DEMO

CS246 FINAL PROJECT

STRAIGHT

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Step 1: Guide to go through the demo

In this demo, I will introduce how this Straight card game behaves. Because it has a text interface, there will be some commands that is needed to type by you. All the commands that needed you to type will be `in another font size and in orange color`.

On the other hand, since the deck is shuffled "randomly", so although the game and the behavior in this demo can be apply into your trial when playing the game, the cards appeared maybe different, and there are some edge cases that may not appear in your trial.

I will go through each section and command, then show you the behavior/exception handling for each case before show you the "right" command to move on the next section. The commands I will consider are:

`play <card>`

`discard <card>`

`deck`

`quit`

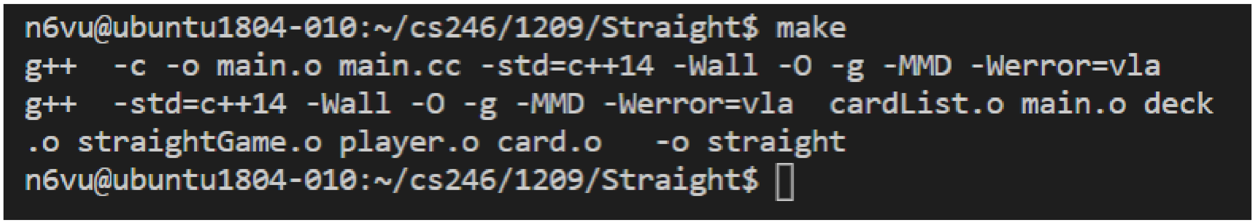
`ragequit`

Step 2: Guide to compile and run the game

In your terminal, navigate to the folder of the file. Compile the game by typing:

`make`

The result should be like this:



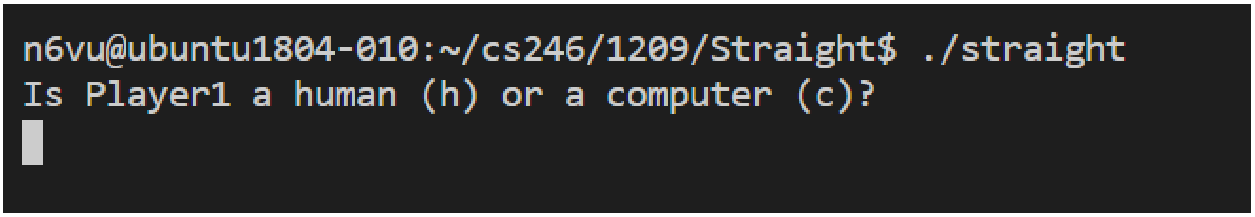
```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ make
g++  -c -o main.o main.cc -std=c++14 -Wall -O -g -MMD -Werror=vla
g++  -std=c++14 -Wall -O -g -MMD -Werror=vla  cardList.o main.o deck
.o straightGame.o player.o card.o   -o straight
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ 
```

Step 3: Run the game with seed

After compiling, we will run the executable file named “straights”. There are options running the file with or without seed.

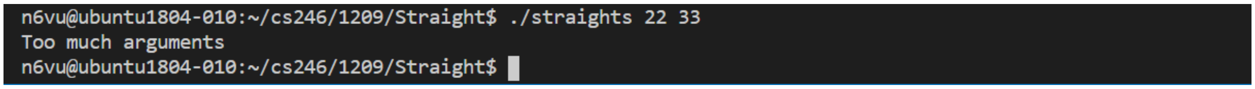
This is an example command to run without a seed:

```
./straight
```



```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straight
Is Player1 a human (h) or a computer (c)?
```

And below is what happened when we have more than two seeds: the program terminated with a warning message.

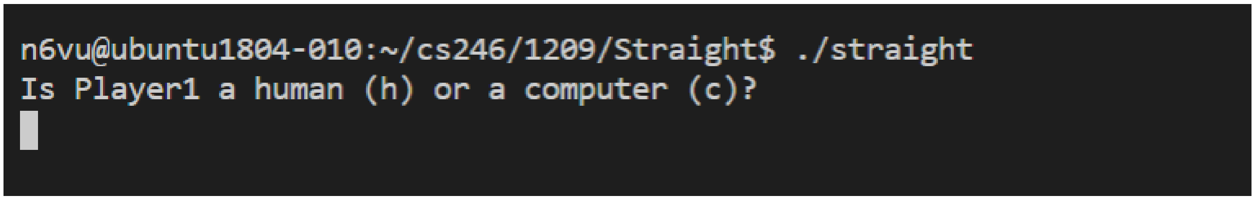


```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straights 22 33
Too much arguments
n6vu@ubuntu1804-010:~/cs246/1209/Straight$
```

Now we will run the game by typing:

```
./straight 3
```

The result should be like this:

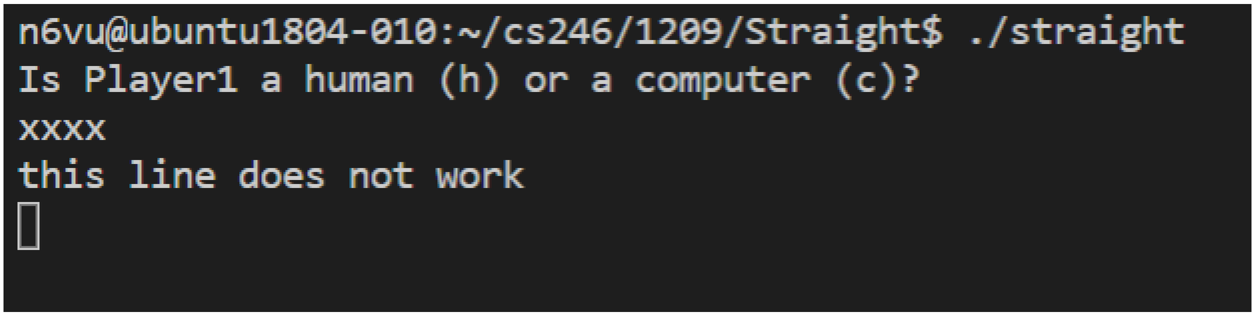


```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straight
Is Player1 a human (h) or a computer (c)?
```

Step 4: Assign player

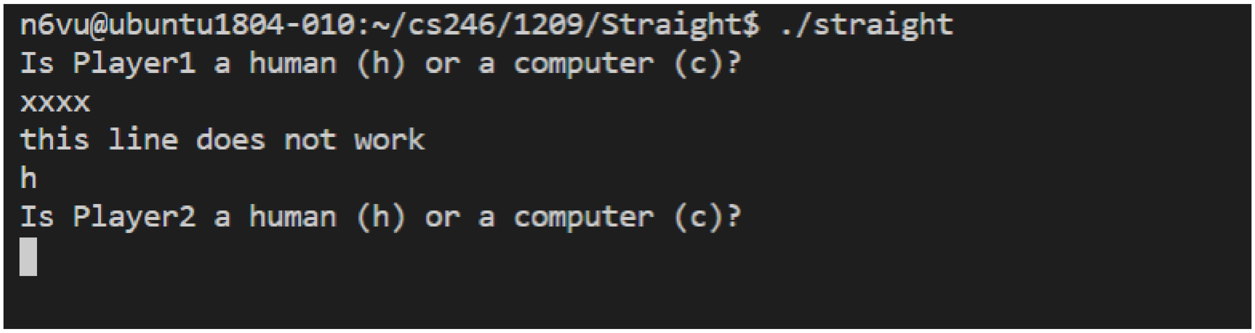
In this step, we will assign player according to how many human player is available. The interface for assigning is as the last figure. The game will ask you four times in total, to assign Player1, Player2, Player3, Player4 respectively. You can either type the “correct” command is either `h` or `c`. nothing will appear until you type these commands.

