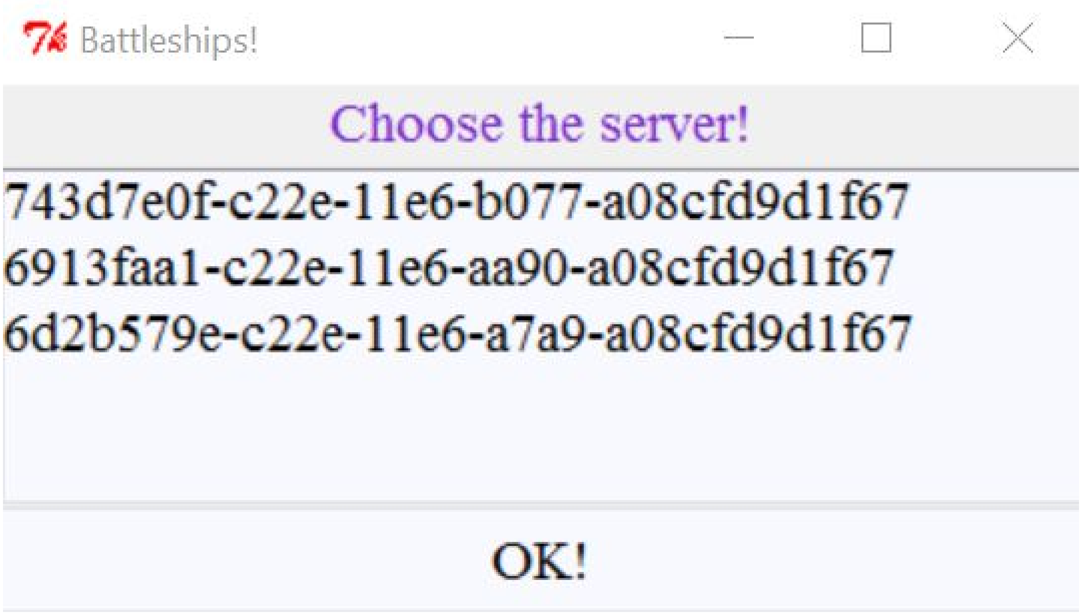
Distributed systems
Homework 2: Multiplayer battleship game
Manual

In git repo you can find files:
server.py
battle_board.py
battle_client.py
battle_login.py
battle_parser.py

1. Download them.
2. Install pyCharm
3. Run the files in PyCharm as a PyCharm project
4. Install pika 0.10.0
5. Install RabbitMQ
6. Run server.py.
7. For each instance of client run battle_login.py.

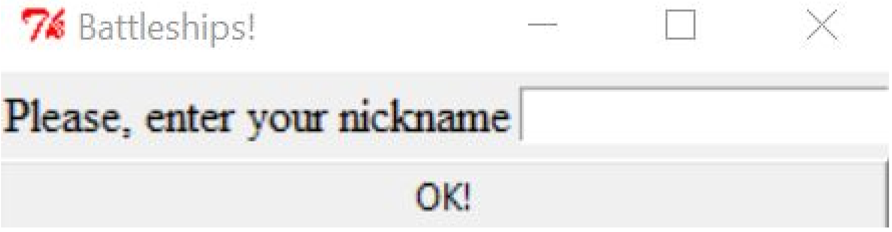
Game preparation

After you run the client you will see the next window:



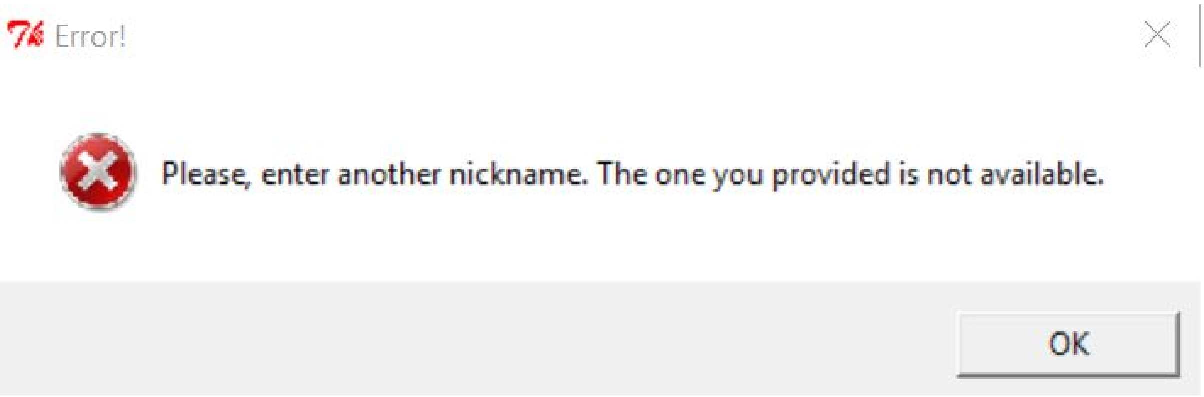
```
743d7e0f-c22e-11e6-b077-a08cfd9d1f67
6913faa1-c22e-11e6-aa90-a08cfd9d1f67
6d2b579e-c22e-11e6-a7a9-a08cfd9d1f67
```

In this window you can find all available servers.(Servers are now running on localhost) Choose one of them and push the “OK!” button. You will see the next window:



