**Pirate Bot Game Instructions**

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## **Introduction**

The pirate bot game is a turn-based game. In each run multiple games will run to check which player develops the most robust strategy.

* All games are with the same board and same timeout (maximum of number of turns allowed.
* In the beginning of each game, we randomly choose the order of the player turns.
* In each turn, the current player code is running (only one player plays).
* If the code crashes, the player loses.
* After each turn, we check if any player achieved the victory criterion. If so, game ends.
* If timeout reaches the game end and the result is draw.
* In the end of all games, we print the total results: number of wins for each player and number of draws.

## **Entities**

### Board

The game board in which your bots will compete. You can see all available board under **boards**.

Each board contain the following settings:

* Board\_size: notice it can change from one board to another.
* Blocks: list containing all blocks objects. Location units is relative to board\_size.
* Islands: list containing all islands objects. Location units is relative to board\_size.
* Player\_base\_island\_indices: assign a base island for each player. The position in the list represents which player gets this index and the value is the index in islands list defined above that is assigned to this player. For example: Player N gets the Nth index and islands[Nth index] is assigned to be his base island. In the example below: player 0 gets island[1] and player[1] gets island[0].
* Players\_ship\_speed: each players can have different speed. same explanation as above for the notation. Units are relative to board\_size
* Players\_num\_ships: each player can have different speed. same explanation as above for the notation. Units are relative to board\_size.
* Victory criterion: right now, there is only one option – num islands to conquer.

### Ship

Ships are your soldiers, they can:

* Move across the board
* Capture islands
* Increase/decrease islands life (dock on island)
* Destroy other ships (whether in sea or on island).

Each ship has the following attributes:

* ship id
* player id
* ship speed
* location
* frontend\_obj: object to draw that represents ship on the screen.

General rules:

* Ship staying on your island increases your island life by 1 each turn.
* Ship entering neutral island capture it on the same turn.
* Ship entering empty enemy island decreases island life by 1 each turn. If there are enemy ships on the island the ship kills one enemy ship and itself.
* Once captured island life reaches zero, it becomes neutral again.
* If two ships collide in the sea, they are both destroyed (whether they are of the same player or not).

### Island

Islands are places on board you want to capture to win the game.

Each island has the following attributes:

* Island id
* Own player id: equals -1 if island is neutral (aka no player owned the island).
* Location
* Ships: list of all ships that are docking in island right now
* Current life: HP of island.
* Ship\_creation\_time (currently not used): in future versions, islands will generate ships of owned player after number of turns pass.
* Frontend\_obj: object to draw that represents island on the screen.

### Player

Players are the objects which hold all yours and your enemies information.

Each player has the following attributes:

* Player id
* Player name
* Player do\_turn function
* ships

### Block

Blocks are locations on board you cannot move through.

Each block has the following attributes:

* block id
* location
* current life (currently not used): in future versions, ships will be able to destroy blocks.

## **Developing Bots**

### API

Access to current game and board status (players, blocks, islands and ships) is available through the API. You can see all available functions + documentation in classes\api.py.

**Don’t access any API’s attributes or underscore methods – they exist for internal use only! Using them will allow you to illegally change the game (will be solved in future versions).**

Let me know if you think more functions should be added to the API or if you find bugs/hucks.

### Your code

* You need to create python code in “**players**” folder with your name.
* **You don’t need to touch or change any other code other than this. Feel free to look at it if necessary.**
* In this code you must put all your strategy for a general turn in the following function:

def do\_turn(game\_api: game\_api.API):

* You can access all available API functions easily using game\_api.{relevant\_method}.

**Good luck and have fun - may the best player win!**

## **Versions**

* Version 1.0 was released on 13.05.24 (Independence Day!)
* Version 2.0 and later will include the following additions:
  + New rules
    - Islands owned by a player will generate ships according to pre-defined time for each island stated in board settings.
    - Ships will be able to destroy blocks and allow for ships passage.
    - Whirlpools / sea monsters – tiles that kills ships.
    - Allow to move up to maximum speed of ship and not **only in it.**
    - Add ship strength – decrease island life quicker.
    - Add different criteria for victory: destroy all or X enemy ships, capture all or X islands, capture enemy base island, etc. Can add combinations of all.
    - Add an option to play in simultaneous mode: in each turn all players play simultaneously and thus we can achieve draw.
  + Gameplay additions
    - Add more boards to play.
    - Add some basic strategies to the API which you can use.
    - Add option for more players than 2.
  + Visual improvements
    - Change to images instead of colored rectangles.
    - Show islands life
    - How to nicely visualize ship collided with blocks.
  + Better game code (not affecting players)
    - Change players code and board to be classes instead of functions.
  + Any more suggestions?