Game: Thirteen

The game Thirteen is a card game played with a standard 52-card deck. The objective of the game is to exhaust all the cards in your hand by playing cards according to the rule set by the first card or set of cards played beforehand. A more comprehensive guide on how to play is found here. There are a few differences between the ruleset in the wikipedia page and my own implementation, but that is due to how I personally learned the rules.

Notable rules include:
1. The lowest card in rotation must be played in the first played hand of the game.
2. "Bombs" or "chops" refer to the same type of hand, that is a hand that can beat a 2. Either of these can beat any kind of 2 in play as opposed to only certain types of "bombs" or "chops" being able to beat differing amounts of 2s.
3. 2s can be played in sequences.
4. The game ends when one person exhausts all of their cards.

Report:
1. Start the server listening on port number 1234
2. Server waits for the first Client to enter the game. It asks the user for their name and how many players are going to be playing [2-4] and waits for that amount of players to join.
3. Start a client, provide a username, and the number of players in the game.
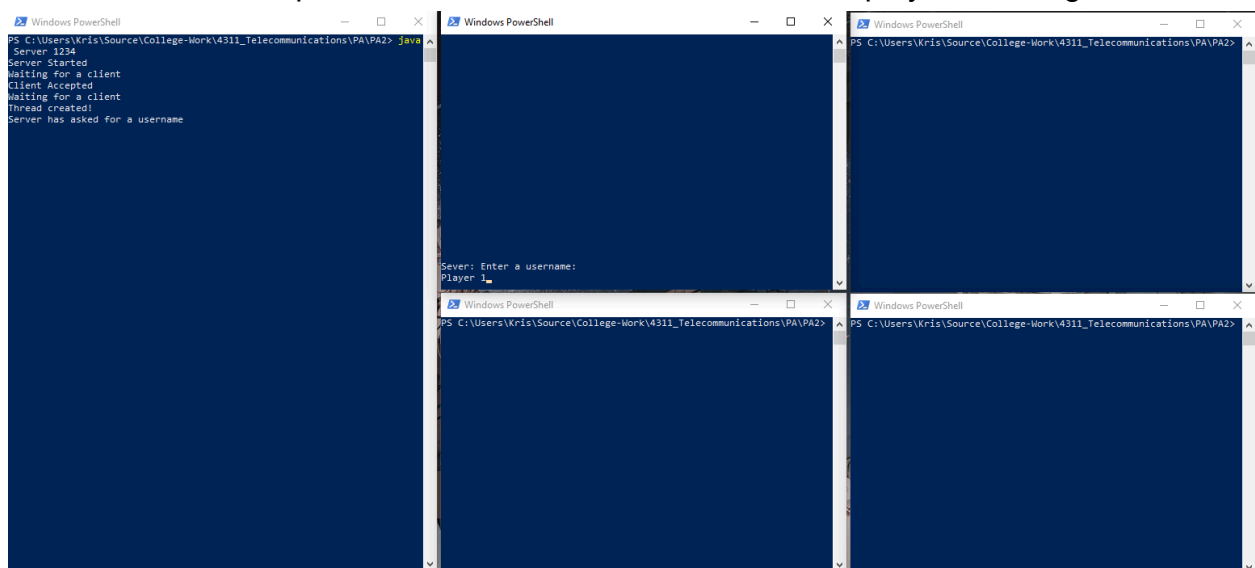
4. Start another client and provide their username. Repeat this step until there are enough players to start the game.

5. The server sends the current state of the game to all players. This includes that player's unique hand, who's turn it currently is, and the current hand that the player needs to beat.