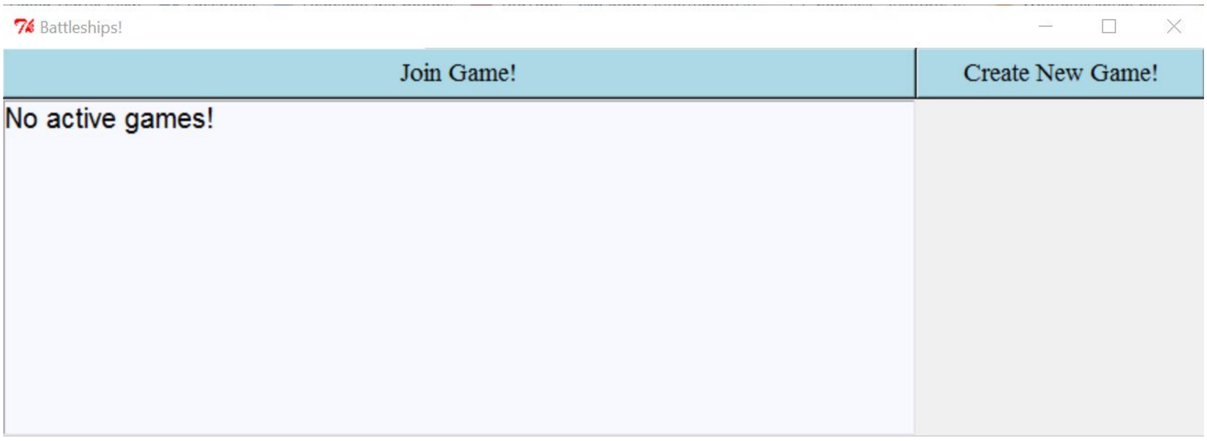
Here you need to fill your nickname.

If you fill the name that is already used on the server you will see the next window:



Please, enter another nickname. The one you provided is not available.

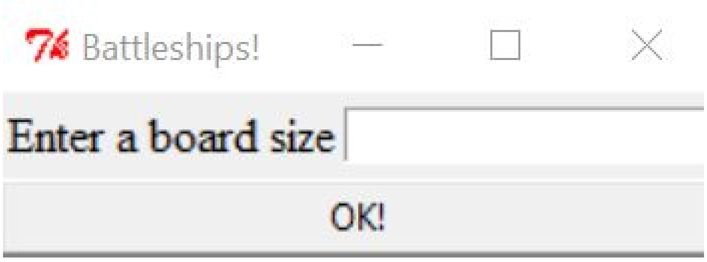
After inserting your nickname push the “OK!” button. You will see the next window:



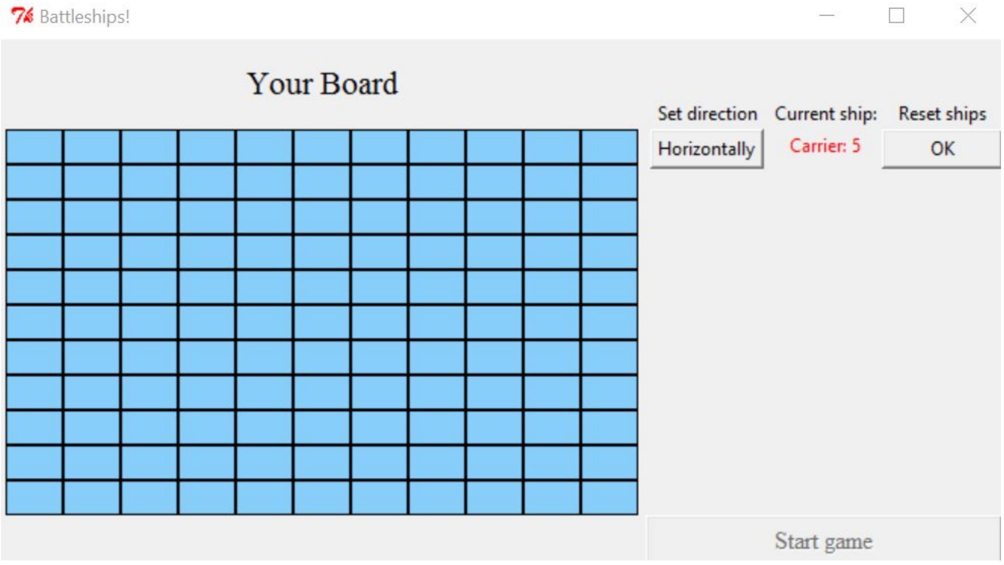
No active games!

Here you can choose one of active games in the server or create the new one. If there is no active games on the server you will see the message: “No active games!”.