In the picture below, I type random commands, such as “xxxx” and “this line does not work”. Nothing happens.



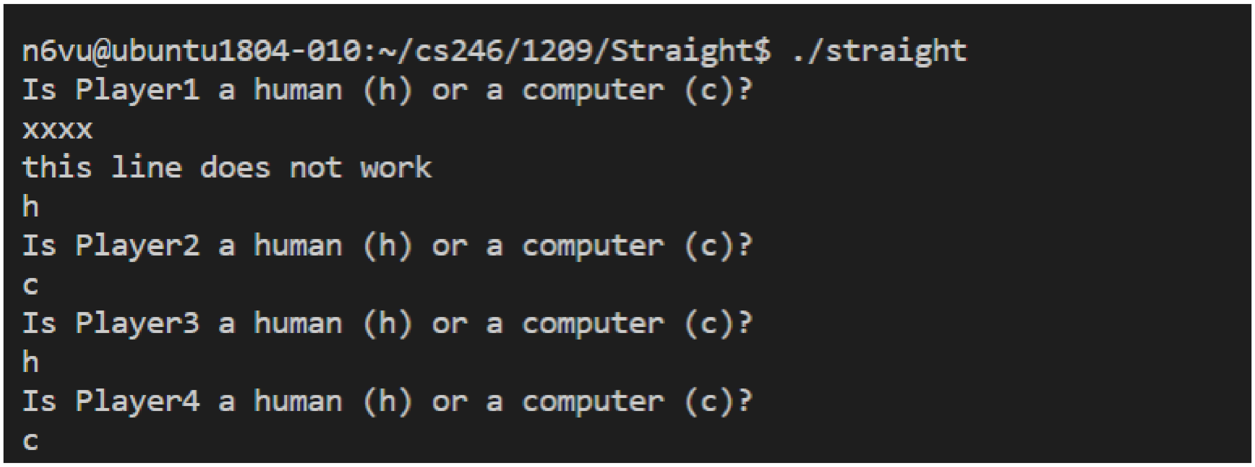
```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straight
Is Player1 a human (h) or a computer (c)?
xxxx
this line does not work
```

Now, if I type `h`, indicate Player1 will be a human, the program will move on to ask me the next step:



```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straight
Is Player1 a human (h) or a computer (c)?
xxxx
this line does not work
h
Is Player2 a human (h) or a computer (c)?
```

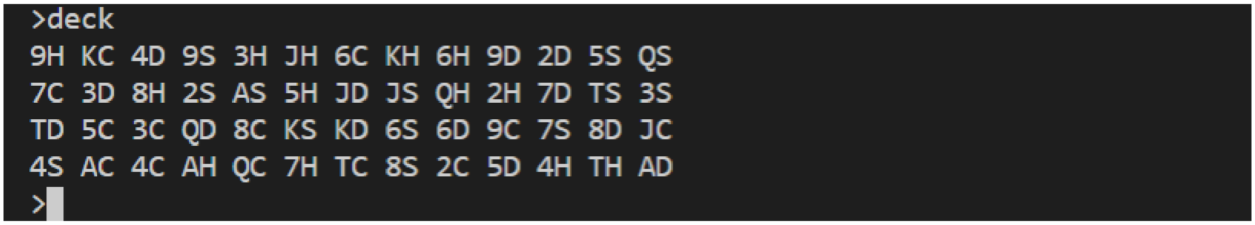
Similarly, if I type `c`, means I want to have a computer playing as Player2 for me, the program will also move on to the next step. I will assign Player3 as human and Player4 as computer respectively as well.



```
n6vu@ubuntu1804-010:~/cs246/1209/Straight$ ./straight
Is Player1 a human (h) or a computer (c)?
xxxx
this line does not work
h
Is Player2 a human (h) or a computer (c)?
c
Is Player3 a human (h) or a computer (c)?
h
Is Player4 a human (h) or a computer (c)?
c
```

We now done the assign player section. The computer will sort the deck to “AC 2C 3C … QD KD” order, then shuffle it based on time, and assigned 13 cards to each player.

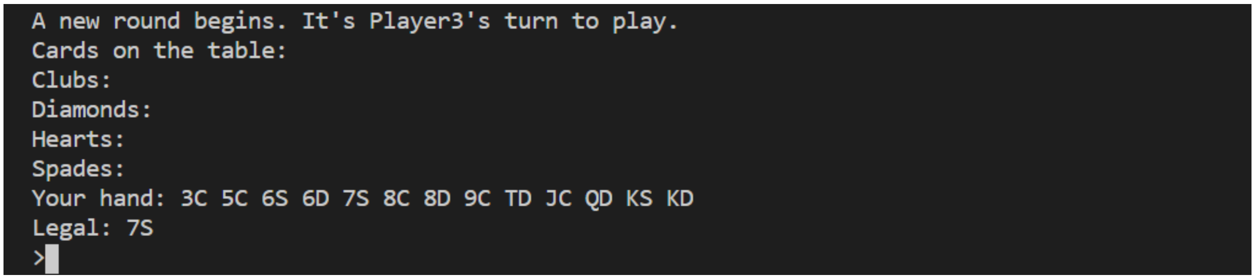
You can check if the computer assign cards properly to the correct player by typing “deck” at any points during the game. There will be four lines of cards appeared. The first line is Player1’s cards, the 2nd line is Player2’s. etc. Notice that the card appeared is unordered, when the card in your hand is.



```
>deck
9H KC 4D 9S 3H JH 6C KH 6H 9D 2D 5S QS
7C 3D 8H 2S AS 5H JD JS QH 2H 7D TS 3S
TD 5C 3C QD 8C KS KD 6S 6D 9C 7S 8D JC
4S AC 4C AH QC 7H TC 8S 2C 5D 4H TH AD
>
```

Step 5: Starting a round

A new message is now appear:



```
A new round begins. It's Player3's turn to play.
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades:
Your hand: 3C 5C 6S 6D 7S 8C 8D 9C TD JC QD KS KD
Legal: 7S
>
```

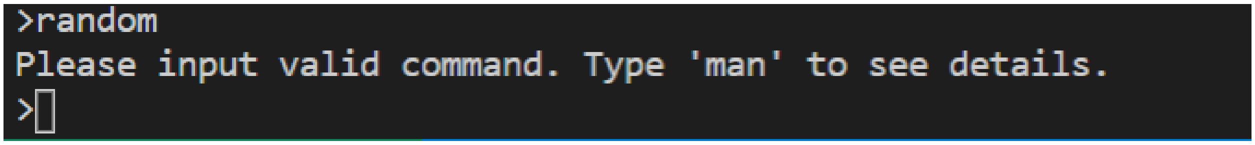
Figure: table display and command for Human player

As we have seen, it is the beginning, so there are no cards on the table. The game assigned Player3 as the first player because it owns the "7S" card, because the only legal card on the table at the beginning is 7S. Since Player3 is Human, there is a ">" symbol appeared, indicate that it is waiting for a command.

