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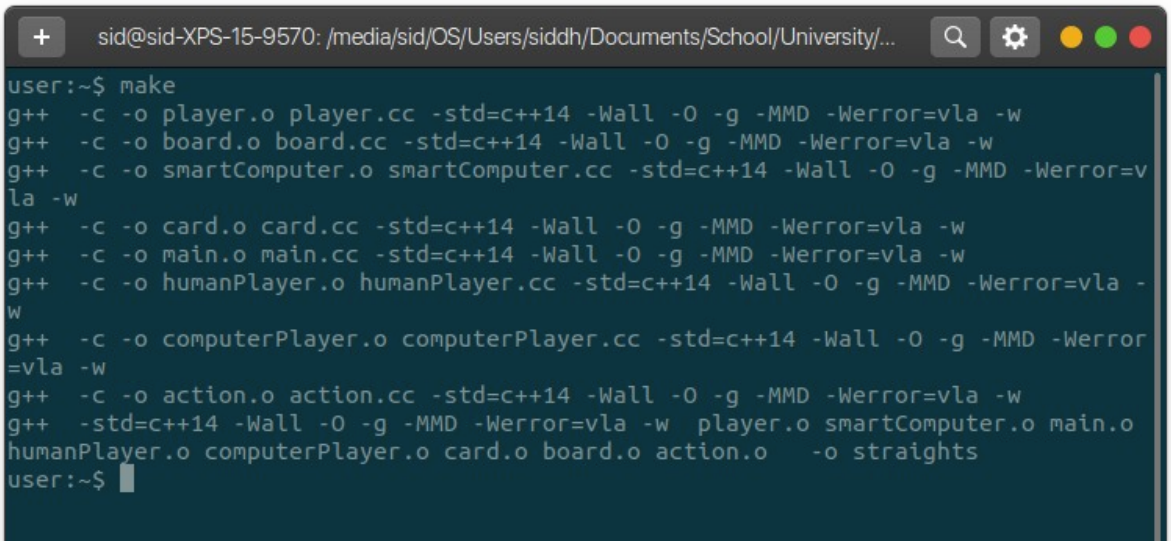
Demo Plan

Note: you will be able to replicate all scenarios by following the typed instructions in this document. Screenshots are included to help guide you with your testing. Enjoy!

This demo document will take you through a tour of the various features implemented in this project.

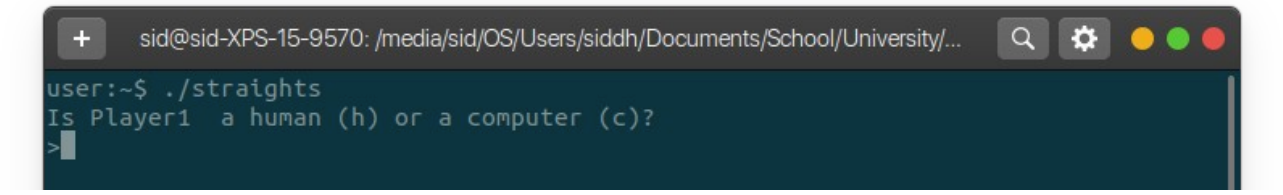
CORE REQUIREMENTS:

You can compile the program by running the make command as such:

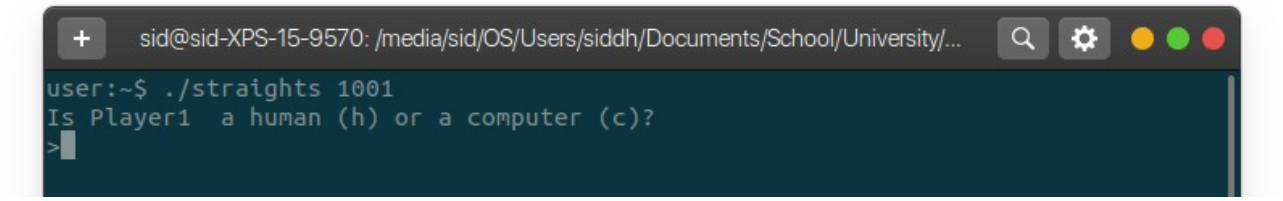


At this stage, the executable “straights” will be built in the current directory. This executable is fully compliant with the program specification in straights.pdf, and implements all required features completely.

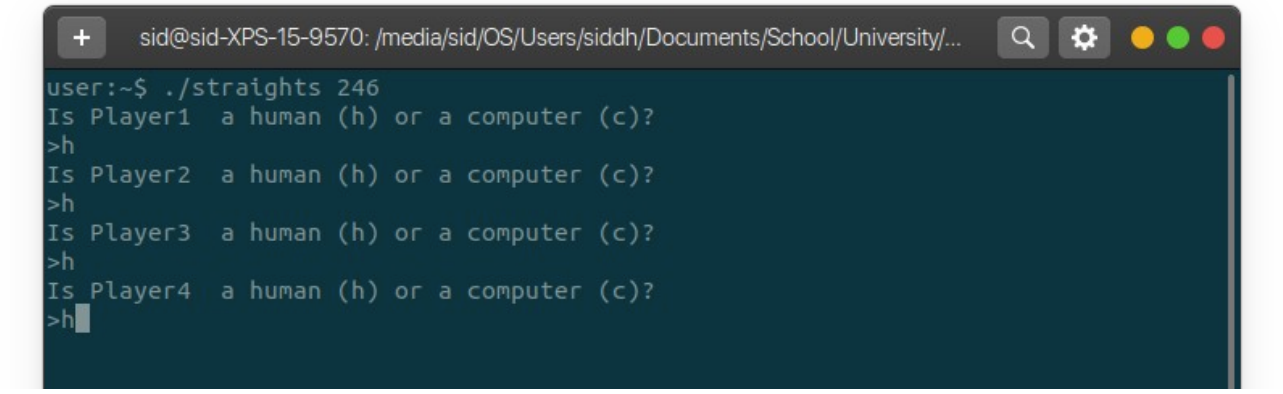
To run the program without a specified seed, a constant internal seed will we used and the program can be called as such:



To run straights with a specified seed, simply enter a numeric seed as the first command-line option. For example:



For now, we will use the seed 246. Initialize all player to be human:



You will notice it will start the game with Player4 since they have the 7 of spades:

```
>h
Is Player4  a human (h) or a computer (c)?
>h
A new round begins. It's Player4's turn to play.
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades:
Your hand: 6S 4S 8S 5C KD KS JH QH AH 8D 7D 9H 7S
Legal plays: 7S
>
```

You will notice that the only legal play is 7S since it is the first play of the round (even though there exists another usually valid card: 7D in the user's hand).

