Demo plan:

Note: Any input lines in this document will be highlighted in grey.

Calling make makes the executable hydra
To run it normally without a specific seed or being in testing mode, just call ./hydra
This will let the user play in a random seed

An example of the log of a hydra game can be found in random.txt (using random seed).

To run hydra with a specific seed, one can run:

./hydra -seed n

where n is an integer.

Set seed example

(The full log of this will be in set.txt. One can also use the eof shortcut to exit the programat any time (ctrl+D for mac). In this specific example I exit the program instead of finishing it.)

Run ./hydra -seed 2

The program will prompt “How many players?”
Type 2 for 2 players

The board will initialize. Player 1 will have drawn a card and created a head, and it is now Player 2’s turn. The result, in this case, should be

```
How many players?
2

Heads:
1: 8D (1)

Player 1: 53 (53 draw, 0 discard)
Player 2: 54 (54 draw, 0 discard)
```

Press enter or just type any line then enter to advance.
The board will print again to show the heads. It will now say this

```
Heads:
1: 8D (1)

Player 1: 53 (53 draw, 0 discard)
Player 2: 53 (53 draw, 0 discard) + 1 in hand, 0 remaining, 0 in reserve

Player 2, you are holding a QS. Your move?
```

As one can see, a card is drawn. In this case, Player 2 has drawn a Queen of spades. Player 2 has one less card in the draw pile, and 1 in hand

Type 0

The program prompts invalid input, as there is only 1 head, and if there is only 1 head, you can not put a card in reserve. The program then prompts the “you are holding…” line again.

Type 2

In this case, the head doesn’t exist. When this happens, the program will just ignore the input and prompt the “you are holding…” line again. (Without printing the invalid input line). This is how the executable given behaved. (At the time of writing this).

Type 1

The user will have cut off head 1 and created 2 more heads. The card in hand and the card in the head goes to the discard. Two cards from the draw pile was drawn and created as heads. Player 2’s turn had just ended and now it’s player 1’s turn. *Press enter to advanc*e (or any line)

```
Player 2, you are holding a QS. Your move?
1

Heads:
2: 5S (1)
3: 10D (1)

Player 1: 53 (53 draw, 0 discard)
Player 2: 53 (51 draw, 2 discard)

Player 1, it is your turn
```

The program will then output the situation of the board. As one can see player 1 is now drawing the cards and can now play 2 cards since there are two heads.

```
Heads:
2: 5S (1)
3: 10D (1)

Player 1: 52 (52 draw, 0 discard) + 1 in hand, 1 remaining, 0 in reserve
Player 2: 53 (51 draw, 2 discard)

Player 1, you are holding a 4D. Your move?
```

Type 2 to play the card on the second head. You will draw 3H, type 3. After 2 turns, your turn ends. Both heads have an extra card added on top of them.

Player 1, you are holding a 4D. Your move?
2

Heads:
2: 4D (2)
3: 10D (1)

Player 1: 51 (51 draw, 0 discard) + 1 in hand, 0 remaining, 0 in reserve
Player 2: 53 (51 draw, 2 discard)

Player 1, you are holding a 3H. Your move?
3

Heads:
2: 4D (2)
3: 3H (2)

Player 1: 51 (51 draw, 0 discard)
Player 2: 53 (51 draw, 2 discard)

Player 2, it is your turn

Press enter to advance. Player 2 has gotten a 10C. Type 0 to put it in reserve
Player 2, you are holding a 10H. Your move?
0

Heads:
2: 4D (2)
3: 3H (2)

Player 1: 51 (51 draw, 0 discard)
Player 2: 51 (49 draw, 2 discard) + 1 in hand, 0 remaining, 1 in reserve

Player 2 draws a QH. Type 0 again to swap it with the reserve. Type 0 again, you notice that it will fail, due to the user not being allowed to swap with reserve after swapping already. Type 3, you notice it is illegal, since 10>3 and it is not the first head. Type 2 to perform the cut off. Note that since queen was in the reserve, it returned to the drawpile, then was played due to the head cutting off.