Step 6: Legal commands and exception handles for non-legal commands

The only legal commands are "play <card>", "discard <card>", "deck", "quit", "ragequit", and "man". When a non-legal command is typed, the message appear:

`Random`



```
>random
Please input valid command. Type 'man' to see details.
>
```

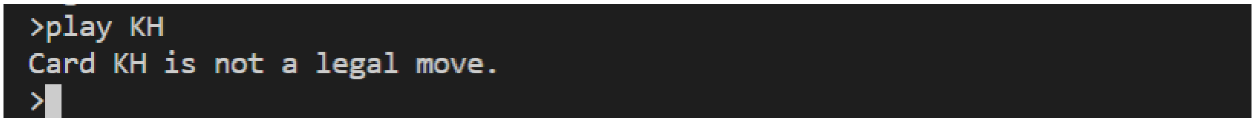
The game shows a warning message and wait for a legal command

Step 7: The `play` command and its exception handles

The game asks you to type a valid command. As you have seen, the valid commands are "play <card>", "discard <card>", "deck", "quit" and "ragequit". We now focus on the "play" and "discard" command. We fist focus on the game exception.

Since there is a legal card (7S), by the rule, you should play that card. This is what happened when you play a card that you do not have:

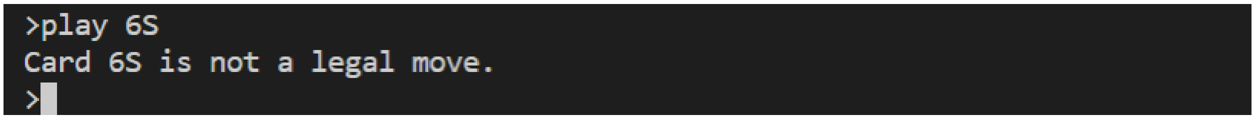
`play KH` <- a card that you do not own



```
>play KH
Card KH is not a legal move.
>
```

As you can see, there is a warning and the game is still waiting for your response. Let's try:

`play 6S` <- a card that you own, but it is not a legal move

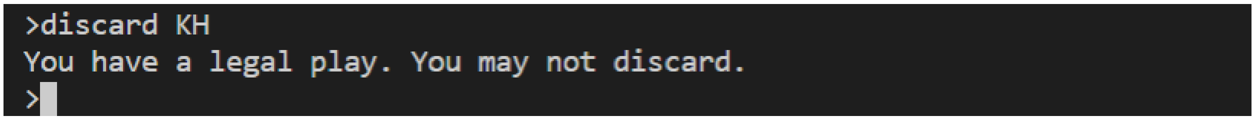


```
>play 6S
Card 6S is not a legal move.
>
```

Similarly, a warning message appeared and the game is still waiting for command.

Now, let's try discarding a card when there is a legal move:

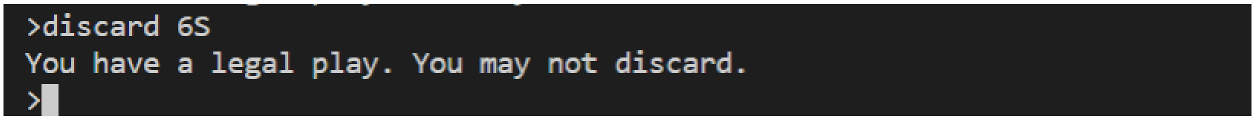
`discard KH` <- a card that you do not own



```
>discard KH
You have a legal play. You may not discard.
>
```

And same message happened when you discard a card that you own:

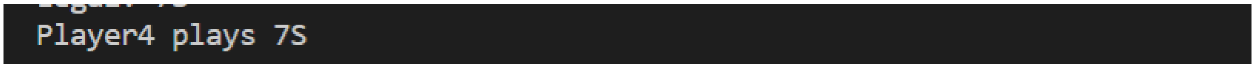
`discard 6S` <- a card that you own



```
>discard 6S
You have a legal play. You may not discard.
>
```

Finally, the game move on when we play a legal card when the legal list is not empty.

`play 7S` <- a legal card

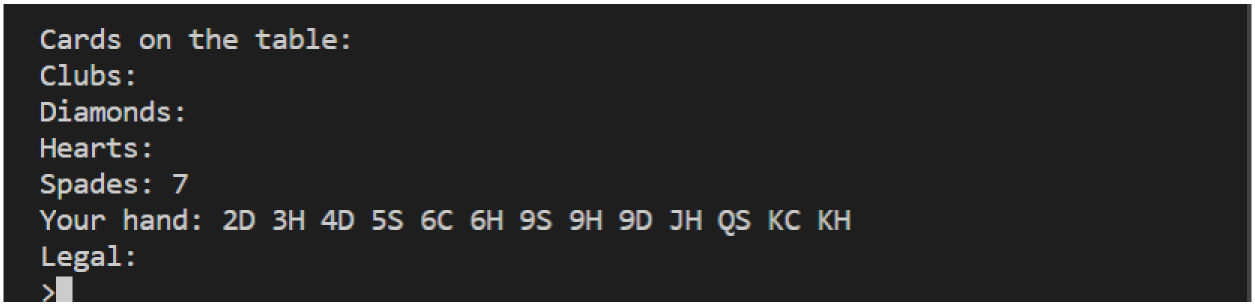


```
 Player4 plays 7S
```

The game shows that Player4 played 7S.

Step 7: The `discard` command and its exception handles

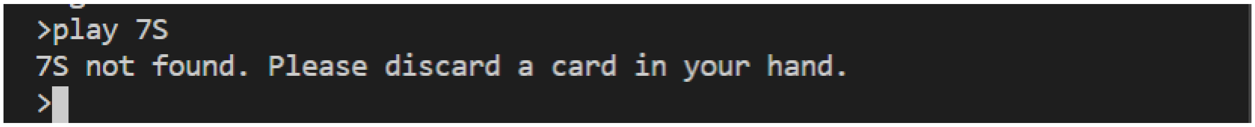
Now, the game move on the the next player, which is Player1. Notice that the card "7" of spade is added to the table.



```
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: 2D 3H 4D 5S 6C 6H 9S 9H 9D JH QS KC KH
Legal:
>
```

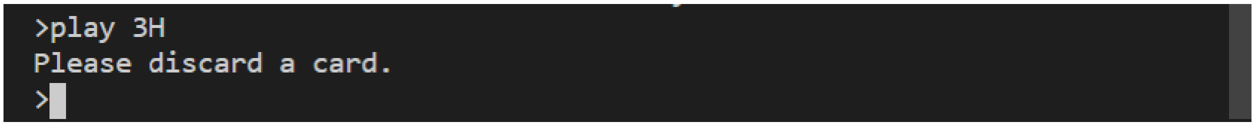
As we can see, the legal pile is empty. Let’s go through the exception handling by playing some cards.