Note the following cases in which the user inputs invalid moves and the program's response:

"discard 6S" is invalid since there is a legal play:

```
Hearts:
Spades:
Your hand: 6S 4S 8S 5C KD KS JH QH AH 8D 7D 9H 7S
Legal plays: 7S
>discard 6S
You have a legal play. You may not discard.
>
```

"play 7D" is invalid since the user must play the 7S on the first play of the round:

```
Hearts:
Spades:
Your hand: 6S 4S 8S 5C KD KS JH QH AH 8D 7D 9H 7S
Legal plays: 7S
>discard 6S
You have a legal play. You may not discard.
>play 7D
This is not a legal play.
>
```

“play 7SS” is invalid since 7SS does not represent a valid card:

```
Legal plays: 7S
>discard 6S
You have a legal play. You may not discard.
>play 7D
This is not a legal play.
>play 7SS
This is not a legal play.
>
```

“random” is invalid since it is not a supported command:

```
>random
Invalid command: random. Please make your selection again
>
```

Also note the deck command produces the state of the shuffled deck:

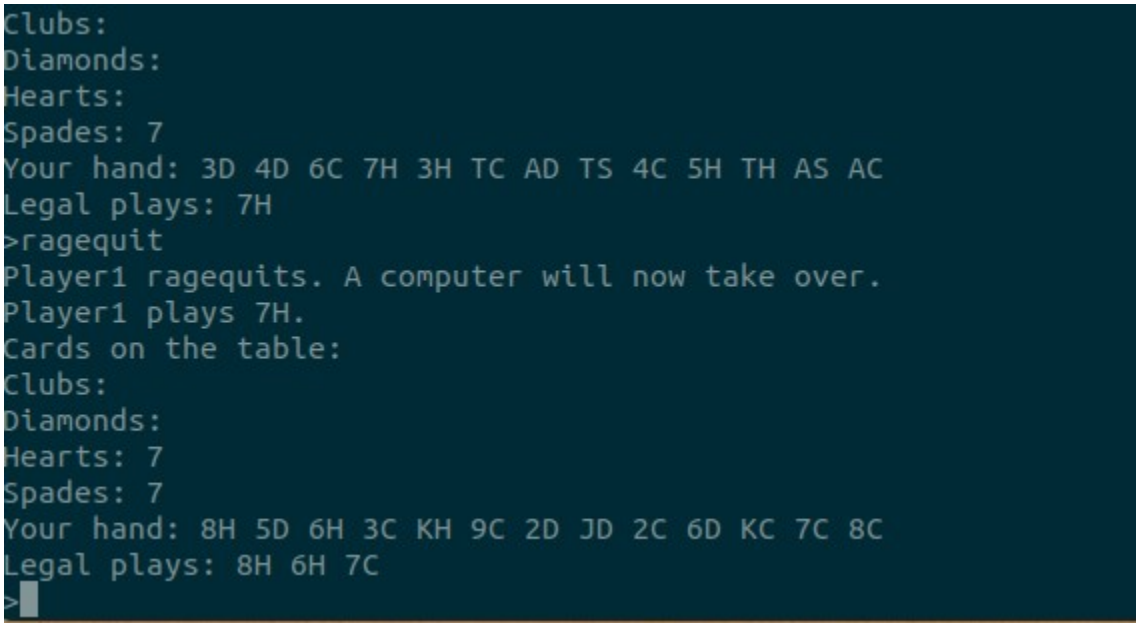
```
>play 7SS
This is not a legal play.
>random
Invalid command: random. Please make your selection again
>deck
3D 4D 6C 7H 3H TC AD TS 4C 5H TH AS AC
8H 5D 6H 3C KH 9C 2D JD 2C 6D KC 7C 8C
QC TD 2S 5S JC QS 3S 9S JS QD 4H 9D 2H
6S 4S 8S 5C KD KS JH QH AH 8D 7D 9H 7S
>
```

Since the cards are dealt to the players 13 at a time, the bottom row corresponds to the cards dealt to player 4 (as can be seen in the “Your hand: ...” line printed above).

Continuing with the game, we will play the 7S:

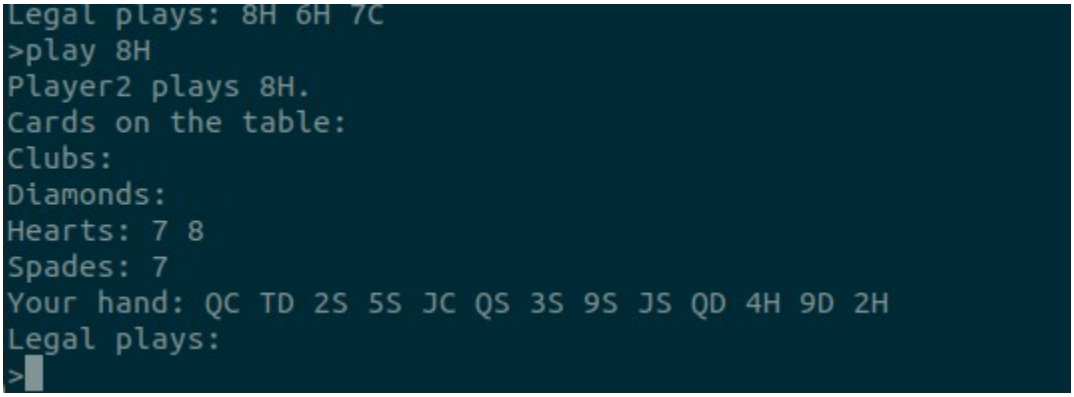
```
>play 7S
Player4 plays 7S.
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: 3D 4D 6C 7H 3H TC AD TS 4C 5H TH AS AC
Legal plays: 7H
>
```

The game continues to Player1. Notice, the spades line for cards on the table lists the 7S played by Player4 on the previous turn. Let's have Player1 ragequit using the "ragequit" command:



Notice program notifies the user of the replacement of Player1 with a computer. Then, the computer plays the only legal play (as seen in the printed line: "Legal plays: ..."): 7H.

