POKER - Protocol Specification

In `example_player.cpp` and `example_player.py`, we already provides a C++ implementation and a Python3 implementation to deal with all the communication. If you decide to build your agent with C++ or Python3, you can use those implementations directly. However, if you build your agent with other languages, you may need to implement your own part for communication.

This document describes the format of messages between the ACPC dealer program (server) and a player (client.) Communication is over TCP, with clients connecting to the server (the client will be given a numeric address) using the ports printed out by the server.

- All messages are terminated by a carriage return and a new line ('\r\n' or ASCII characters 13 and 10, respectively.)
- Any message from the server which starts with '#' or ';' is a comment or GUI command, and may be safely ignored.
- After socket connection established, the first message from a player must be a version string:

  ```
  VERSION:2.0.0\r\n
  ```

- After this, the server will repeatedly send messages to the client giving their view of the match state, including states where the client is not acting, and the final state when the game is over. The match state string is defined as:

  ```
  MATCHSTATE:<position>:<handNumber>:<betting>:<cards>\r\n
  ```

  - `<position>`: an integer telling the client their position relative to the dealer button. 0 for the big blind player, 1 for the small blind player.
  - `<handNumber>`: an integer identifying the current hand. Clients should make no assumption about these values, other than that it will be unique across hands within a match, and that it will not change within a single hand.
  - `<betting>`: a string of "actions" separated by "/" for each round
    - 3 kinds of actions: `f` - fold, `c` - call, `r1500` - raise betting to 1500 (can be substituted with any legal raise amount)
    - e.g. Assume that player 1 is the small blind player, player 2 is the big blind player.

      ```
      cr200c/cc/cc/r7748f
      ```

      - player 1 calls
      - player 2 raises to 200
      - player 1 calls, round 1 ends, 3 public cards are dealt
      - player 2 calls,

        - player 1 calls, round 2 ends, 1 more public card is dealt
        - player 2 calls,
        - player 1 calls, round 2 ends, 1 more public card is dealt
        - player 2 raises to 7748,
        - player 1 folds, game ends.
    - `cards`: a string indicating player's private cards and public cards, separated by "/" for each round
        - e.g.

          ```
          5d5c|/8dAs8s/4h
          ```

            - `5d5c|`: 5d5c are dealt to player at `position` 0 as private cards, which is the big blind player.
            - `8dAs8s`: 8dAs8s are dealt as 3 public cards in round 2.
            - `4h`: 4h is dealt as 1 public card in round 3.

          ```
          |9hQd/8dAs8s/4h
          ```

            - `|9hQd`: 9hQd are dealt to player at `position` 1 as private cards, which is the big blind player.
            - `8dAs8s`: 8dAs8s are dealt as 3 public cards in round 2.
            - `4h`: 4h is dealt as 1 public card in round 3.
        - NOTE:
- If the client is acting, it will respond by returning a message with the same state, followed by an action.
    - e.g. After observing

      ```
      MATCHSTATE:1:0:cr200c/cc/cc/r7748:|9hQd/8dAs8s/4h
      ```

      the player at `position` 1 returns

      ```
      MATCHSTATE:1:0:cr200c/cc/cc/r7748:|9hQd/8dAs8s/4h:r19211
      ```

      to indicate that he decides to raise to 19211.
- If the client is not acting, it does not respond anything. If it does respond, the server discards this message and prints a warning to stderr.
- If the client responds with an invali action, the server assumes that the client decides to "call" (since "call" is a valid action at all times), and prints a warning to stderr.

This is an example of one hand. "TO" means the message was sent from server to clients. "FROM" means the message was sent from one client to the server.

You can generate your own examples by running

```
$ ./play_match.pl matchName holdem.nolimit.2p.reverse_blinds.game 1000 0 Alice
./example_player Bob ./example_player
```

Then, this kind of game logs can be found in `logs/matchName.err`.

```
TO 1 at 1582788688.235716 MATCHSTATE:0:0::5d5c|
TO 2 at 1582788688.235741 MATCHSTATE:1:0::|9hQd
FROM 2 at 1582788688.235827 MATCHSTATE:1:0::|9hQd:c
TO 1 at 1582788688.235883 MATCHSTATE:0:0:c:5d5c|
TO 2 at 1582788688.235899 MATCHSTATE:1:0:c:|9hQd
FROM 1 at 1582788688.235949 MATCHSTATE:0:0:c:5d5c|:c
TO 1 at 1582788688.235974 MATCHSTATE:0:0:cc/:5d5c|/8dAs8s
TO 2 at 1582788688.236000 MATCHSTATE:1:0:cc/:|9hQd/8dAs8s
FROM 1 at 1582788688.236019 MATCHSTATE:0:0:cc/:5d5c|/8dAs8s:c
TO 1 at 1582788688.236034 MATCHSTATE:0:0:cc/c:5d5c|/8dAs8s
TO 2 at 1582788688.236053 MATCHSTATE:1:0:cc/c:|9hQd/8dAs8s
FROM 2 at 1582788688.236092 MATCHSTATE:1:0:cc/c:|9hQd/8dAs8s:c
TO 1 at 1582788688.236140 MATCHSTATE:0:0:cc/cc/:5d5c|/8dAs8s/4h
TO 2 at 1582788688.236167 MATCHSTATE:1:0:cc/cc/:|9hQd/8dAs8s/4h
FROM 1 at 1582788688.236195 MATCHSTATE:0:0:cc/cc/:5d5c|/8dAs8s/4h:c
TO 1 at 1582788688.236223 MATCHSTATE:0:0:cc/cc/c:5d5c|/8dAs8s/4h
TO 2 at 1582788688.236240 MATCHSTATE:1:0:cc/cc/c:|9hQd/8dAs8s/4h
FROM 2 at 1582788688.236278 MATCHSTATE:1:0:cc/cc/c:|9hQd/8dAs8s/4h:c
TO 1 at 1582788688.236301 MATCHSTATE:0:0:cc/cc/cc/:5d5c|/8dAs8s/4h/6d
TO 2 at 1582788688.236317 MATCHSTATE:1:0:cc/cc/cc/:|9hQd/8dAs8s/4h/6d
FROM 1 at 1582788688.236350 MATCHSTATE:0:0:cc/cc/cc/:5d5c|/8dAs8s/4h/6d:r7748
TO 1 at 1582788688.236372 MATCHSTATE:0:0:cc/cc/cc/r7748:5d5c|/8dAs8s/4h/6d
TO 2 at 1582788688.236383 MATCHSTATE:1:0:cc/cc/cc/r7748:|9hQd/8dAs8s/4h/6d
FROM 2 at 1582788688.236429 MATCHSTATE:1:0:cc/cc/cc/r7748:|9hQd/8dAs8s/4h/6d:r19211
TO 1 at 1582788688.236448 MATCHSTATE:0:0:cc/cc/cc/r7748r19211:5d5c|/8dAs8s/4h/6d
TO 2 at 1582788688.236459 MATCHSTATE:1:0:cc/cc/cc/r7748r19211:|9hQd/8dAs8s/4h/6d
FROM 1 at 1582788688.236486 MATCHSTATE:0:0:cc/cc/cc/r7748r19211:5d5c|/8dAs8s/4h/6d:c
TO 1 at 1582788688.237600 MATCHSTATE:0:0:cc/cc/cc/r7748r19211c:5d5c|9hQd/8dAs8s/4h/6d
TO 2 at 1582788688.237619 MATCHSTATE:1:0:cc/cc/cc/r7748r19211c:5d5c|9hQd/8dAs8s/4h/6d
```