6. To play a hand, the player needs to type the number in brackets next to the card they wish to play. If they want to play a hand with multiple cards (sequence, pair, three-of-a-kind, etc.), then they separate bracketed numbers with spaces. For the first hand of the game, the lowest card in rotation (typically the 3 of Spades) must be played.

```
Windows PowerShell                                    —   □   ×
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Hand:
[0] THREE of SPADES
[1] THREE of DIAMONDS
[2] FOUR of SPADES
[3] FIVE of DIAMONDS
[4] SIX of SPADES
[5] SEVEN of CLUBS
[6] SEVEN of DIAMONDS
[7] NINE of DIAMONDS
[8] TEN of CLUBS
[9] JACK of DIAMONDS
[10] QUEEN of HEARTS
[11] KING of HEARTS
[12] ACE of DIAMONDS
[99] Skip this round


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It is currently your turn
Player 1 can play anything
0 1_
```

7. The player with the lowest card in rotation is prompted to play a card. All signals from other clients are blocked as they're stuck in a cyclical barrier preventing input. Output is unblocked, and the status of the game can still be shared with all players.

   a. Below is me putting input for Player 1, forgetting that it's Player 2's turn.


```
Windows PowerShell               —  □  ×
[1] FIVE of DIAMONDS
[2] SIX of SPADES
[3] SEVEN of CLUBS
[4] SEVEN of DIAMONDS
[5] NINE of DIAMONDS
[6] TEN of CLUBS
[7] JACK of DIAMONDS
[8] QUEEN of HEARTS
[9] KING of HEARTS
[10] ACE of DIAMONDS
[99] Skip this round

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It is currently Player 2's turn
Current hand to beat: [KING of SPADES, KING of CLUBS]
99

9
??
hello???
oh its not my turn lmao
```

```
Windows PowerShell               —  □  ×

Player 4 has played [KING of SPADES, KING of CLUBS]
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Hand:
[0] FIVE of CLUBS
[1] FIVE of HEARTS
[2] SIX of CLUBS
[3] SIX of DIAMONDS
[4] SIX of HEARTS
[5] EIGHT of HEARTS
[6] TEN of SPADES
[7] QUEEN of SPADES
[8] TWO of HEARTS
[99] Skip this round

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It is currently your turn
Current hand to beat: [KING of SPADES, KING of CLUBS]
```

```
Windows PowerShell               —  □  ×

Player 4 has played [KING of SPADES, KING of CLUBS]
--------------------------
Hand:
[0] FIVE of SPADES
[1] EIGHT of SPADES
[2] EIGHT of CLUBS
[3] NINE of SPADES
[4] NINE of CLUBS
[5] NINE of HEARTS
[6] JACK of SPADES
[7] QUEEN of DIAMONDS
[8] KING of DIAMONDS
[9] ACE of SPADES
[10] TWO of CLUBS
[99] Skip this round

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It is currently Player 2's turn
Current hand to beat: [KING of SPADES, KING of CLUBS]
```

```
Windows PowerShell               —  □  ×

Player 4 has played [KING of SPADES, KING of CLUBS]
--------------------------
Hand:
[0] FOUR of HEARTS
[1] EIGHT of DIAMONDS
[2] TEN of DIAMONDS
[3] TEN of HEARTS
[4] QUEEN of CLUBS
[5] ACE of CLUBS
[6] ACE of HEARTS
[7] TWO of SPADES
[8] TWO of DIAMONDS
[99] Skip this round

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It is currently Player 2's turn
Current hand to beat: [KING of SPADES, KING of CLUBS]
```

8. The next person in the queue is then prompted to attempt to beat the previously played hand. They must match the type of hand played (sequence, pair, etc.) with the highest value card in their hand beating the highest value card in the previous hand (A 4 of Diamonds would beat a 3 of Spades for example).
   a. If the player plays an invalid hand, a hand that can't beat the previously played hand, then the server doesn't accept that input and prompts the user again.
   b. If no cards can be played, then the only option left for the player is to skip their turn. This isn't automatically done for the player because skipping is an available action at any time. If a player skips, then they are skipped for the rest of the round. If all other players have skipped, then the player who played the last hand starts a new round where they can play any valid hand of their choosing.

9. The game continues until one player exhausts all the cards in their hand, after which they are declared the winner and the game ends.

Known Bugs:
1. There is currently a bug that kills the OutputStream of a Client during startup, seemingly at random. Input can still be gained from the Client, but with no way to see their hand, it becomes impossible to play a game without guessing what hand the player has.
2. Input from the clients isn't *fully* blocked. If you attempt to input something when it isn't your turn, instead of dropping the input, it instead buffers it and uses it whenever the thread is unblocked.