1. If you want to create new game push the “Create New Game!” button. You will see the next window:

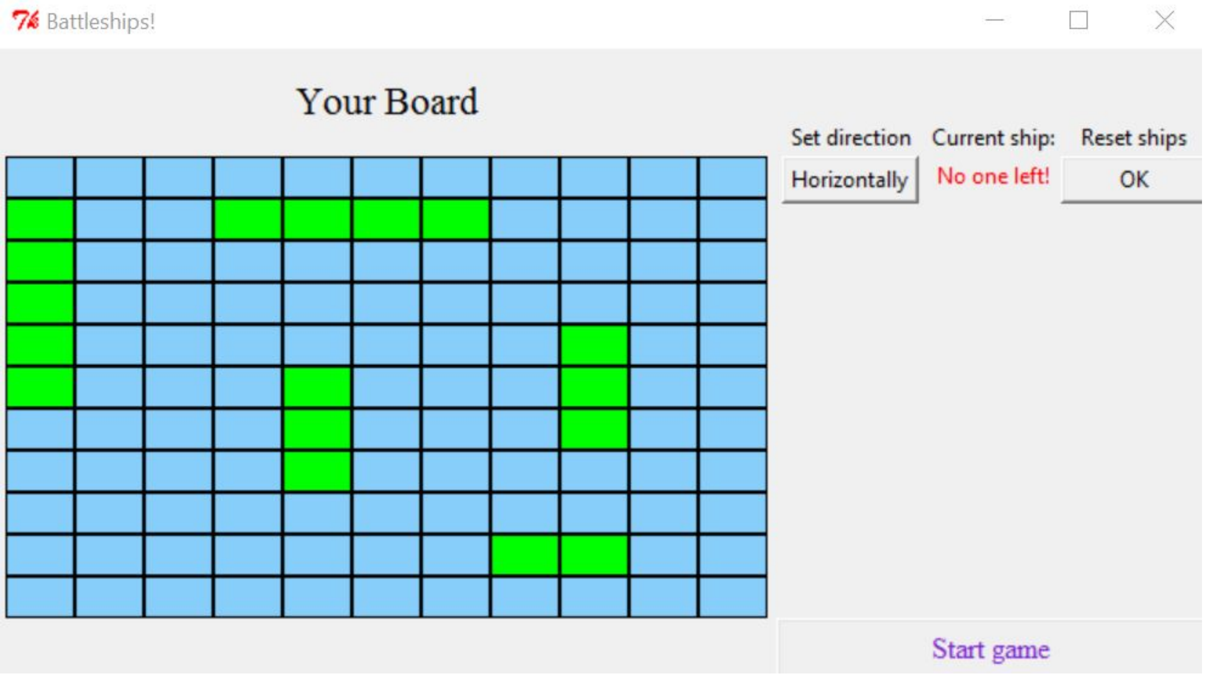


Here you need to fill the size of a field you want to play. If the size of a field less than 10 or greater than 40 you shall not pass further. After inserting you will see the next window:



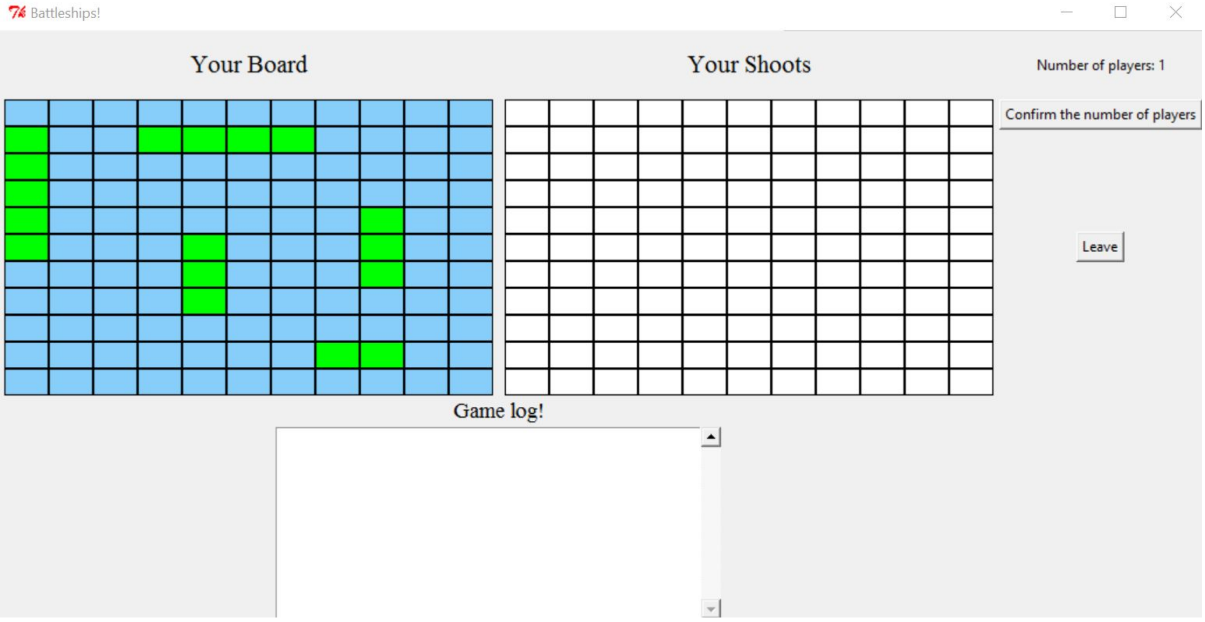
Here you need to place your ships. You have one ship of length 5, one ship of length 4, two ships of length 3 and one ship of length 2. By the default you place the ships from larger to smaller. If you want to place the ship horizontally press the button “Horizontally” (default option) and if you want to place the ship vertically press the button “Vertically”. If you want to reset ships push the button “Reset ships!”. Until you don’t place all ships the button “Start game” is inactive.

After placing ships you will see the next window:



And the button “Start game” is active.

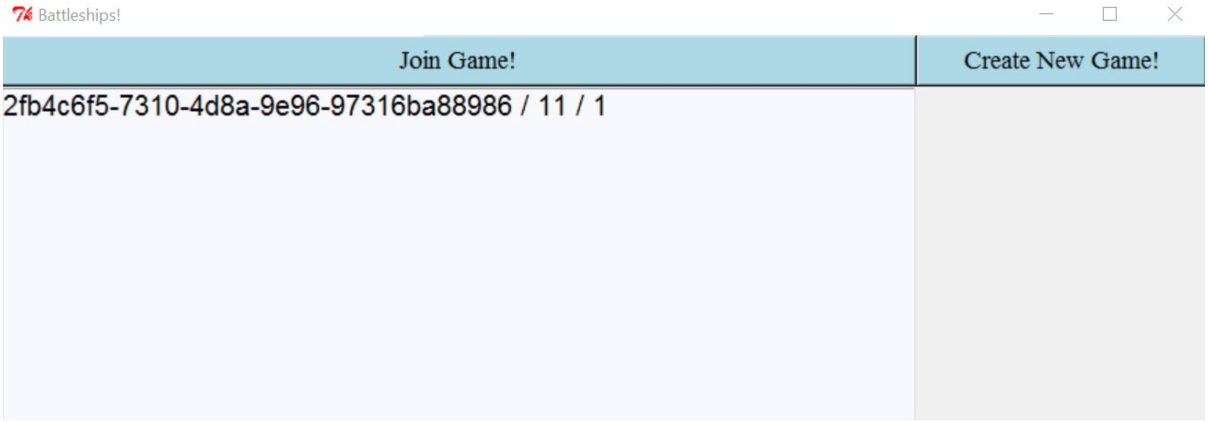
After you push the button “Start game” you will see the next window:



Here you can see your board, the your shoot board and game log. In right top corner you can see the number of players which are connected and placed their ships. Also you can see the “Leave” button. “leave” button allow you to leave from the current game.

