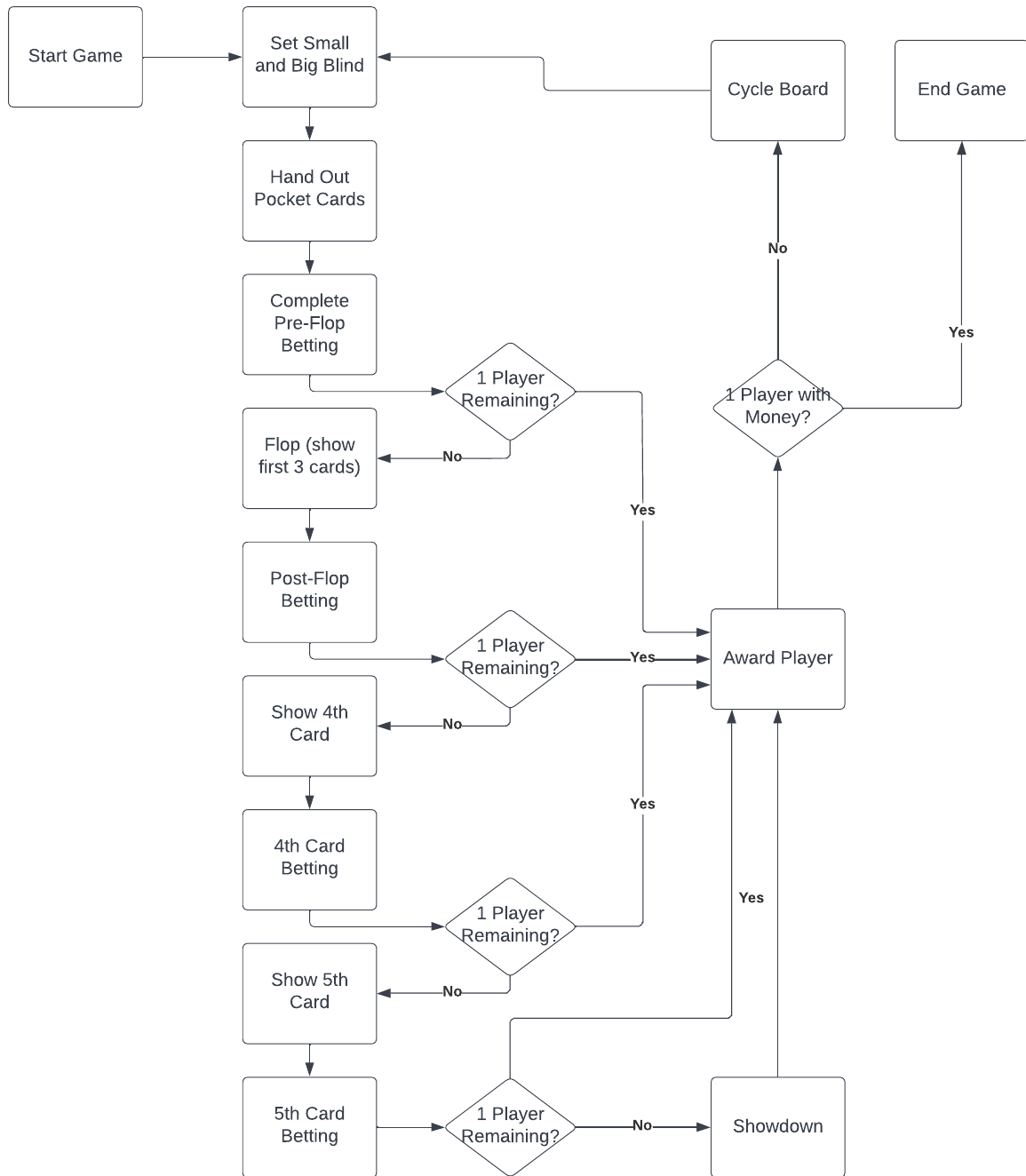
Online Poker: Client & Server Functionality