`play 7S` <- a card that we do not own



```
>play 7S
7S not found. Please discard a card in your hand.
>
```

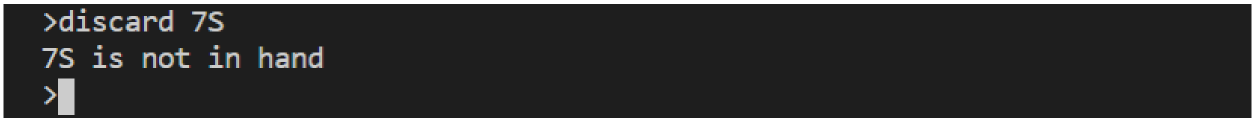
`play 3H` <- a card that we own



```
>play 3H
Please discard a card.
>
```

Or let’s discard a card that we do not own

`discard 7S` <- a card that we do not own

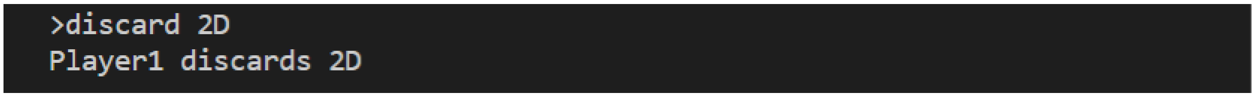


```
>discard 7S
7S is not in hand
>
```

In all of the able cases, there are some warning messages appeared and the game is still wait for a legal command.

When the legal pile is empty, we have to discard a card in hand. We type:

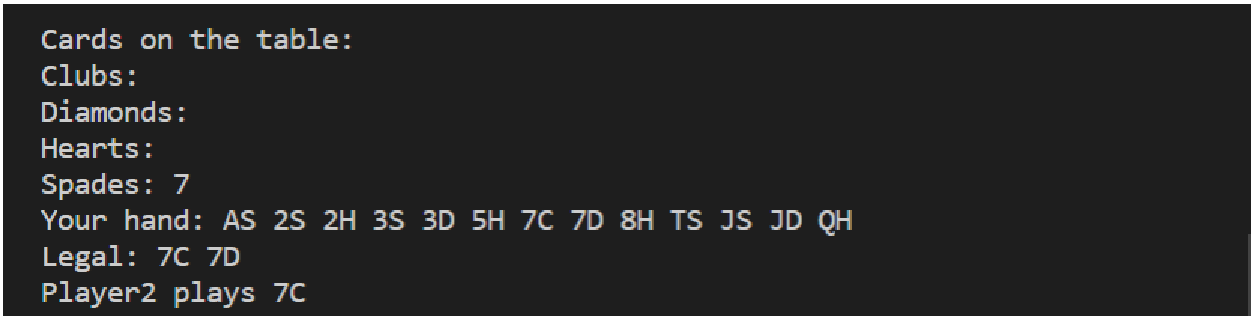
`discard 2D` <- a card that we own



```
>discard 2D
Player1 discards 2D
```

Step 8: The `play` behavior of computer

Now, the next player is Player2.



```
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: AS 2S 2H 3S 3D 5H 7C 7D 8H TS JS JD QH
Legal: 7C 7D
Player2 plays 7C
```

Since its has some “7” cards, which is the first card of the pile on table, it has some legal move. The computer player automatically choose the first card on the legal list to play.

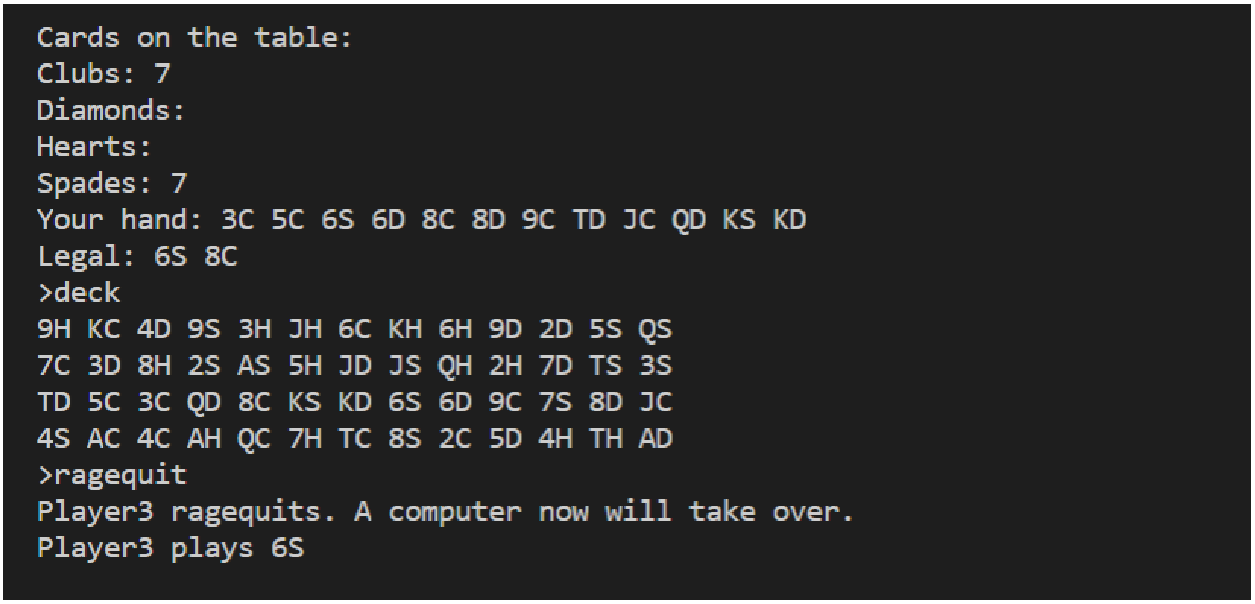
The game move on.

Step 8: The `ragequit` command

Now it is the turn of Player3, which is a human player. If the player is tired, he can assign a computer to play by typing:

`ragequit`

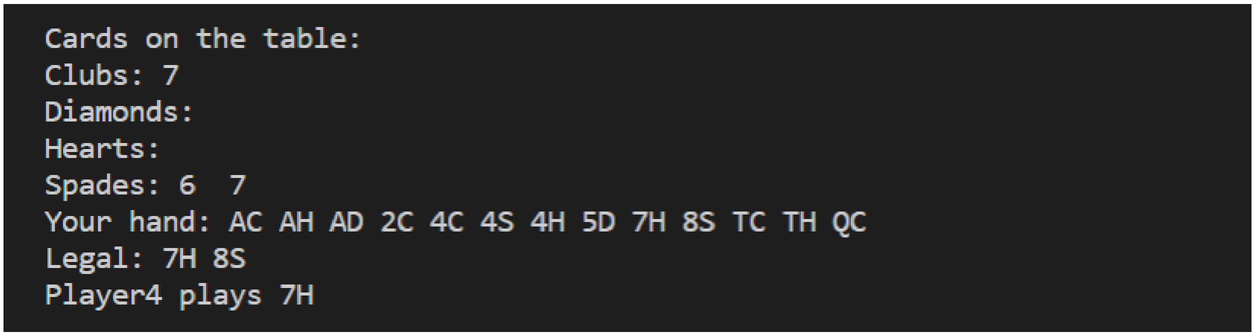
(sorry I tried the deck command in this too. Hope this does not confuse you)



```
Cards on the table:
Clubs: 7
Diamonds:
Hearts:
Spades: 7
Your hand: 3C 5C 6S 6D 8C 8D 9C TD JC QD KS KD
Legal: 6S 8C
>deck
9H KC 4D 9S 3H JH 6C KH 6H 9D 2D 5S QS
7C 3D 8H 2S AS 5H JD JS QH 2H 7D TS 3S
TD 5C 3C QD 8C KS KD 6S 6D 9C 7S 8D JC
4S AC 4C AH QC 7H TC 8S 2C 5D 4H TH AD
>ragequit
Player3 ragequits. A computer now will take over.
Player3 plays 6S
```