If you satisfied with the number of players push the button “Confirm the number of players”. After you push this button the game is started.

2. If you want to join existing game you must see the next picture:



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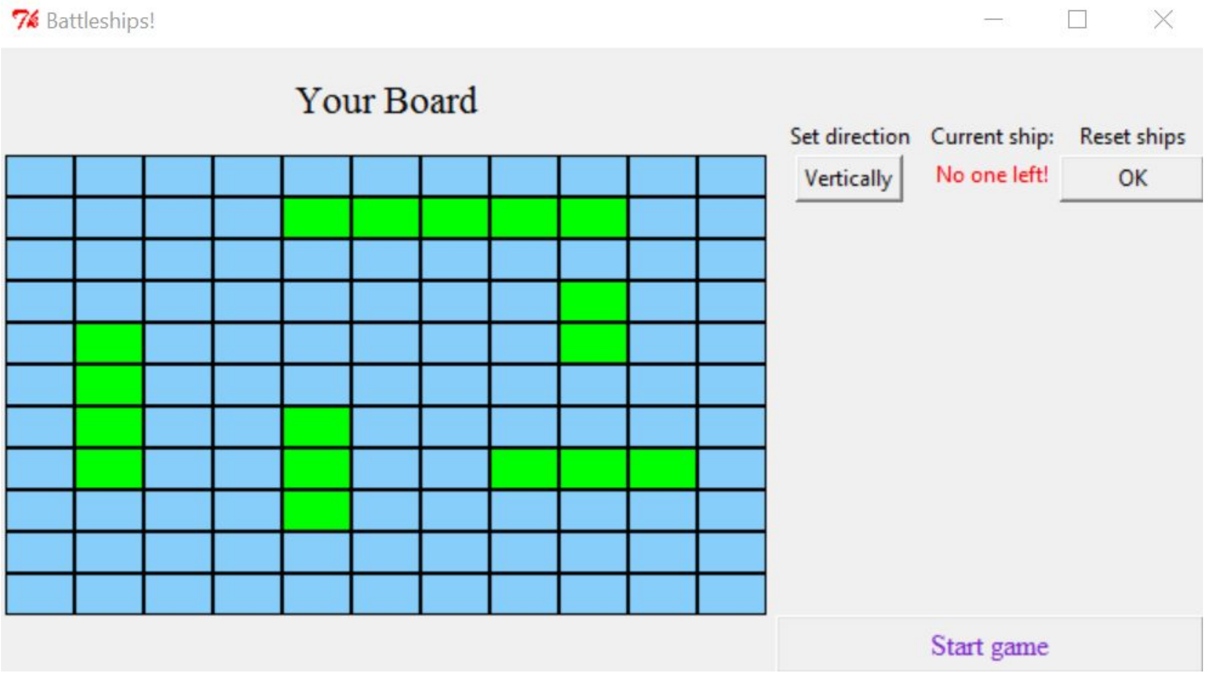
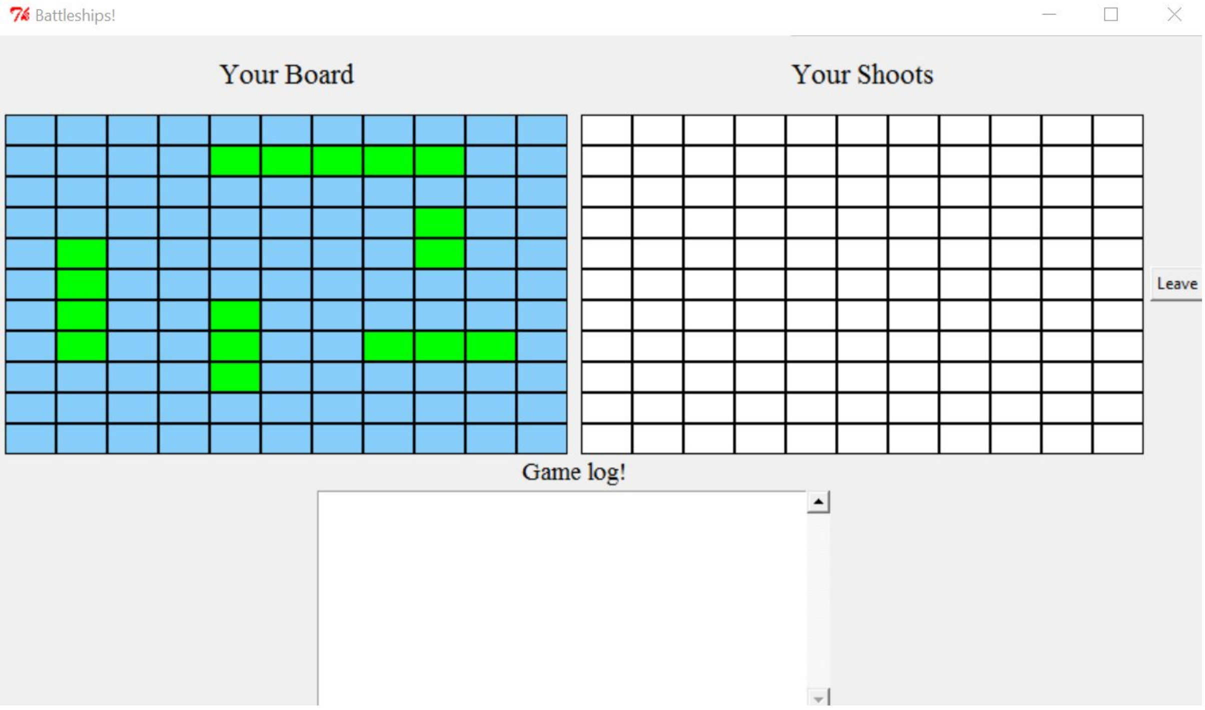
Here in the list of games each game session is in the next format: game id / board size / number of active players.