The clients will constantly send messages to the server in form “REQUEST_MESSAGE 3” where 3 is replaced with whatever player number they are. If it is not the client’s turn, the server will send back what is known as a Gamestate response. Below is an example of such a message for a game of 6 players, labeled 0 to 5. The message first states the table properties, then each player’s properties. The match is currently in the preflop betting stage, and so all table cards are set to 16-5 to denote an unknown card. The client’s program will then use this information to set the value for the cards/player balances on the screen.

```
GAMESTATE(1) TABLE POT: 12 MINIMUM_BET: 8 DEALER_NUM: 0
TOTAL_ACTIVE_PLAYERS: 6 TOTAL_PLAYERS: 6 TABLE_CARD_1: 16-5
TABLE_CARD_2: 16-5 TABLE_CARD_3: 16-5 TABLE_CARD_4: 16-5 TABLE_CARD_5:
16-5 PLAYER_NUM: 0 USERNAME: POCKET_1: 4-0 POCKET_2: 10-0 MONEY: 50
BET_AMOUNT: 0 MOVE_CHOICE: 0 TOKEN: 0 PLAYER_NUM: 1 USERNAME:
POCKET_1: 2-1 POCKET_2: 11-1 MONEY: 46 BET_AMOUNT: 4 MOVE_CHOICE: 5
TOKEN: 1 PLAYER_NUM: 2 USERNAME: POCKET_1: 8-3 POCKET_2: 14-3 MONEY: 42
BET_AMOUNT: 8 MOVE_CHOICE: 5 TOKEN: 2 PLAYER_NUM: 3 USERNAME:
POCKET_1: 8-2 POCKET_2: 8-0 MONEY: 50 BET_AMOUNT: 0 MOVE_CHOICE: 0
TOKEN: 3 PLAYER_NUM: 4 USERNAME: POCKET_1: 5-2 POCKET_2: 13-2 MONEY: 50
BET_AMOUNT: 0 MOVE_CHOICE: 0 TOKEN: 3 PLAYER_NUM: 5 USERNAME:
POCKET_1: 12-0 POCKET_2: 3-3 MONEY: 50 BET_AMOUNT: 0 MOVE_CHOICE: 0
TOKEN: 3
```

If it is the client’s turn, the server will send back a message that takes the form of “USER_INPUT_REQUEST”. This tells the client to get user input from the GUI. The client will then send back a message that looks something like “PLAYER_NUM 3 CHOICE 3 RAISE_AMOUNT 23” where 3 in this case is the player number, choice denotes a call, raise, fold, check, and raise amount is the amount raised (is ignored if choice is not to raise).

Server Game Control Flow:



Back Matter

A. Copyright

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B. Error Messages

- Pass user limit
 - Join or start another session if the game is full.
- Invalid Choice
 - Please follow game rules.
- Cannot connect to server
 - Check internet connectivity.

C. Index

1. GUI: Graphical User Interface
 - Def. An interface that uses icons/menus, and a mouse to manage interaction with the system
2. Client
 - Def. Hardware/Software that request access to a service hosted by a server
3. Server
 - Def. Network, computer program, or device the processes requests from a client connecting to the same port
4. Port
 - Def. A number designated to a single process on a given IP address
5. Process
 - Def. An application running on a computer

6. IP address

Def. A string of characters representing a device over the internet

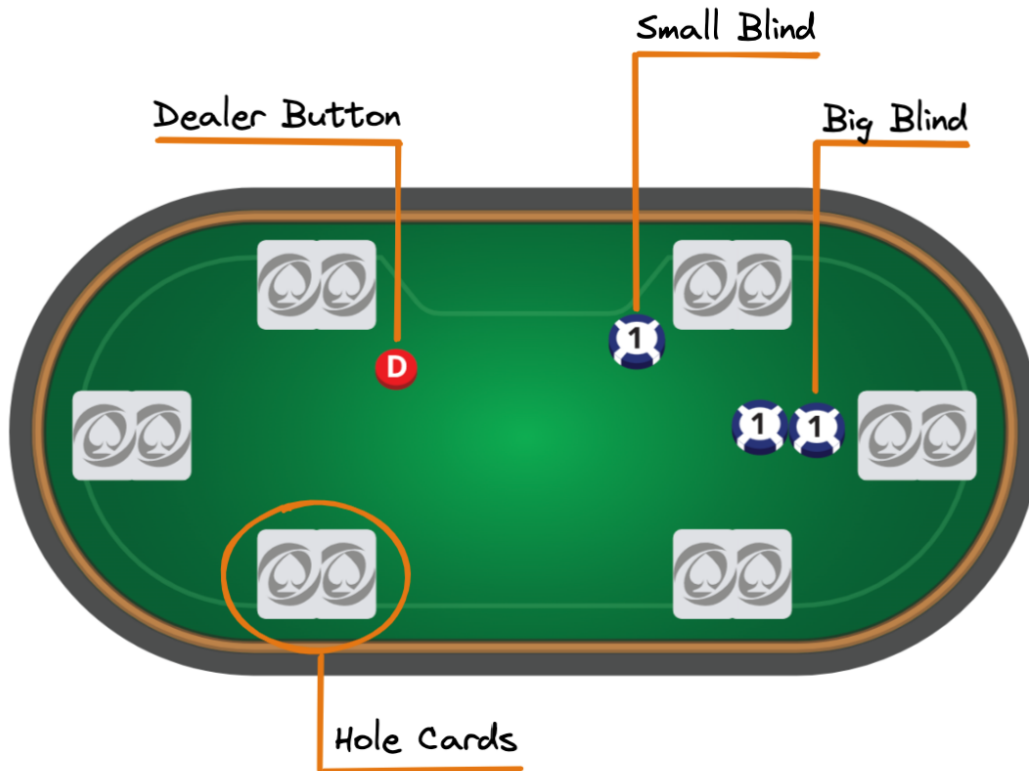
7. Gamestate

Def. Current set of information regarding a table's information, including all its players information corresponding to it