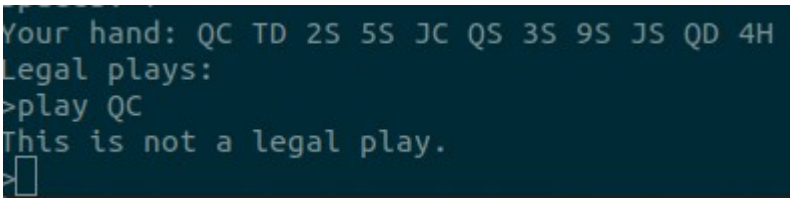
On Player2's turn, play 8H:



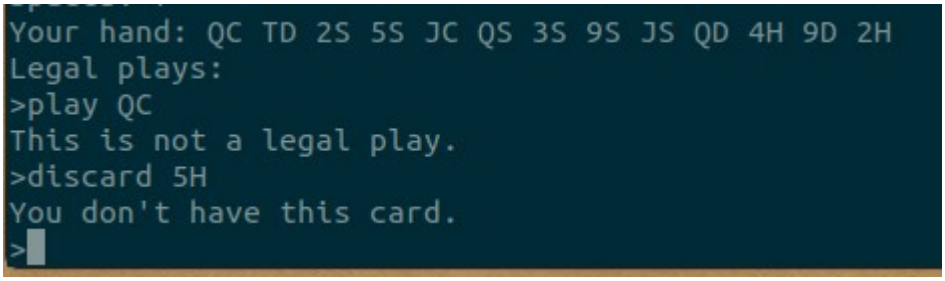
On Player3's turn, it can be seen that the "Hearts: ..." line is correctly populated with 7 and 8. Additionally, Player3 is forced to discard as they don't have any legal card.

Consider the following invalid move cases and program reponses during a discard move:

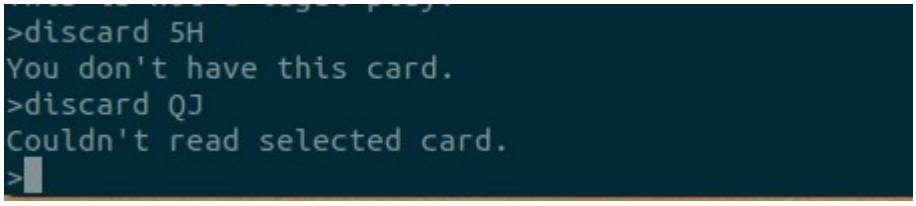
“play QC” invalid since there are no legal plays:



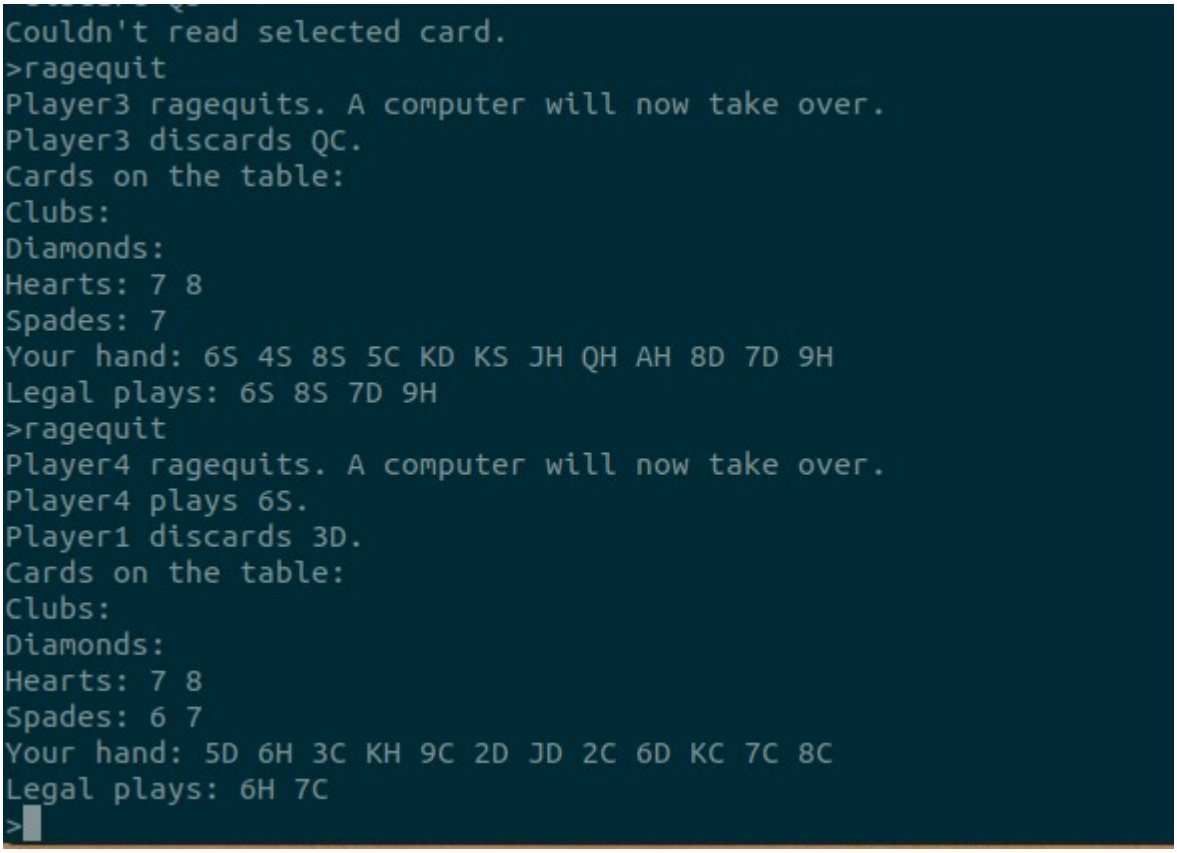
“discard 5H” invalid since the player does not own that card:



“discard QJ” invalid since such a card does not exist:



Now, we will ragequit Players3 and 4 to speed up the gameplay:

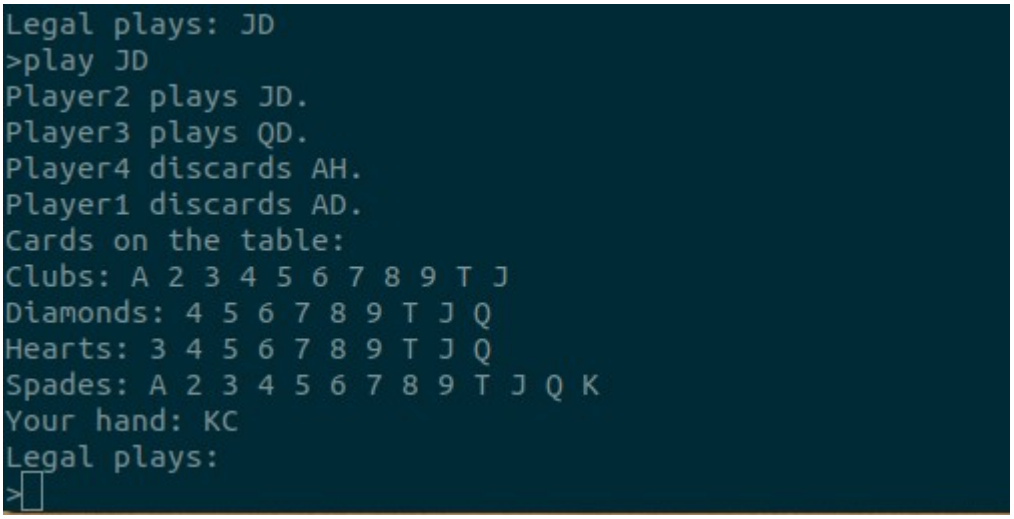


Note, Player3 discarded the first card as per the specification for computer players. Likewise Player4 follows the same specification. Also note the order of the “Legal plays: ...” list is sorted by the cards’ appearance in the players’ hand.