Player 2, you are holding a QH. Your move?
0
Player 2, you are holding a 10H. Your move?
0
Invalid input, please try again.
Player 2, you are holding a 10H. Your move?
3
Invalid input, please try again.
Player 2, you are holding a 10H. Your move?
2

Heads:
3: 3H (2)

4: QH (1)
5: 6S (1)

Player 1: 51 (51 draw, 0 discard)
Player 2: 53 (48 draw, 5 discard)

Player 1, it is your turn

Press Enter to advance to player 1. Player 1 draws a 7C, try cutting off the third head (labeled 3). It fails due to there being another head that the user is allowed add a card to the fourth pile. Type 0 and save it as a reserve. You draw a QD. You can play it on the fourth head. But that ends the turn. Note that 7C is returned to Player 1's top of the draw pile.

Heads:
3: 3H (2)
4: QH (1)
5: 6S (1)

Player 1: 50 (50 draw, 0 discard) + 1 in hand, 2 remaining, 0 in reserve
Player 2: 53 (48 draw, 5 discard)

Player 1, you are holding a 7S. Your move?
3
Invalid input, please try again.
Player 1, you are holding a 7S. Your move?
0

Heads:
3: 3H (2)
4: QH (1)
5: 6S (1)

Player 1: 49 (49 draw, 0 discard) + 1 in hand, 1 remaining, 1 in reserve
Player 2: 53 (48 draw, 5 discard)

Player 1, you are holding a QD. Your move?
4

Heads:
3: 3H (2)
4: QD (2)
5: 6S (1)

Player 1: 50 (50 draw, 0 discard)
Player 2: 53 (48 draw, 5 discard)

Player 2, it is your turn

Press enter to advance (or any key then enter) . Player 2 draws a king. Type 0 to put it in reserve. Then player draws 8, play it on head 4. You will now draw an Ace. Type 4

Player 2, you are holding a KH. Your move?
0

Heads:
3: 3H (2)
4: QD (2)
5: 6S (1)

Player 1: 50 (50 draw, 0 discard)
Player 2: 51 (46 draw, 5 discard) + 1 in hand, 1 remaining, 1 in reserve

Player 2, you are holding a 8D. Your move?
4

Heads:
3: 3H (2)
4: 8D (3)
5: 6S (1)

Player 1: 50 (50 draw, 0 discard)
Player 2: 50 (45 draw, 5 discard) + 1 in hand, 0 remaining, 1 in reserve

Player 2, you are holding a AC. Your move?
4

Heads:
3: 3H (2)
4: AC (4)
5: 6S (1)

Player 1: 50 (50 draw, 0 discard)
Player 2: 51 (46 draw, 5 discard)

Player 1, it is your turn

Press enter or any key to advance. Note that Player 1 gets 7S because they reserved it last time. And at the end of the turn the card is then returned to the top of the pile. Anything can be placed on Ace. Type 0 to reserved the 7. Player 1 draws J. Type 4. They then draw a 3. Type 4 again.

Note: from here on there will be less explaining and mostly input to type.

Enter to advance as Player 2. Type 0, then Type 6 then Type 3. (reserve the king, invalid input and cut off the head). This demonstrates that the player's turn end immediately after cuttinig off a head

Enter to advance as Player 1. Type 0 then 5 then 6 then 6. Turn ends after 4 moves when there are four heads.

Enter to advance as Player 2. Then type 0 to reserve the 2. Here you draw a Joker. When Joker is prompt, it will just say "Joker". Type 5. Then type 5 for joker value. You see that it says invalid input, as one can not play 5 on a 4H. The system prompts the holding move again.
Heads:
4: 3S (6)
5: 4H (2)

6: 7C (3)
7: 6C (1)

Player 1: 45 (45 draw, 0 discard)
Player 2: 49 (41 draw, 8 discard) + 1 in hand, 2 remaining, 1 in reserve

Player 2, you are holding a Joker. Your move?
5
Joker value?
5
Invalid input, please try again.
Player 2, you are holding a Joker. Your move?

Type 6 then A, we see that the Joker now has a value of A and can be played on 7C.

Heads:
4: 3S (6)
5: 4H (2)
6: AJ (4)
7: 6C (1)

Player 1: 45 (45 draw, 0 discard)
Player 2: 48 (40 draw, 8 discard) + 1 in hand, 1 remaining, 1 in reserve

Player 2, you are holding a 6C. Your move?