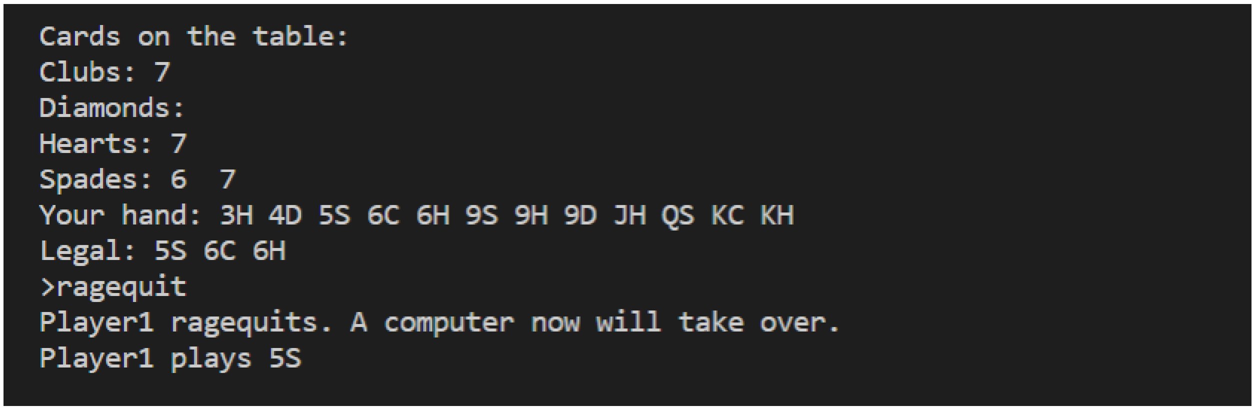
After ragequiting, the a computer player took over and play the first card in the legal pile, which is “6S”.

The game move on to the next which is Player 4, also a computer. It is also play the first card of its legal pile



```
Cards on the table:
Clubs: 7
Diamonds:
Hearts:
Spades: 6  7
Your hand: AC AH AD 2C 4C 4S 4H 5D 7H 8S TC TH QC
Legal: 7H 8S
Player4 plays 7H
```

The game move on. It is now Player1 turn. For the sake of length. I will also ragequit Player1, so computer plays until the end.

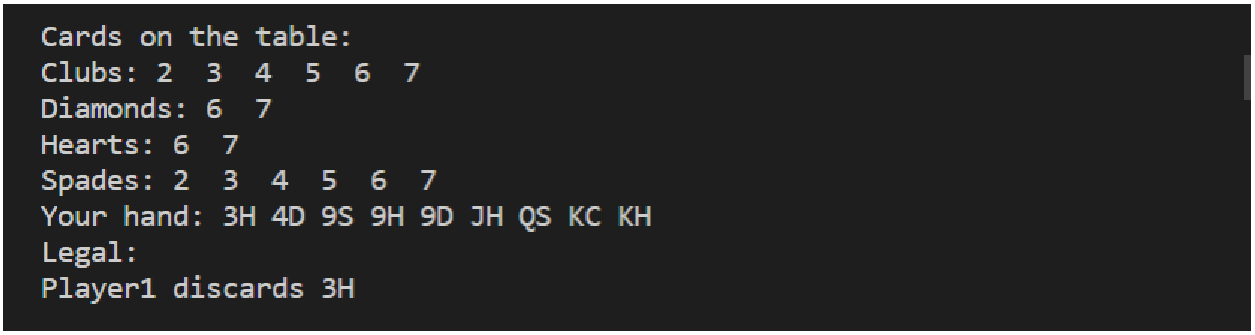


```
Cards on the table:
Clubs: 7
Diamonds:
Hearts: 7
Spades: 6  7
Your hand: 3H 4D 5S 6C 6H 9S 9H 9D JH QS KC KH
Legal: 5S 6C 6H
>ragequit
Player1 ragequits. A computer now will take over.
Player1 plays 5S
```

Below, I'll show you a few snippets of the game.

Part 9: The `discard` behavior of computer

At Player1's 5th turn, there are no legal cards although there are many cards in hand.

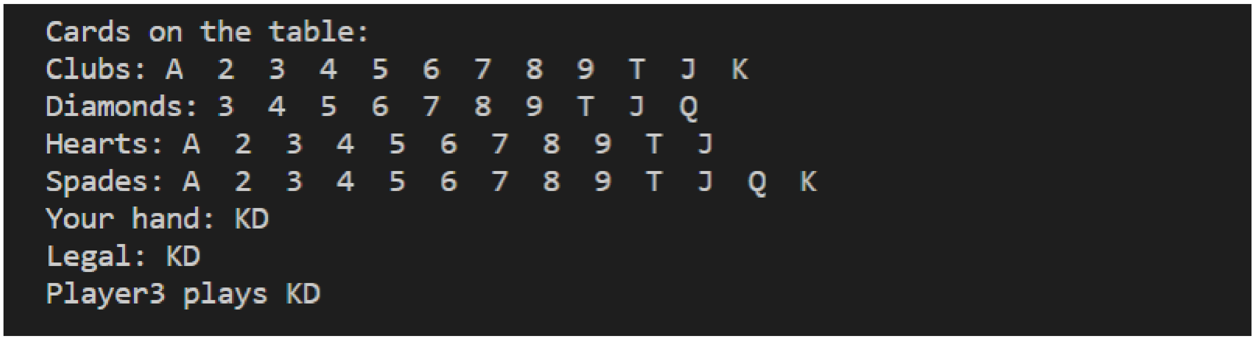


```
Cards on the table:
Clubs: 2  3  4  5  6  7
Diamonds: 6  7
Hearts: 6  7
Spades: 2  3  4  5  6  7
Your hand: 3H 4D 9S 9H 9D JH QS KC KH
Legal:
Player1 discards 3H
```

As we can see, the computer choses the first card in hand to discard.

Part 10: End of round. Start a new one.