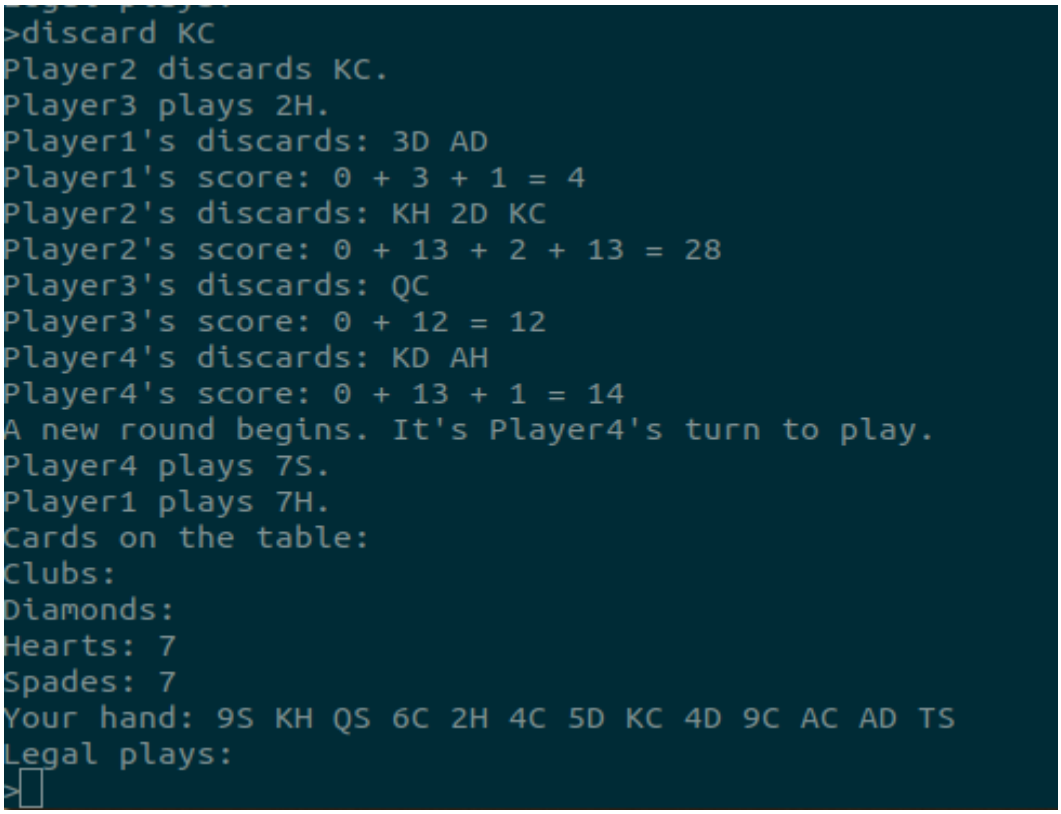
As Player2, will will make the following moves:

play 6H
play 7C
play 8C
play 3C
play 9C
play 2C
play 6D
play 5D
discard KH
discard 2D
play JD

Now, this is the state of the game after “play JD”:

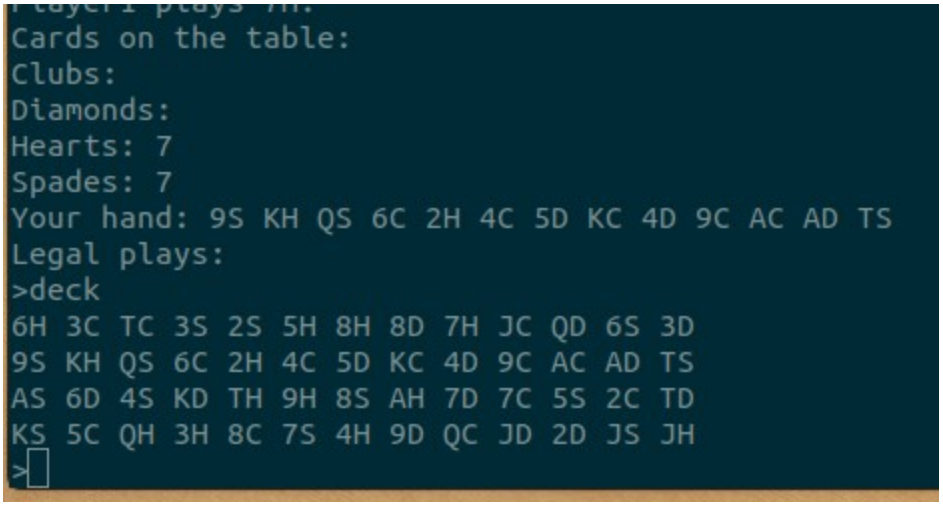


Note, as the gameplay progresses the “Cards on the table” list expands as players play cards. Since there is only one card left in the player’s hand, this represents the last move of the round. We will “discard KC” and receive the following output:

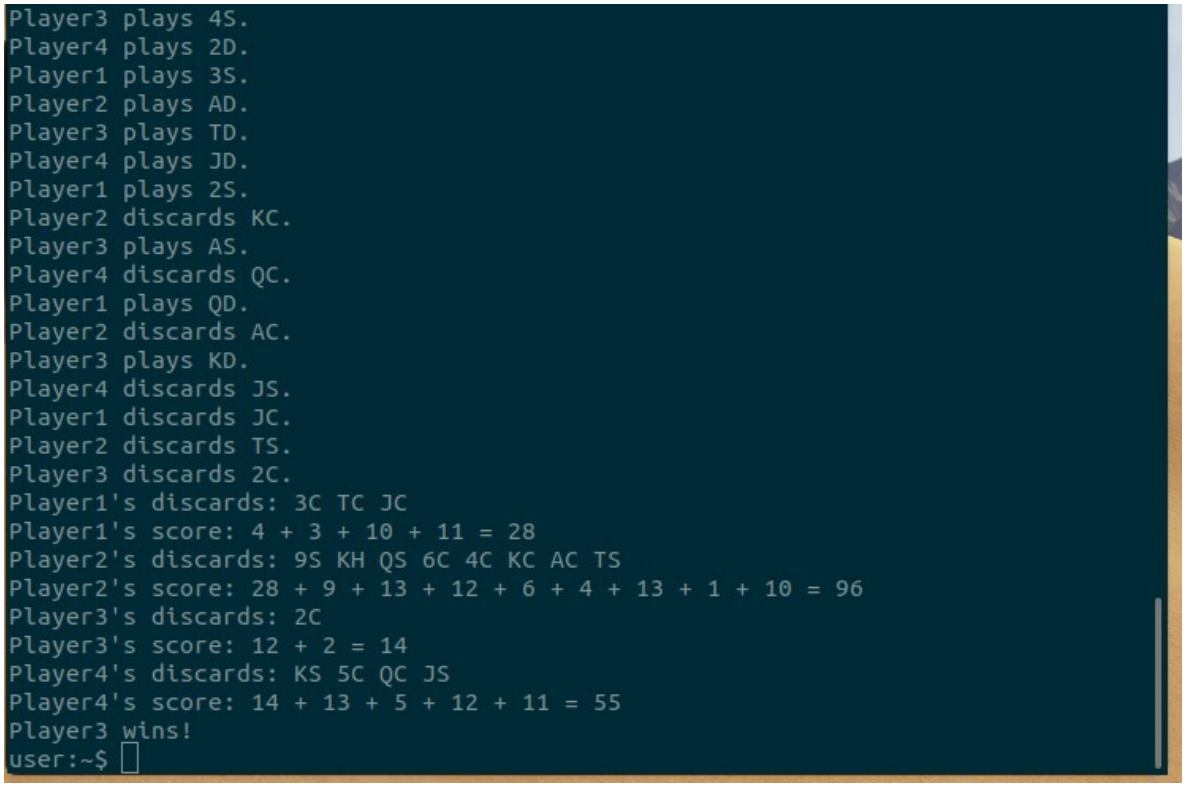


At the end of the round, the program lists each player's discards and their associated score. Note, the initial "0 + ..." in the calculation represent the prior rounds' score sum, which is 0 on the first round.

In this new round, run the "deck" command to see the state of the shuffled deck:

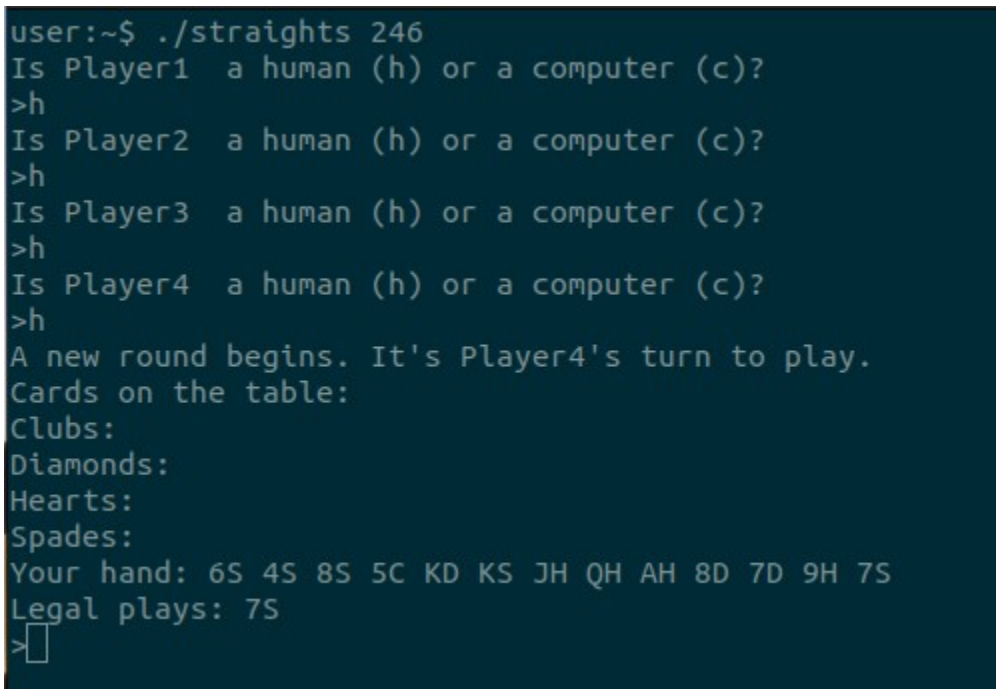


Notice, this deck is shuffled from its previous state (this can be verified by comparing against the output of the previous deck command). We will ragequit Player2 in order to speed up the game and let the computer players complete the rest of the game.

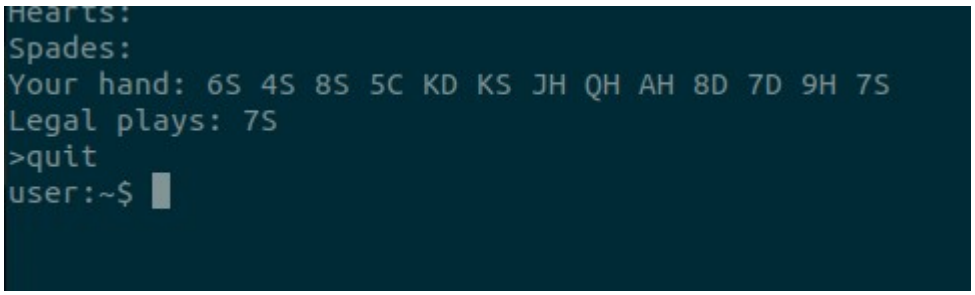


In the screenshot above, we can see the sum of this round's discards with the prior rounds' scores. In this round, player2's reaches 96, and it crosses the 80 threshold, ending the game. Since Player3 has the lowest score (14), they win. If multiple players have the same lowest score, the "Player<x> wins!" statement will be printed for each of them.

To demonstrate the "quit" functionality, start a new game with seed 246 and fill it with humans:

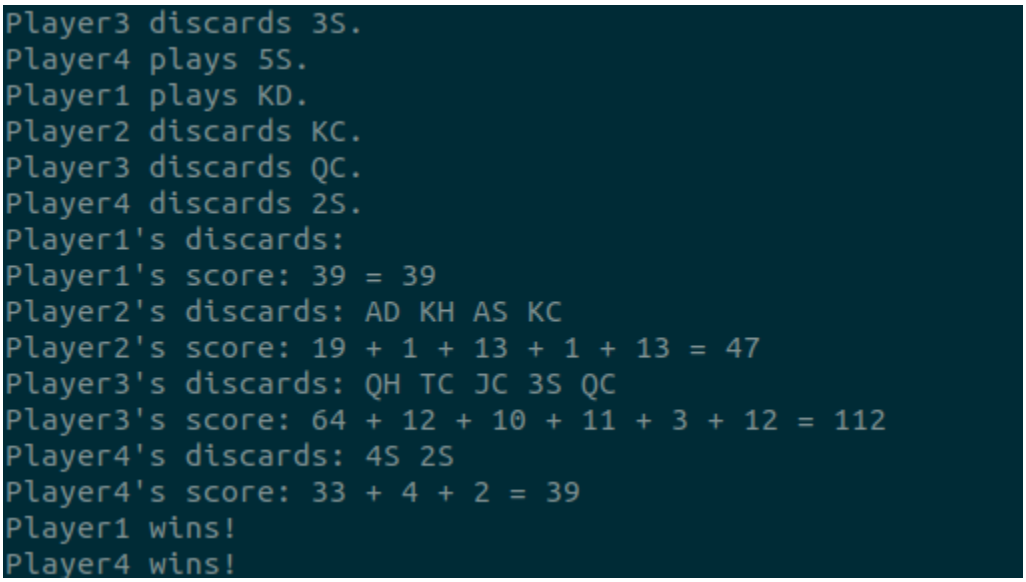


Now, use the “quit” command to end the game:



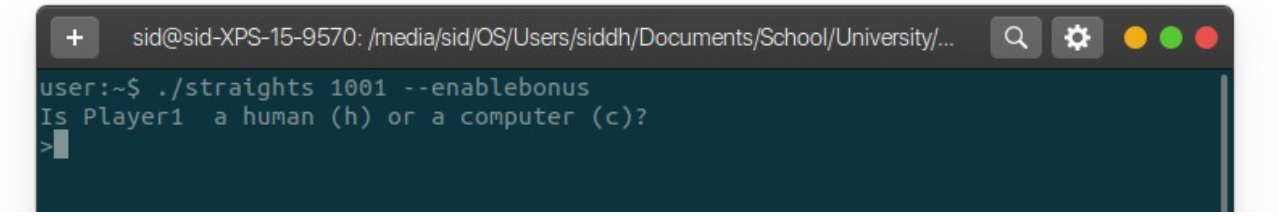
This is also enabled to read the GNU/Linux-style <Ctrl-D> end-of-file signal and interpret it as a “quit” message. This process does not lead to any leaked memory.

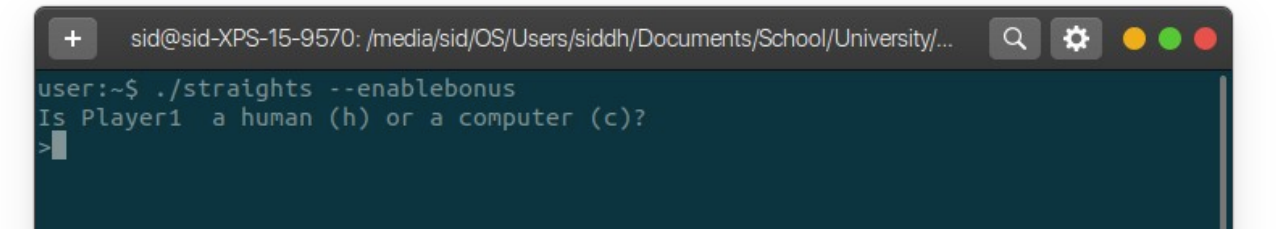
To see the handing of a tied-score scenario, run the program with the seed 13 (i.e. run “./straights 13”) with all computer players. You will notice players 1 and 4 have the same score: 39, which happens to be the lowest score. The program prints the winners as such:



BONUS FEATURES:

To enable bonus features, use the “--enablebonus” flag either after the seed or alone as such:





The following bonus features are implemented:

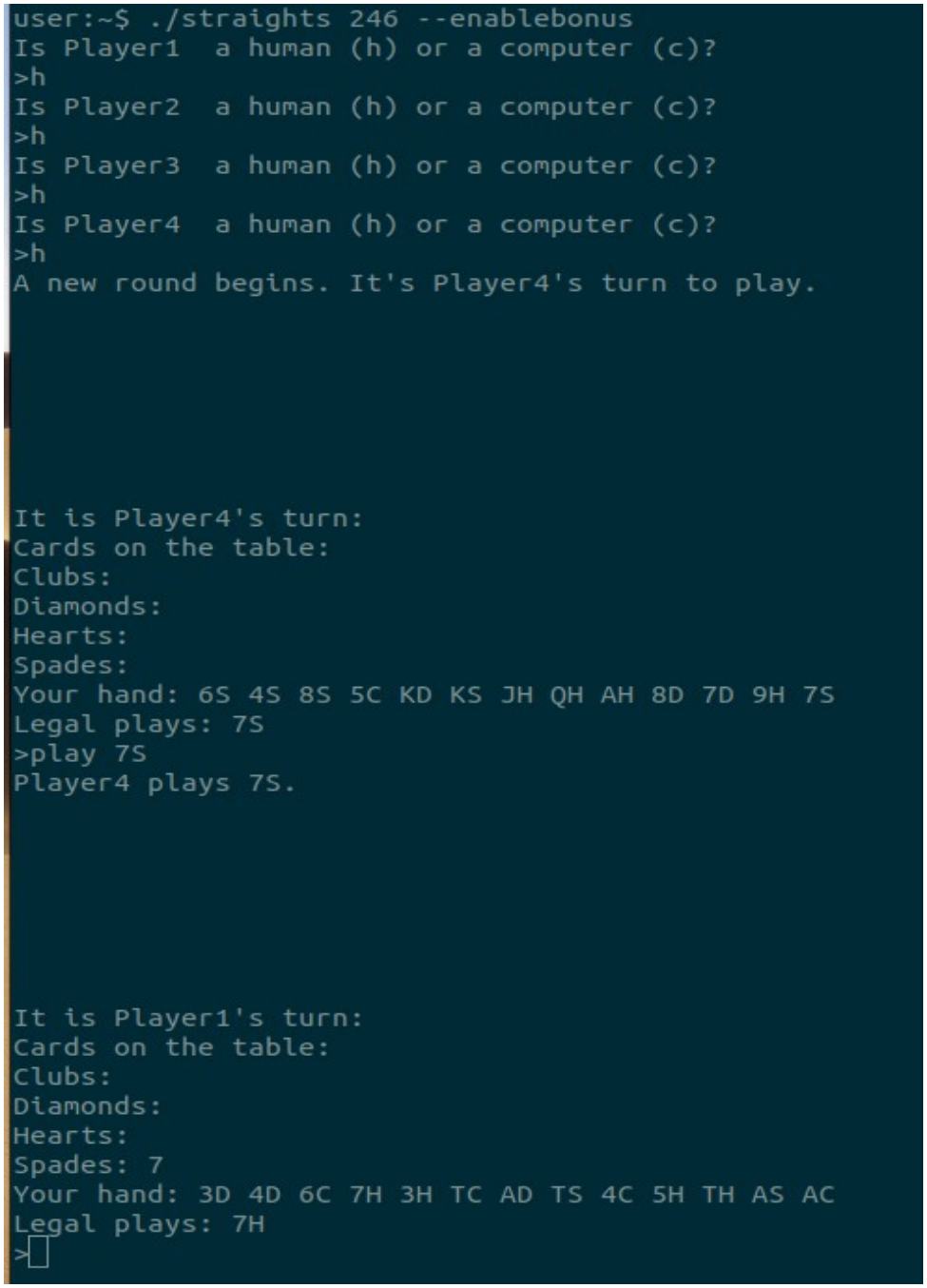
- Project completed without explicitly managing memory and no memory leaks
- Smarter computer player algorithms
- Clearer player turns (UX)
- A new “imtired” command which allows ending the game early