Choose the game and push the button “Join Game!”. After this you will see the next window:



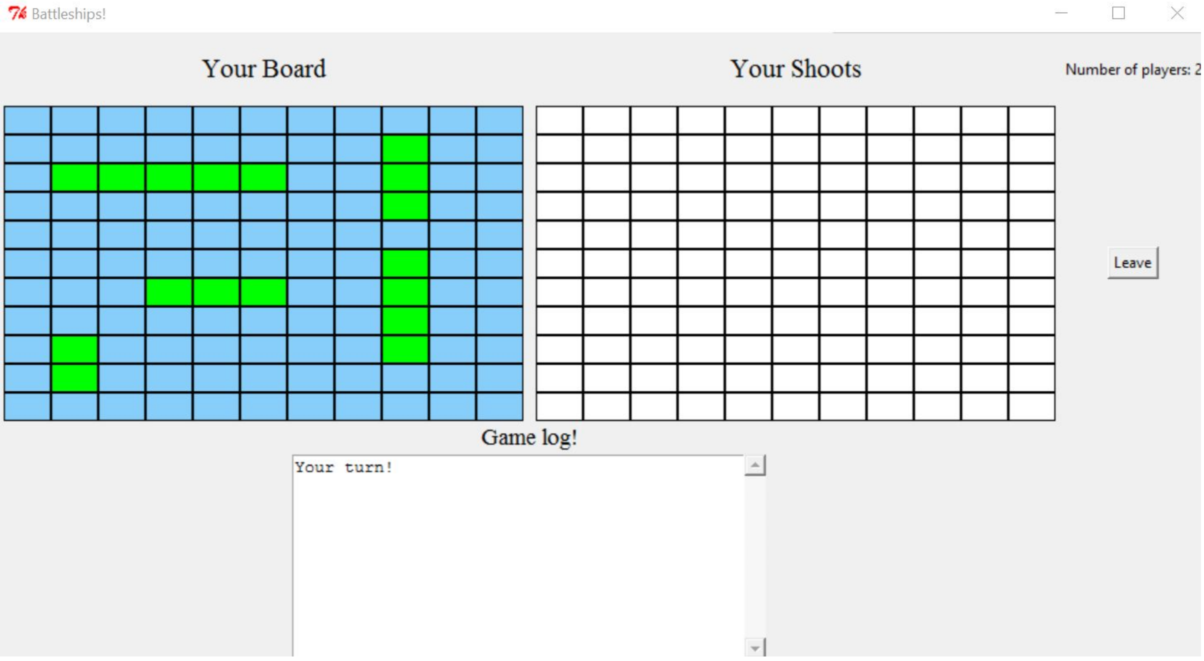
Here as it was mentioned before you must place your ships and push the button “Start game”. You need to mention that you can’t start the game if you not place all the ships (“Start game” button will be unclickable). If you place a ship and want to start again - click “OK” under Reset ships. After you placed all the ships, pushed the button “Start game” you would see the next window:



If you want to leave from the game push the button “Leave”. You will return to the window where you decide start new game or connect to existing one.

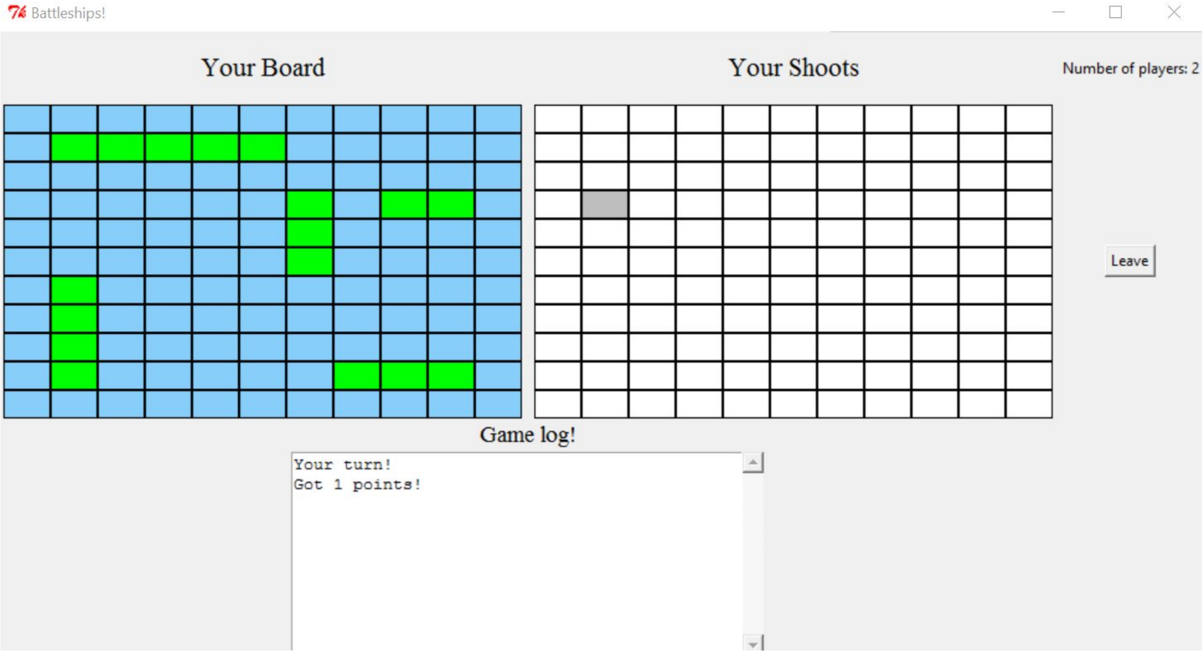
Game

When the master client started the game he is the first who makes the shoot. Clients shoot in that order in which they connected to current game session. In the Game log you will see the notification “Your turn!”. This notification will be shown to you every 10 seconds if you do not make any actions.



