Instructions for launching and playing Connect Four

Notes/Constraints:
- This is a console version for the game and needs to be compiled and ran in the command line.
- The game has only been tested to run on a single machine, despite having client-server functionality.
- The game has not been tested in depth for un-breakability, therefore it may still have some bugs. For example, there is a bug where spamming input moves can cause the game to end prematurely in a tie.

Launch Instructions

1. Open two command line windows, one that will run server-mode, one that will run client-mode.

2. Compile the .c file (creating output file *a*) with the following line:

   gcc connectfour.c -o a

3. Run the output file. Make sure to include the following arguments depending on whether the window is running server-mode or client-mode.

   Server-mode: ./a [port]

   Client-mode: ./a [IP address] [port]

   Port can be chosen as any free port on the machine.
   IP address can be entered as *0.0.0.0* or *127.0.0.1* for localhost.

   Running Example:

   Server-mode: ./a 10000
   Client-mode: ./a 0.0.0.0 10000   or
                   ./a 127.0.0.1 10000

   Invalid entry of arguments when running the output file will give the following error:

   Error: Invalid command-line arguments

   Command-line arguments must either be 1 for Server-mode or 2 for Client-mode.

Example:

Server-mode: ./[output file] [port]

Client-mode: ./[output file] [IP address] [port]

4. Running the game successfully should show the following:

Server-mode	Client-mode
You are running as: Server-mode Client has connected to the game. Welcome to Connect Four. --------------- Setting up the game --------------- Player 1, enter your name... ▊	You are running as: Client-mode Connection to server established. Welcome to Connect Four. --------------- Setting up the game --------------- Player 2, enter your name... ▊

Game Instructions

1. Enter your names

Player 1, enter your name...	Player 2, enter your name...
Simon▯	William▊

2. The board will be created and player 1 given the first turn. The columns are named horizontally from A to G. Enter a letter A-G to drop a disc into the corresponding column. Players can choose Q during their turn to quit the game.

Letters must be entered as a capital letter, otherwise the input will be invalid and the player asked to input their choice again.

Player 1's moves will use an 'R' for red and player 2's moves will use a 'B' for black.

```
Simon: Your color is red - R                          William: Your color is black - B

  A   B   C   D   E   F   G                              A   B   C   D   E   F   G
--------------------------------                       --------------------------------
[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]

[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]

[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]

[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]

[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]

[_] [_] [_] [_] [_] [_] [_]                            [_] [_] [_] [_] [_] [_] [_]
--------------------------------

Turn: Simon

Enter a letter A-G, for the column to drop a disc into...   Simon's turn - waiting for their move...
Or press 'Q' to quit the game.
```

Invalid input moves will yield the following message and the current turn's player will be asked input their choice again.

```
Turn: Simon

Enter a letter A-G, for the column to drop a disc into...
Or press 'Q' to quit the game.

d

Invalid move.
Letter entered must either be A-G or Q.

Enter a letter, or press Q to quit.
```

3. Trying to drop a disc into a column when it is full will give the following invalid message and ask the player to pick a different column:

```
  A   B   C   D   E   F   G                              A   B   C   D   E   F   G
--------------------------------                       --------------------------------
[_] [_] [_] [B] [_] [_] [_]                            [_] [_] [_] [B] [_] [_] [_]

[_] [_] [_] [R] [_] [_] [_]                            [_] [_] [_] [R] [_] [_] [_]

[_] [_] [_] [B] [_] [_] [_]                            [_] [_] [_] [B] [_] [_] [_]

[_] [_] [_] [R] [_] [_] [_]                            [_] [_] [_] [R] [_] [_] [_]

[_] [_] [_] [B] [_] [_] [_]                            [_] [_] [_] [B] [_] [_] [_]

[_] [_] [_] [R] [_] [_] [_]                            [_] [_] [_] [R] [_] [_] [_]

Invalid choice: Column 4 is full
Choose a different column

Turn still: Simon                                      Invalid choice: Column 4 is full
                                                       Choose a different column
Enter a letter A-G, for the column to drop a disc into...
Or press 'Q' to quit the game.                         Turn still: Simon - waiting for their move...
```

4. The game will continue until either:
   ○ a player connects four discs in a row ⟶ there is a winner

- the game board becomes full → it is a tie
- a player quits → there is a winner

The game will be ended and the winner and loser will be announced.

```
A    B    C    D    E    F    G              A    B    C    D    E    F    G
-------------------------------             -------------------------------
[_]  [_]  [_]  [B]  [_]  [_]  [_]           [R]  [B]  [R]  [B]  [R]  [B]  [B]

[_]  [_]  [_]  [R]  [_]  [_]  [_]           [R]  [B]  [R]  [B]  [R]  [B]  [R]

[_]  [_]  [_]  [B]  [_]  [_]  [_]           [B]  [R]  [B]  [R]  [B]  [R]  [B]

[_]  [_]  [_]  [R]  [_]  [_]  [_]           [B]  [R]  [B]  [R]  [B]  [R]  [B]

[B]  [_]  [_]  [B]  [_]  [_]  [_]           [R]  [B]  [R]  [B]  [R]  [B]  [R]

[B]  [_]  [_]  [R]  [R]  [R]  [R]           [R]  [B]  [R]  [B]  [R]  [B]  [R]
---------- Game Over: The game has been won ----------    ---------- Game Over: The board is full -----------
Winner: Simon                                                        The game is a tie
Loser: William
                                            Good job players:
Good job players:                                     Simon
        Simon                                         William
        William
                                            --------------- Destroying the game ---------------
--------------- Destroying the game ---------------
```

```
A    B    C    D    E    F    G
-------------------------------
[_]  [_]  [_]  [_]  [_]  [_]  [_]

[_]  [_]  [_]  [_]  [_]  [_]  [_]

[_]  [_]  [_]  [_]  [_]  [_]  [_]

[_]  [_]  [_]  [B]  [_]  [_]  [_]

[_]  [_]  [_]  [B]  [_]  [_]  [_]

[_]  [_]  [R]  [R]  [R]  [_]  [_]
---------- Game Over: The game has been quit ----------
William has quit the game

Winner: Simon
Loser: William

Good job players:
        Simon
        William

--------------- Destroying the game ---------------
```

5. To play again, run the output file again along with the server-mode and client-mode arguments.

Have fun! :-)