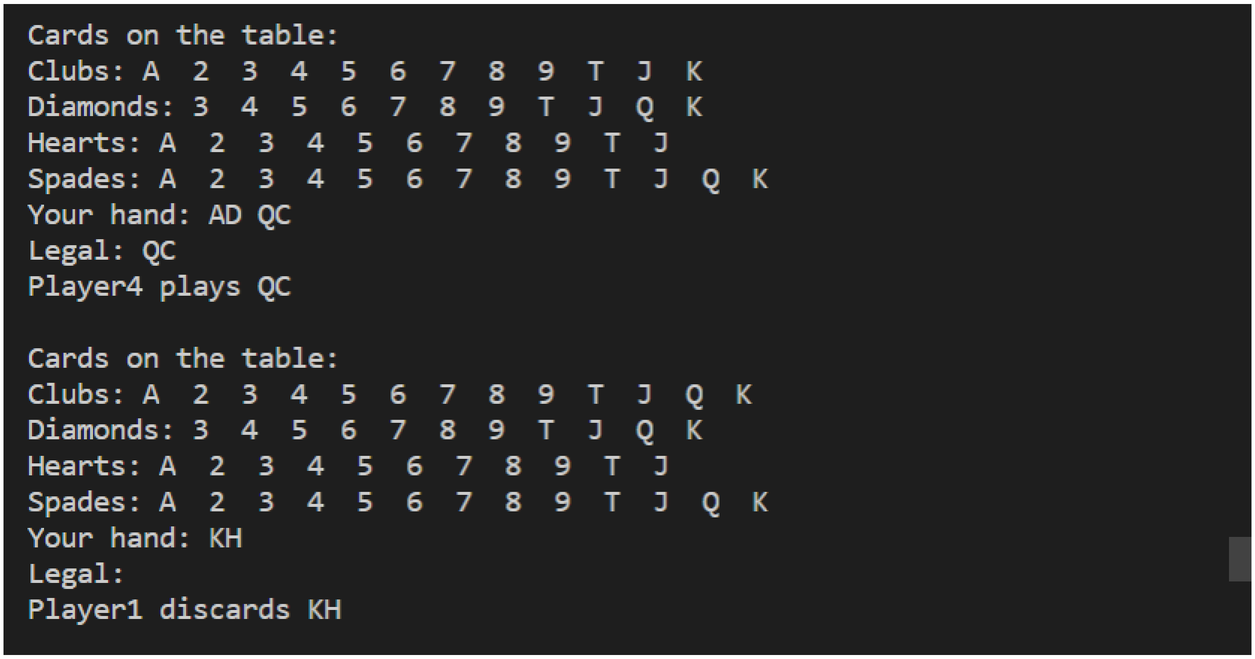
At some points near the end of the round:



```
Cards on the table:
Clubs: A  2  3  4  5  6  7  8  9  T  J  K
Diamonds: 3  4  5  6  7  8  9  T  J  Q
Hearts: A  2  3  4  5  6  7  8  9  T  J
Spades: A  2  3  4  5  6  7  8  9  T  J  Q  K
Your hand: KD
Legal: KD
Player3 plays KD
```

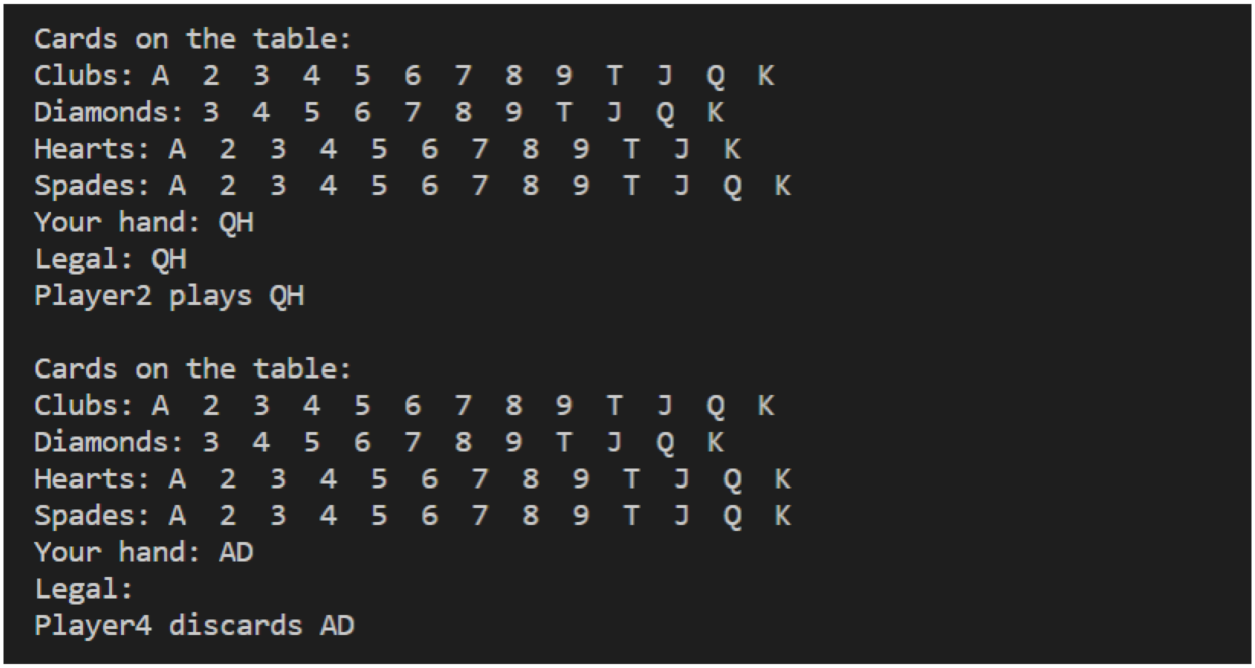
We can see that this is Player3’s last card. After playing KD, it is out of card.

The game continues as below:



```
Cards on the table:
Clubs: A  2  3  4  5  6  7  8  9  T  J  K
Diamonds: 3  4  5  6  7  8  9  T  J  Q  K
Hearts: A  2  3  4  5  6  7  8  9  T  J
Spades: A  2  3  4  5  6  7  8  9  T  J  Q  K
Your hand: AD QC
Legal: QC
Player4 plays QC

Cards on the table:
Clubs: A  2  3  4  5  6  7  8  9  T  J  Q  K
Diamonds: 3  4  5  6  7  8  9  T  J  Q  K
Hearts: A  2  3  4  5  6  7  8  9  T  J
Spades: A  2  3  4  5  6  7  8  9  T  J  Q  K
Your hand: KH
Legal:
Player1 discards KH
```

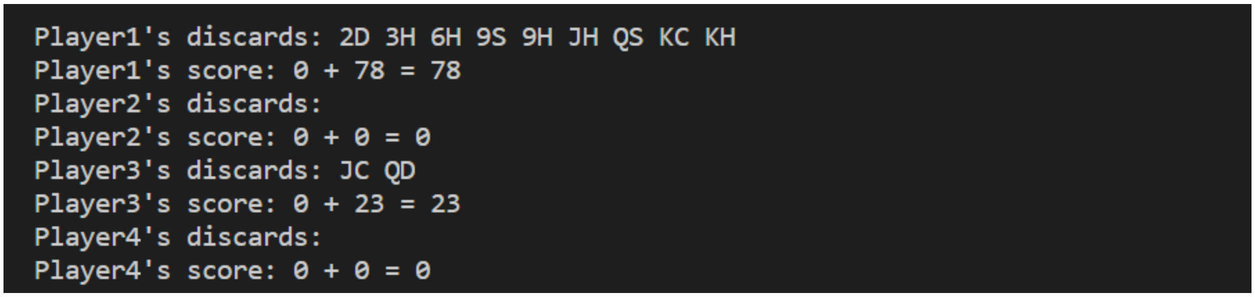


```
Cards on the table:
Clubs: A  2  3  4  5  6  7  8  9  T  J  Q  K
Diamonds: 3  4  5  6  7  8  9  T  J  Q  K
Hearts: A  2  3  4  5  6  7  8  9  T  J  K
Spades: A  2  3  4  5  6  7  8  9  T  J  Q  K
Your hand: QH
Legal: QH
Player2 plays QH

Cards on the table:
Clubs: A  2  3  4  5  6  7  8  9  T  J  Q  K
Diamonds: 3  4  5  6  7  8  9  T  J  Q  K
Hearts: A  2  3  4  5  6  7  8  9  T  J  Q  K
Spades: A  2  3  4  5  6  7  8  9  T  J  Q  K
Your hand: AD
Legal:
Player4 discards AD
```