Type these moves in order: 0 -> 6 -> 0 -> 7

Type: Enter -> 0 -> 7 -> 4

Press the eof (ctrl+D on maac) key to exit out. Note you can do this at any time.

You can test ./hydra -seed 2 to make sure that you get the same result to verify that -seed works.

Just because the demonstration would otherwise be way too long, I will just show the other features in snippets of logs instead of stepping through every single step. The full log for the following snippets will be in set3.txt, which allows you to reproduce the output. The program was run using ./hydra -seed 3

Note: [...] **means a bunch lines are skipped, skipped lines can be view in set3.txt**

How many players?
5

Heads:
1: 6H (1)

Player 1: 53 (53 draw, 0 discard)
Player 2: 54 (54 draw, 0 discard)
Player 3: 54 (54 draw, 0 discard)

Player 4: 54 (54 draw, 0 discard)
Player 5: 54 (54 draw, 0 discard)

Player 2, it is your turn

[...] (Feature demonstration for above lines: initiating game with 5 players).

Heads:
7: 2D (1)
8: 6D (2)
9: 10S (1)
10: 4H (4)
11: 7S (1)
12: 5C (5)
13: 2C (3)

Player 1: 42 (42 draw, 0 discard) + 1 in hand, 0 remaining, 0 in reserve
Player 2: 49 (47 draw, 2 discard)
Player 3: 56 (47 draw, 9 discard)
Player 4: 52 (49 draw, 3 discard)
Player 5: 53 (44 draw, 9 discard)

Player 1, you are holding a Joker. Your move?
9
Joker value?

Invalid input, please try again.
Invalid input, please try again.
Joker value?
2

Heads:
7: 2D (1)
8: 6D (2)
9: 2J (2)
10: 4H (4)
11: 7S (1)
12: 5C (5)
13: 2C (3)

[...] (Feature demonstration for above lines: Playing Joker as a 2).

Player 1, you are holding a KS. Your move?
37

Heads:
20: KD (7)
21: 2J (1)
22: 3D (4)
23: 3H (4)
24: 2C (2)
25: 2D (1)
26: 2H (1)

27: 2J (3)
28: 3C (2)
29: 2H (1)
30: 3S (7)
31: 8C (5)
32: 5S (4)
33: 7C (4)
34: 3C (2)
35: 2D (1)
36: 6S (2)
37: KS (5)
38: 10H (2)
39: 10S (3)

Player 1: 6 (0 draw, 6 discard) + 1 in hand, 9 remaining, 0 in reserve
Player 2: 54 (26 draw, 28 discard)
Player 3: 53 (22 draw, 31 discard)
Player 4: 47 (37 draw, 10 discard)
Player 5: 48 (31 draw, 17 discard)

Player 1, you are holding a 9C. Your move?
38

Heads:
20: KD (7)
21: 2J (1)
22: 3D (4)
23: 3H (4)
24: 2C (2)
25: 2D (1)
26: 2H (1)
27: 2J (3)
28: 3C (2)
29: 2H (1)
30: 3S (7)
31: 8C (5)
32: 5S (4)
33: 7C (4)
34: 3C (2)
35: 2D (1)
36: 6S (2)
37: KS (5)
38: 9C (3)
39: 10S (3)

Player 1: 5 (5 draw, 0 discard) + 1 in hand, 8 remaining, 0 in reserve
Player 2: 54 (26 draw, 28 discard)
Player 3: 53 (22 draw, 31 discard)
Player 4: 47 (37 draw, 10 discard)
Player 5: 48 (31 draw, 17 discard)

[...] (Feature demonstration for above lines: when Player 1 has 0 cards in his draw pile, his discard pile is then reshuffllled into the draw pile).

```
Player 1: 1 (1 draw, 0 discard) + 1 in hand, 4 remaining, 0 in reserve
Player 2: 54 (26 draw, 28 discard)
Player 3: 53 (22 draw, 31 discard)
Player 4: 47 (37 draw, 10 discard)
Player 5: 48 (31 draw, 17 discard)

Player 1, you are holding a 10S. Your move?
20

Heads:
20: 10S (10)
21: 2J (1)
22: 3D (4)
23: 3H (4)
24: 2C (2)
25: 2D (1)
26: 2H (1)
27: 2J (3)
28: 3C (2)
29: 2H (1)
30: 3S (7)
31: 8C (5)
32: 5S (4)
33: 7C (4)
34: 3C (2)
35: AC (2)
36: 2S (3)
37: KS (5)
38: 9C (3)
39: 10S (3)

Player 1: 0 (0 draw, 0 discard) + 1 in hand, 3 remaining, 0 in reserve
Player 2: 54 (26 draw, 28 discard)
Player 3: 53 (22 draw, 31 discard)
Player 4: 47 (37 draw, 10 discard)
Player 5: 48 (31 draw, 17 discard)

Player 1, you are holding a 2H. Your move?
20
Player 1 wins!
```