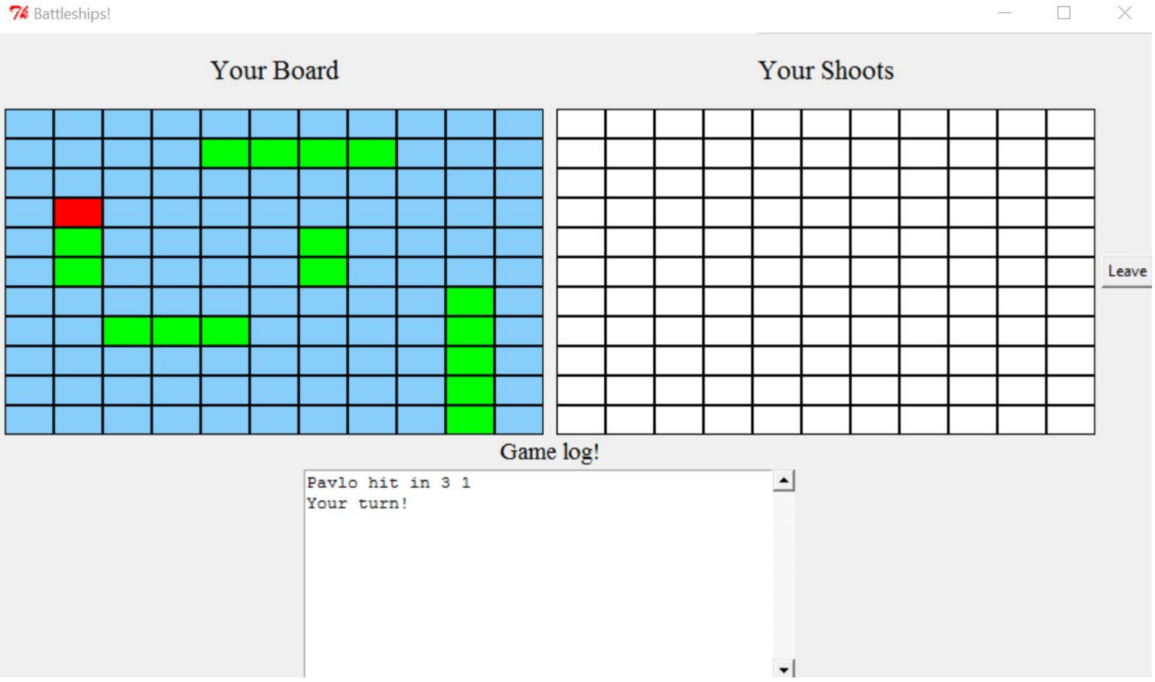
```
Your turn!
```

Current player make shoot on the board “Your Shoots”. After the shoot is made the sell paints in grey color.



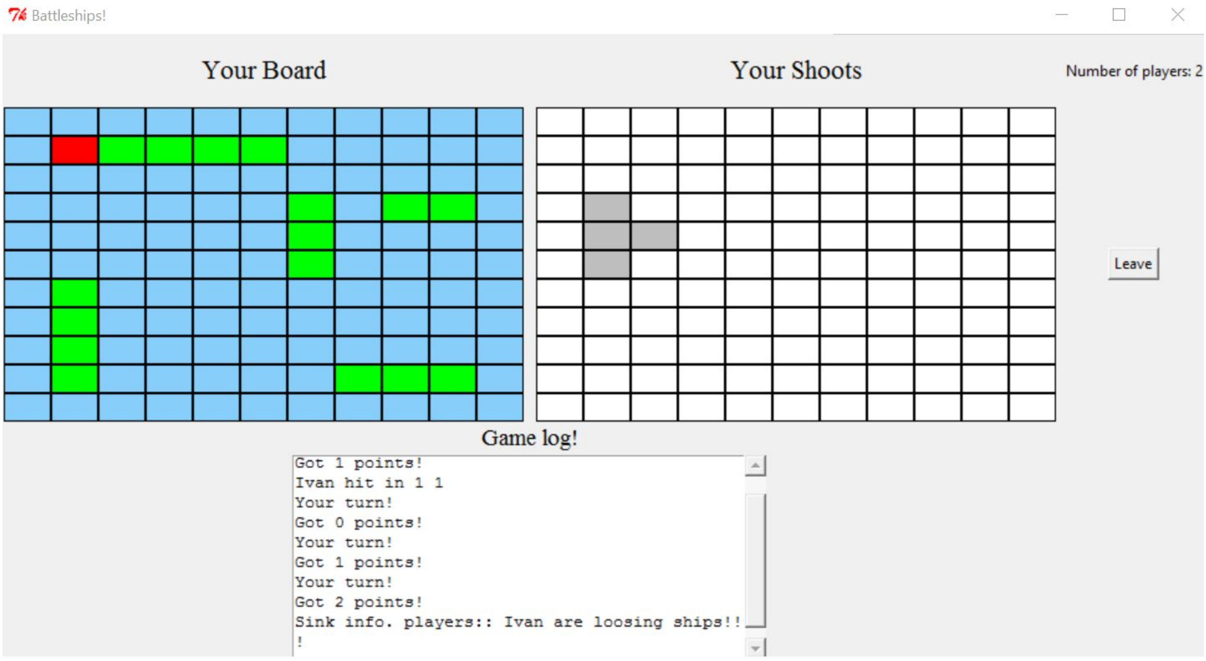
```
Your turn!
Got 1 points!
```

If you hit the target in the Game log you will see that you have got points (0 - if you missed, 1 - if you hit a ship, 2 - if you sank a ship). The hitted player will see that hitted part of his ship paints in red. In the Game log he will see the information about who hitted him and coordinates of a shoot.