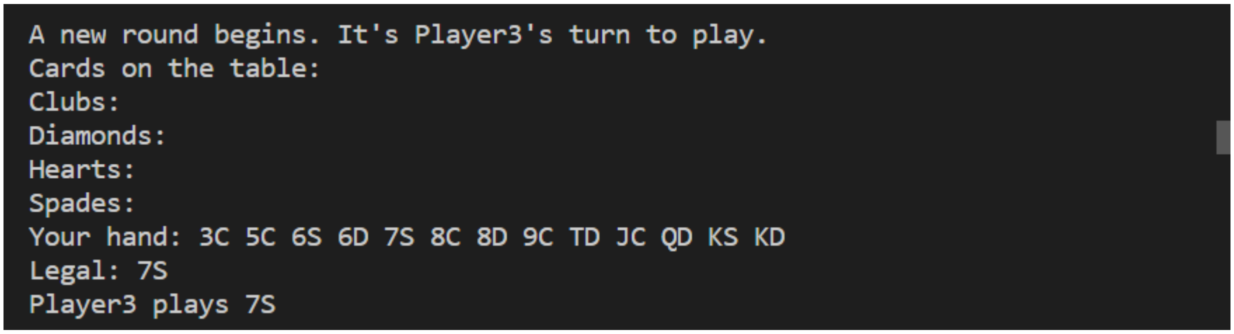
We can see that after Player2's turn, it skipped Player3 because he is out of card, jump straight to Player4.

After Player4's turn, everyone's hands are empty. The round now end, and the points of each player is calculated.



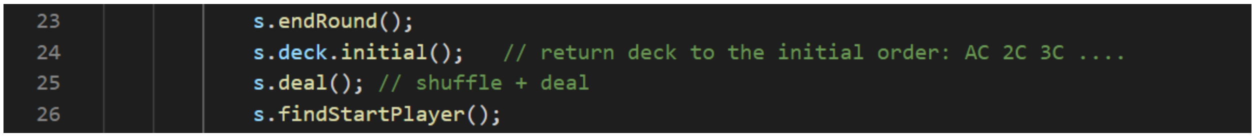
```
Player1's discards: 2D 3H 6H 9S 9H JH QS KC KH
Player1's score: 0 + 78 = 78
Player2's discards:
Player2's score: 0 + 0 = 0
Player3's discards: JC QD
Player3's score: 0 + 23 = 23
Player4's discards:
Player4's score: 0 + 0 = 0
```

As we can see, Player1 does not have a good round. However, no one reaches 80 points, so another round begins.



```
A new round begins. It's Player3's turn to play.
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades:
Your hand: 3C 5C 6S 6D 7S 8C 8D 9C TD JC QD KS KD
Legal: 7S
Player3 plays 7S
```

The game automatically turn the deck into initial order, then shuffle it randomly again. This is a snippet of the code in main.cc:

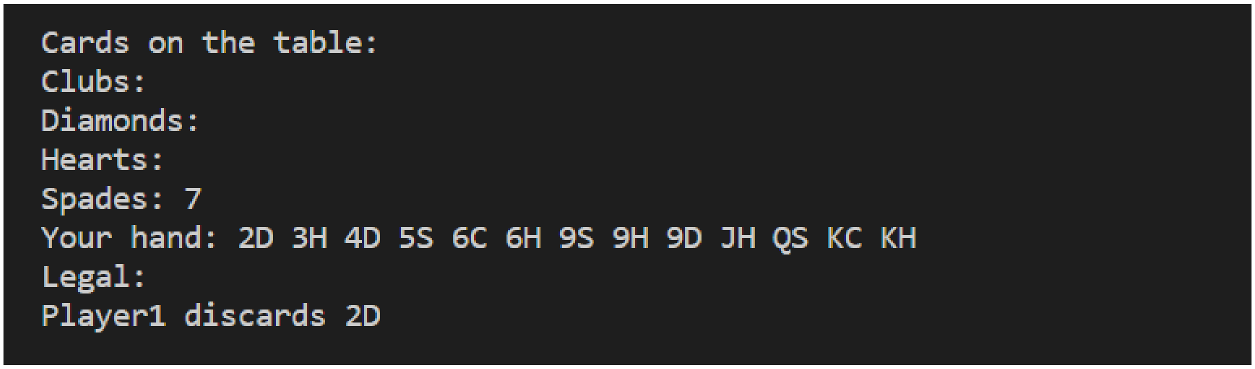


```
            s.endRound();
            s.deck.initial();   // return deck to the initial order: AC 2C 3C ....
            s.deal(); // shuffle + deal
            s.findStartPlayer();
```

As usual, the computer find the fist card in hand to play. The game move on.

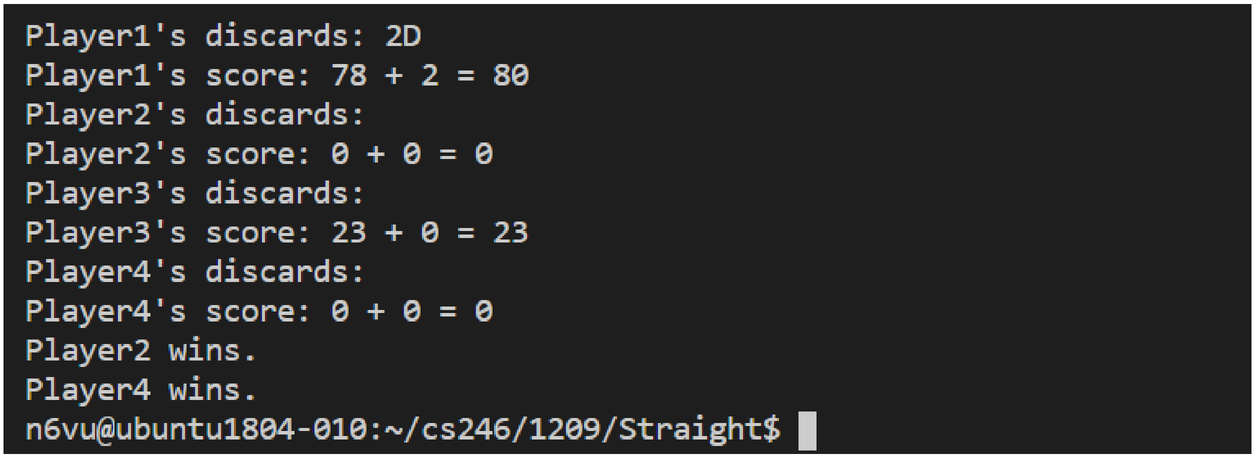
<u>Part 11: End of game</u>

As we know, Player1 has 78 points after round1, and it is very close to the 80 points limit. In fact, he reaches exact 80 when discarding 2D in second round.



```
Cards on the table:
Clubs:
Diamonds:
Hearts:
Spades: 7
Your hand: 2D 3H 4D 5S 6C 6H 9S 9H 9D JH QS KC KH
Legal:
Player1 discards 2D
```