(Feature demonstration for above lines: Player 1 wins after spending all his cards).

-testing flag

By passing -testing as a command line argument, you can activate testing mode.

Example:

```
./hydra -testing
```

How many players?
2
Card Value?
E
Card Value?
K
Suit?
mom
Suit?
S

Heads:
1: KS (1)

Player 1: 53 (53 draw, 0 discard)
Player 2: 54 (54 draw, 0 discard)

Player 2, it is your turn

[...] (Demonstration: when initializing under the testing mode, it will ask the user to input card and suit value, invalid card and suit value will be answered with another prompt.)

Heads:
1: 6H (3)

Player 1: 52 (52 draw, 0 discard)
Player 2: 52 (52 draw, 0 discard) + 1 in hand, 0 remaining, 0 in reserve

Card Value?
Joker
Player 2, you are holding a Joker. Your move?
1
Joker value?
7
Card Value?
7
Suit?
D
Card Value?
8
Suit?
D

Heads:
2: 7D (1)
3: 8D (1)

Player 1: 52 (52 draw, 0 discard)
Player 2: 54 (50 draw, 4 discard)

Player 1, it is your turn

[...] (Demonstration: Testing mode telling the user to specify a value when drawing a card. Joker is not universal and will cut a head if user sets it to a value that can’t be played on top of

any head. After the Joker value? Prompt and user responds with 7, the head is cut off, two more joins its place. So the testing mode asks for two more cards to input, in this case, the user enters 7D and 8D)

Heads:
3: 6D (3)
4: 3D (1)
5: 7D (2)

Player 1: 47 (47 draw, 0 discard) + 1 in hand, 0 remaining, 0 in reserve
Player 2: 54 (47 draw, 7 discard)

Card Value?
Joker
Player 1, you are holding a Joker. Your move?
4
Joker value?
4
Invalid input, please try again.
Card Value?
Joker
Player 1, you are holding a Joker. Your move?
5
Joker value?
6

[...] (Demonstration: Joker can also be set to a value such that playing it will be an invalid input. In this case the testing mode asks for the user for the card value again)

Player 1: 0 (0 draw, 0 discard) + 1 in hand, 4 remaining, 0 in reserve
Player 2: 58 (29 draw, 29 discard)

Card Value?
A
Suit?
D
Player 1, you are holding a AD. Your move?
0

Heads:
9: 9D (31)
10: 9D (9)
11: 9D (1)
12: 9D (1)
13: 9D (1)
14: 9D (3)
15: 9D (1)
16: 9D (1)
17: 9D (1)

Player 1: 1 (1 draw, 0 discard)
Player 2: 58 (29 draw, 29 discard)

Player 2, it is your turn

[...] (Demonstration: If the user has a card in reserve (player 1 moved AD to reserve) and when there is no card draw/discard pile, reserve card returns to player draw pile and turn ends)

```
Heads:
11: 9D (1)
12: 9D (1)
13: 9D (1)
14: 9D (3)
15: 9D (1)
16: 9D (1)
17: 9D (1)
18: 9D (1)
19: 9D (1)
20: 9D (1)
21: 9D (1)

Player 1: 0 (0 draw, 0 discard) + 1 in hand, 10 remaining, 0 in reserve
Player 2: 94 (22 draw, 72 discard)

Card Value?
10
Suit?
D
Player 1, you are holding a 10D. Your move?
11
Card Value?
9
Suit?
D
Card Value?
9
Suit?
D
Player 1 wins!
```

[...] (Demonstration: win by cutting off a head)

Additional features:

No additional features. (eof character to end program immediiately kind of counts? Also all memory are handled using STL containers and smart pointers. No memory leaks should occur).