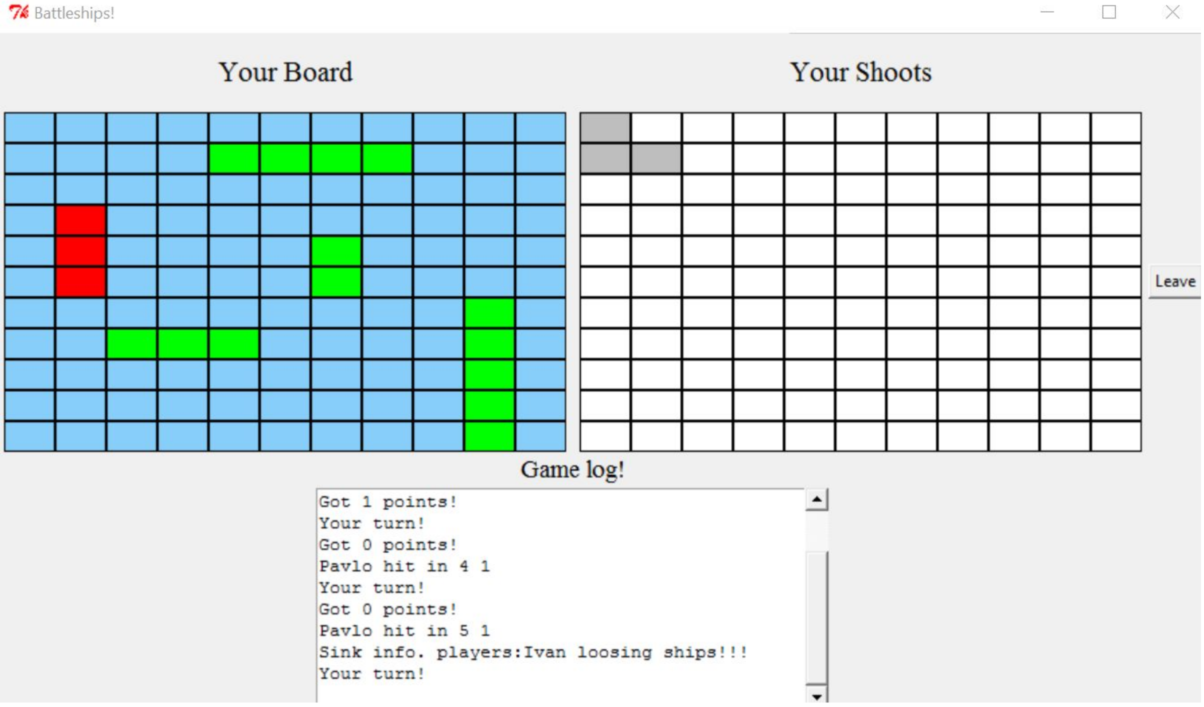
```
Pavlo hit in 3 1
Your turn!
```

If you sink the enemy ship you will see the information in the Game log: “Sink info: “enemy” losing ships”



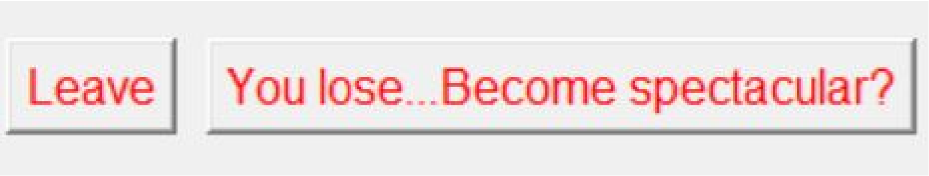
```
Got 1 points!
Ivan hit in 1 1
Your turn!
Got 0 points!
Your turn!
Got 1 points!
Your turn!
Got 2 points!
Sink info. players:: Ivan are loosing ships!!
!
```

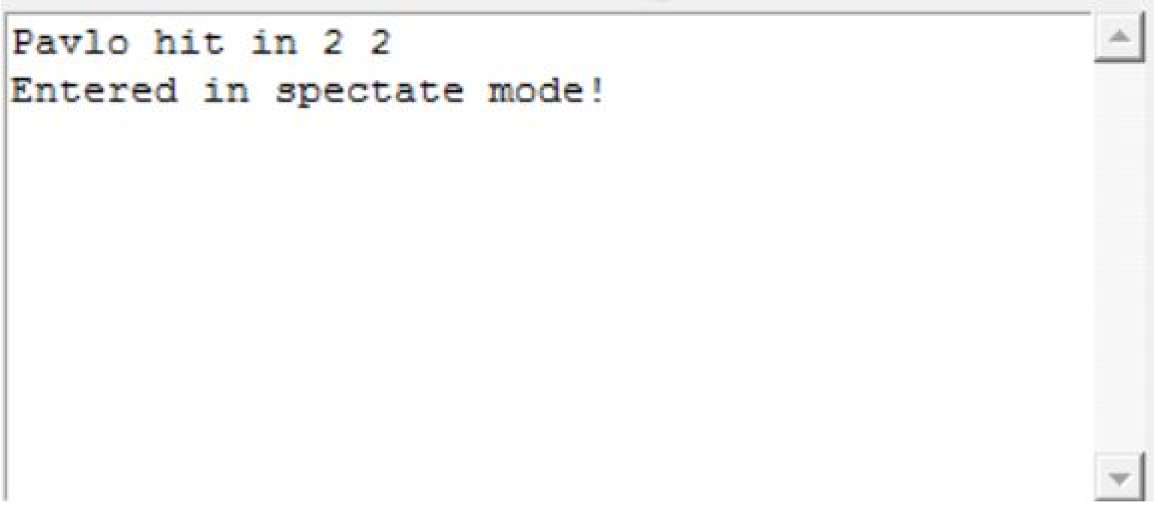
The same information will see hitted player.



```
Got 1 points!
Your turn!
Got 0 points!
Pavlo hit in 4 1
Your turn!
Got 0 points!
Pavlo hit in 5 1
Sink info. players:Ivan loosing ships!!!
Your turn!
```