References

1. <https://developer-old.gnome.org/gtk2/stable/index.html> (For GTK library)
2. <https://www.gtk.org/> (For GTK library)
3. <https://www.thisiscolossal.com/2019/06/tsubaki-goldfish/> (Reference Goldfish Img)
4. <https://www.nationalgeographic.com/animals/fish/facts/goldfish> (Reference Goldfish
Img)
5. <https://www.aqueon.com/resources/care-guides/goldfish> (Reference Goldfish Img)
6. <https://www.deviantart.com/cutiepastarose/art/Among-Us-Coy-Fish-856305887>
(Reference Goldfish Img)
7. <https://transparencyhoe.tumblr.com/post/619635121411244032/pixel-goldfish-goldfish-symbolizes-luck-2020> (Reference Goldfish Img)

Glossary



1. Dealer Button
A round disc that sits in front of a player and is rotated one seat to the left every match. Helps to determine which player at the table is the acting dealer.
2. Small Blind
A forced bet that begins the wagering. The player directly to the left of the button posts the small blind. Generally half the amount of the big blind.
3. Big Blind
A forced bet that begins the wagering. the player directly to the left of the small blind posts the big blind.
4. Hole Cards

Two face down cards dealt to each player at the start of the game. Hole cards are used in combination along with the community cards to build a player's best possible five-card poker hand.



5. Community Cards

Five face-up cards free for each player to use in combination with their hole cards to build the best possible five-card poker hand.

6. Call: Match the betting amount of the big blind

7. Raise: Increase the bet within specific limits of the game

8. Fold: Throw hand away. Cards go into the muck

9. Check: Pass the action to the next player in hand (do nothing)

10. The Muck: Pile for cards no longer in play

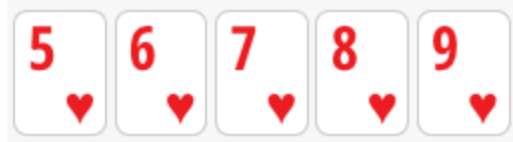
11. Five-Card Poker Hands (Best to Worst)

Note: There is no Suit-Ranking in Texas hold'em

1. Royal Flush: The best possible hand: 10, J, Q, K, A...all same suit



2. Straight Flush: Five cards of the same suit in sequential order



Note: Straight Flush can be ranked best to worst based on highest card

3. Four-of-a-Kind: Any four numerically matching cards

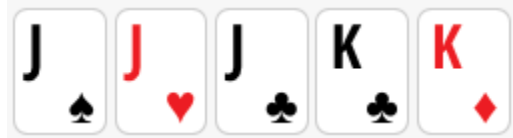
Note: in this example, the King of Diamonds can be replaced with any other card and this hand still applies

Note: Four-of-a-kinds can be ranked from best to worst based on highest four-of-a-kind



4. Full House: Combination of three-of-a-kind and a pair in the same hand

Note: Full Houses can be ranked from best to worst based on highest three-of-a-kind, then highest pair



5. Flush: Five cards of the same suit in any order

Note: a Flush can be ranked from best to worst based on first highest-ranking card, then second, and third, etc...



6. Straight: Five cards of any suit, in sequential order

Note: a Straight can be ranked from best to worst based on highest-ranking card



7. Three-of-a-Kind: Any three numerical matching cards

Note: in this example, the Four of Clubs and Five of Hearts can be replaced with any other card and this hand still applies

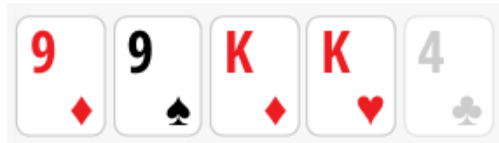
Note: a Three-of-a-kind can be ranked from best to worst based on highest three-of-a-kind, then (out of the 2 other cards remaining,) highest-ranking card



8. Two Pair: Two different pairs in the same hand

Note: in this example, the Four of Clubs can be replaced with any other card and this hand still applies

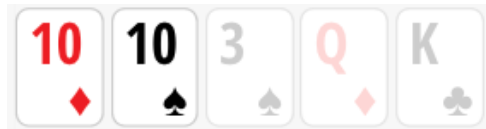
Note: a Two Pair can be ranked from best to worst based on highest-ranking pair, then second-highest pair, then highest-ranking final card



9. One Pair: Any two numerically matching cards

Note: in this example, the Three of Spades, Queen of Diamonds, and King of Clubs can be replaced with any other card and this hand still applies

Note: a One Pair can be ranked from best to worst based on highest-ranking pair, then (out of the 3 remaining cards,) highest-ranking cards



10. High Card : The highest ranked card in your hand with an ace being the highest and two being the lowest

Note: in this example, the Two of Hearts, Four of Diamonds, Eight of Diamonds, and Queen of Spades can be replaced with any other card and this hand still applies

Note: a High Card can be ranked from best to worst based on highest-ranking card, then second-highest card, etc...