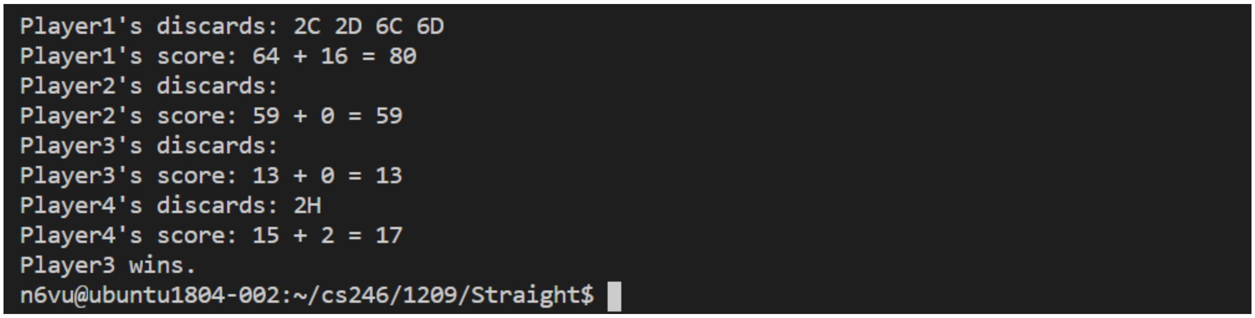
However, this round started with player 4, so the whole table must run for a full turn until it reaches player 4 again, so everyone has the same number of card played for fairness when calculating points. After eveyone’s turn, the game is ended, and the score table appeared.



```
Player1's discards: 2D
Player1's score: 78 + 2 = 80
Player2's discards:
Player2's score: 0 + 0 = 0
Player3's discards:
Player3's score: 23 + 0 = 23
Player4's discards:
Player4's score: 0 + 0 = 0
Player2 wins.
Player4 wins.
n6vu@ubuntu1804-010:~/cs246/1209/Straight$
```

In this case, we see both Player2 and Player4 has the same points is 0 and is the lowest point out of 4, so both of then wins.

In another case when there is only one player has the minimum point out of three, only one winner is announced.

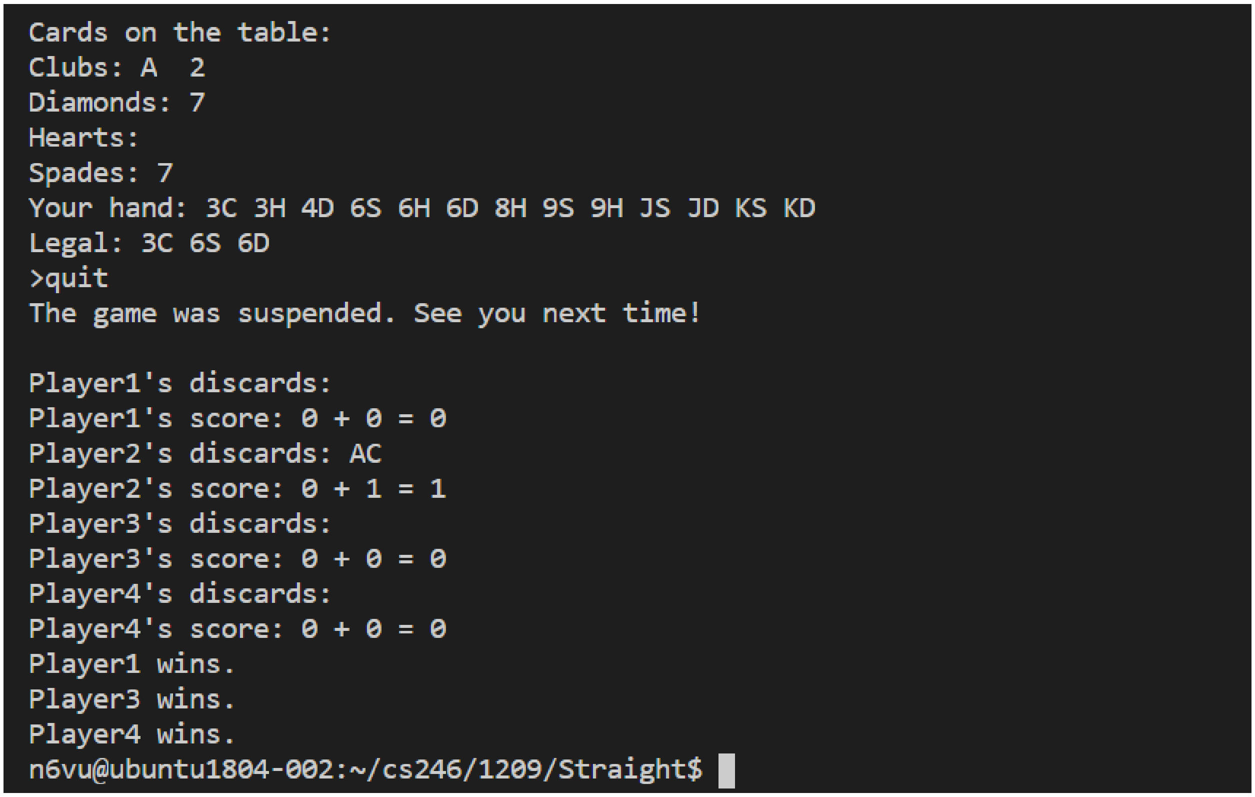


```
Player1's discards: 2C 2D 6C 6D
Player1's score: 64 + 16 = 80
Player2's discards:
Player2's score: 59 + 0 = 59
Player3's discards:
Player3's score: 13 + 0 = 13
Player4's discards: 2H
Player4's score: 15 + 2 = 17
Player3 wins.
n6vu@ubuntu1804-002:~/cs246/1209/Straight$
```

Part 12: The `quit` command

At any point of a human turn, you can use the quit command to quit immediately

`quit`



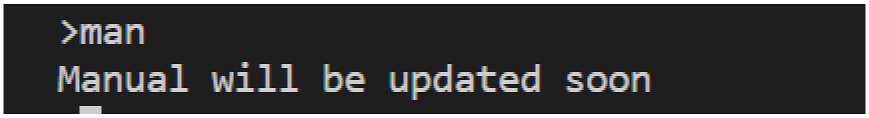
```
Cards on the table:
Clubs: A  2
Diamonds: 7
Hearts:
Spades: 7
Your hand: 3C 3H 4D 6S 6H 6D 8H 9S 9H JS JD KS KD
Legal: 3C 6S 6D
>quit
The game was suspended. See you next time!

Player1's discards:
Player1's score: 0 + 0 = 0
Player2's discards: AC
Player2's score: 0 + 1 = 1
Player3's discards:
Player3's score: 0 + 0 = 0
Player4's discards:
Player4's score: 0 + 0 = 0
Player1 wins.
Player3 wins.
Player4 wins.
n6vu@ubuntu1804-002:~/cs246/1209/Straight$
```

A goodbye message is appeared, also the point of all player so far also appeard to show their progress.

Part 13: The `man` command

This is actually an undone part. When “man” is typed, this message appeared.



```
 >man
Manual will be updated soon
```

That is it for my demo. Thank you so much for a great semester.