In the bonus version of the program, the computer players use a new strategy when choosing how to play:

- If there exists a legal play, play the card with the highest rank as to dispose of the high risk of having to discard it
- If there does not exist a legal play, discard the card with the lowest ranks as to add the lowest value to the discard sum, and "live to fight another day" and potentially play the high-rank cards later in the round

This simple change makes the computer opponents more difficult to win against. In the demo ahead, keep an eye out for computer players generally playing higher than usual cards, and generally discarding lower than usual cards.

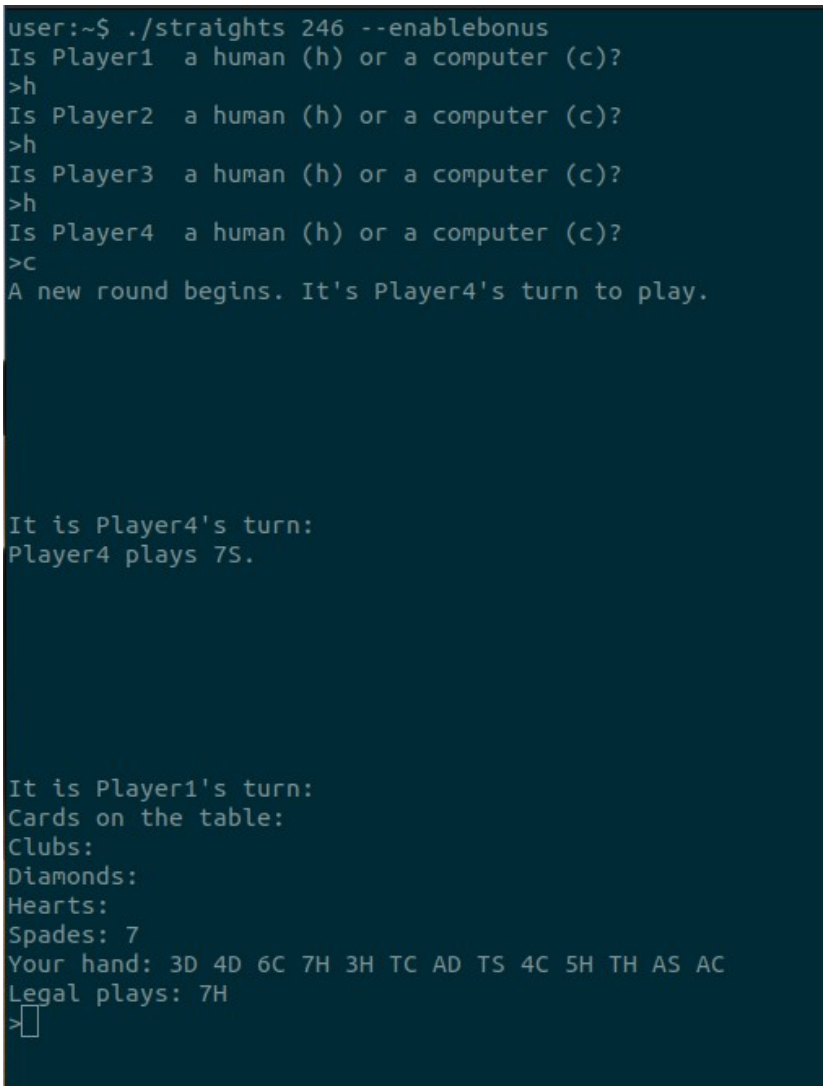
For the purposes of this demo, use the command “./straights 246 --enablebonus” to run the program and set all players to be human.
Run the command “play 7S” for player4:



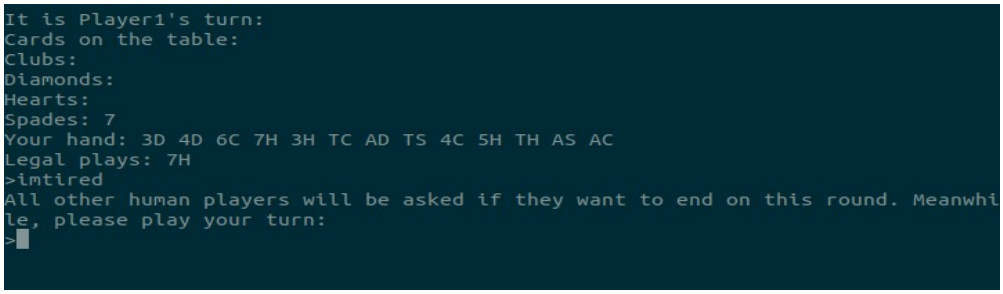
Notice, there is now spacing between player turns, alongside a header with the player whose turn it is. In my experience playing this game, it sometimes got confusing what was going on. Some spacing and headers greatly improve the user experience. This makes it easier for Player1 to differentiate between player4 and player1’s respective information.

Quit the running game using the “quit” command.

Another bonus implementation is the “imtired” command which allows players to end the game on the current round. Start a new game with the same command (./straights 246 –enablebonus). Initialize Players 1, 2, and 3 to be human and Player 4 to be a computer:



Suppose Player1 is getting tired of the game, but does not want to ragequit and rather end the game early, then Player1 can issue the command “imtired” to initiate a poll asking all other players if they want to end the game this round. Take a look by issuing the command “imtired”:



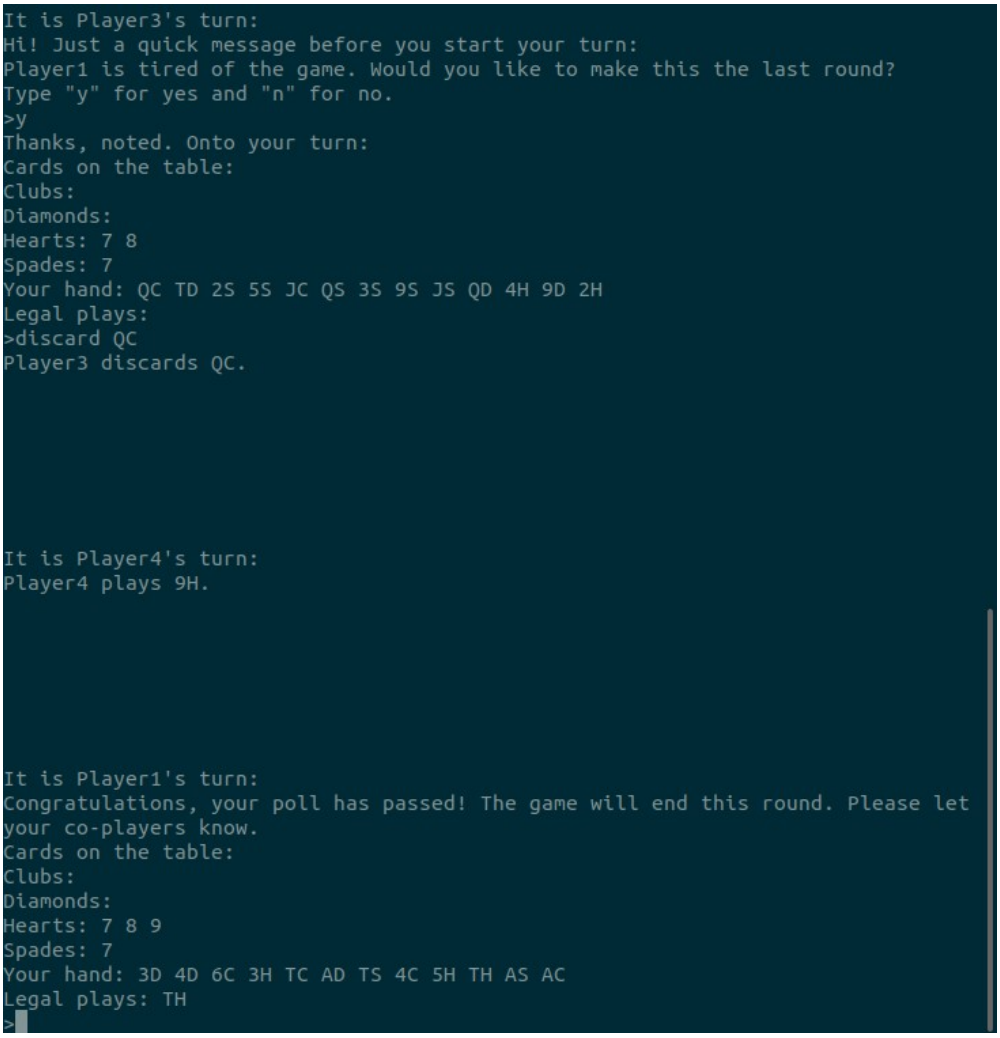
Now, player1 will play their turn as usual by playing “play 7H”:

```
It is Player1's turn:
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: 3D 4D 6C 7H 3H TC AD TS 4C 5H TH AS AC
Legal plays: 7H
>imtired
All other human players will be asked if they want to end on this round. Meanwhi
le, please play your turn:
>play 7H
Player1 plays 7H.




It is Player2's turn:
Hi! Just a quick message before you start your turn:
Player1 is tired of the game. Would you like to make this the last round?
Type "y" for yes and "n" for no.
>
```

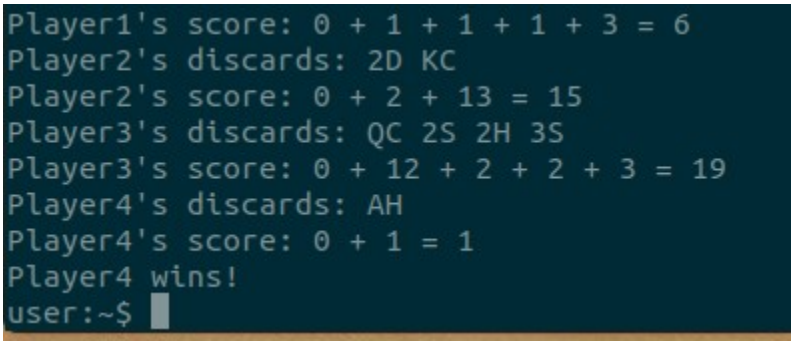
Right before Player2’s turn, they are notified of Player1’s intentions and can contribute to the poll. For now, let Player2 type “y” for yes and “play 8H” on their turn:

```
It is Player2's turn:
Hi! Just a quick message before you start your turn:
Player1 is tired of the game. Would you like to make this the last round?
Type "y" for yes and "n" for no.
>y
Thanks, noted. Onto your turn:
Cards on the table:
Clubs:
Diamonds:
Hearts: 7
Spades: 7
Your hand: 8H 5D 6H 3C KH 9C 2D JD 2C 6D KC 7C 8C
Legal plays: 8H 6H 7C
>play 8H
Player2 plays 8H.




It is Player3's turn:
Hi! Just a quick message before you start your turn:
Player1 is tired of the game. Would you like to make this the last round?
Type "y" for yes and "n" for no.
>
```

Likewise, Player3 is notified. Let Player 3 also type “y” for yes, and then “discard QC”:



Player 1 is notified of the passing of the poll and that the game will end this round. To quickly wrap up, have all players ragequit, and note the end of round/game message:



Even though no player crossed the 80 point threshold for ending the game, the “imtired” command allowed the game to finish in only one round.

Other potential cases and program handling for “imtired” command:

Typo in response:

```
It is Player1's turn:
Hi! Just a quick message before you start your turn:
Player4 is tired of the game. Would you like to make this the last round?
Type "y" for yes and "n" for no.
>blahblah
You made a typo... sound like you're tired!
```

The program treats typos as a “y” vote primarily for humour.

Someone does not want to end the game:

```
It is Player4's turn:
Unfortunately not all players are tired, so you will have to keep playing or qui
t
```

Notifies the player who began the poll of the status.

Someone runs the command “imtired” during a running poll:

```
Thanks, noted. Onto your turn:
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: 3D 4D 6C 7H 3H TC AD TS 4C 5H TH AS AC
Legal plays: 7H
>imtired
A tiredness poll is happening this round. Please wait.
>
```

Notifies the player of the status and asks them to wait until later.

Attempting the command without the “--enablebonus” command line program flag:

```
A new round begins. It's Player4's turn to play.
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades:
Your hand: 6S 4S 8S 5C KD KS JH QH AH 8D 7D 9H 7S
Legal plays: 7S
>imtired
Unfortunaely since you have opted to play without bonuses, you will have to sit
this one through (or quit).
>
```

Notifies the player of the bonus-state and some alternate options.