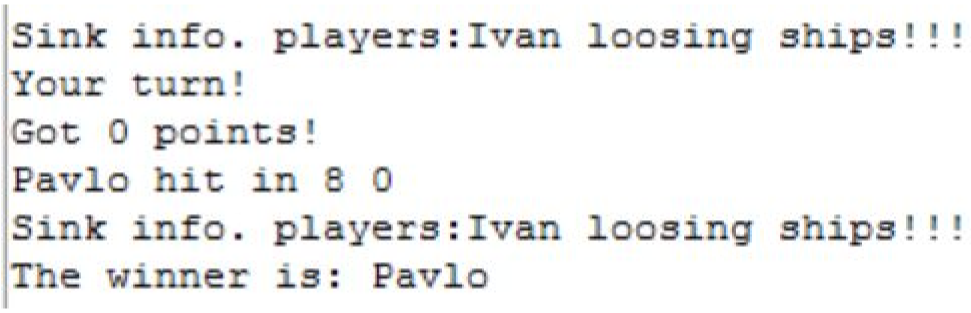
When one player lost all his ships he can leave from the game session or became a spectacular player.





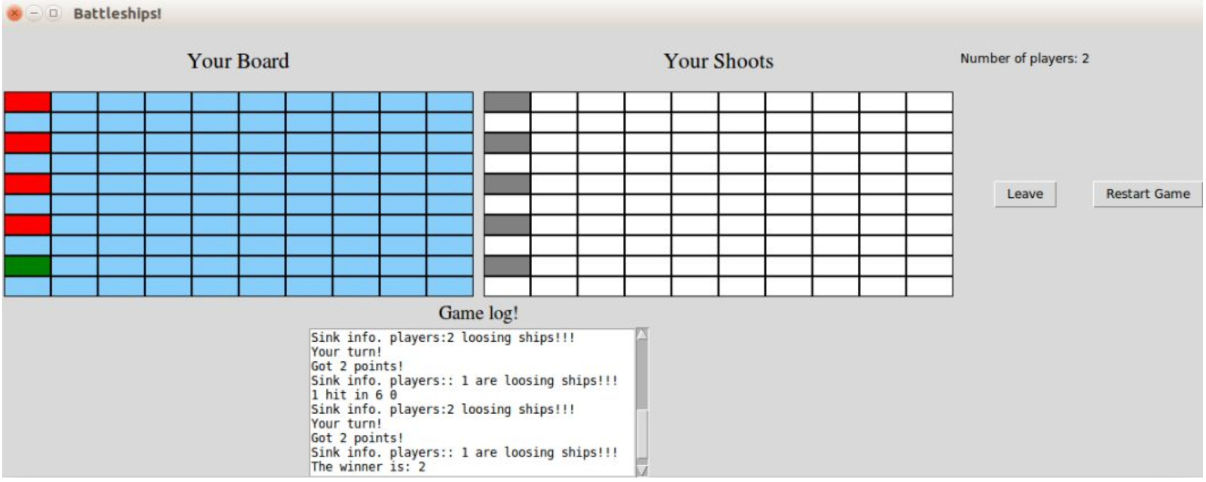
```
Pavlo hit in 2 2
Entered in spectate mode!
```

In case there would become a winner, he will see the following message: (Example)



```
Sink info. players:Ivan loosing ships!!!
Your turn!
Got 0 points!
Pavlo hit in 8 0
Sink info. players:Ivan loosing ships!!!
The winner is: Pavlo
```

Where “The winner is: name” will be announced.
After the few second all the remaining players will be notified of the winner.
When the game finished, means the is a winner of the game is exists the users will see the similar window:



```
Sink info. players:2 loosing ships!!!
Your turn!
Got 2 points!
Sink info. players:: 1 are loosing ships!!!
1 hit in 6 0
Sink info. players:2 loosing ships!!!
Your turn!
Got 2 points!
Sink info. players:: 1 are loosing ships!!!
The winner is: 2
```

If they want to start the game again they should click “Reset game”, otherwise - click “Leave” to exit the current game session.

Problems and bugs

All troubles origin from the Tkinter package. Tkinter package requires threading implementation and as we figured out python implementation pika for RabbitMQ not threading safety. The best solution in this case is to change Tkinter GUI on console output of battlefield, but when we found out this issue it was too late to change everything. So, sometimes there are possible unexpected errors in the battleship game session. Mainly, the cause is Tkinter (Tkinter exception). In case of this, please restart the program.

All the issues appeared from the client side. Server side is handling the request properly and gives correct responses at least to client requests.

Server side handling disconnection properly, while in client side there are some problems with it.

Problem situation: Game is finished and one of the players push the button restart. Some other player possibly didn’t receive the notification about finishing the game. In this case there will be unpredictable behaviour.

When you playing sometimes after you do some action - nothing changes. In this case you need to wait a little bit. This problem we saw only on the Ubuntu OS, in Windows everything looks fine. We didn’t search the origin of this problem scrupulously but, again, it is possibly problem of the Tkinter. Although Tkinter is cross platform package, on Windows it works fast, while on Ubuntu it worked for us slow.

We haven’t tested run the server on one computer and clients on other computers, currently everything goes fine on one local host.