Python Project

Subject

Final date : 22th November 2020

1 Final Project

For your final grade, you have to make a small project with Python.

1. You need to create a simulation of a battle between robots
2. You can use Tkinter to do so, but another library is accepted if you want.
3. Create a README for the use of your program
4. Submit your file on Teams

2 Robots

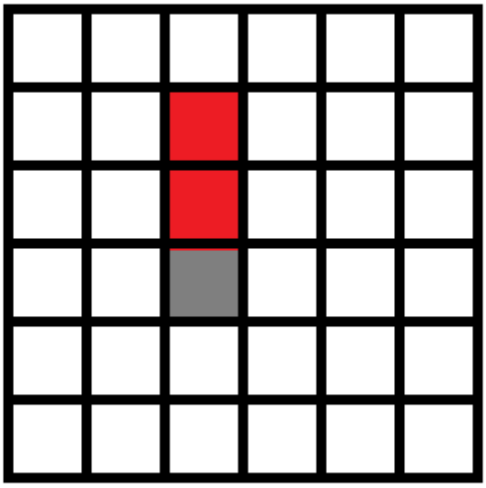
The robots are separated in two teams: the blue team and the red team. Each robot starts with one body and one weapon. The different bodies are:

- Simple body: it gives 2HP to the robot
- Hard body: it gives 5HP to the robot
- Light body: it gives 3HP to the robot and gives +1 Mvt
- Battle body: it gives 2HP to the robot and adds +1 weapon slot

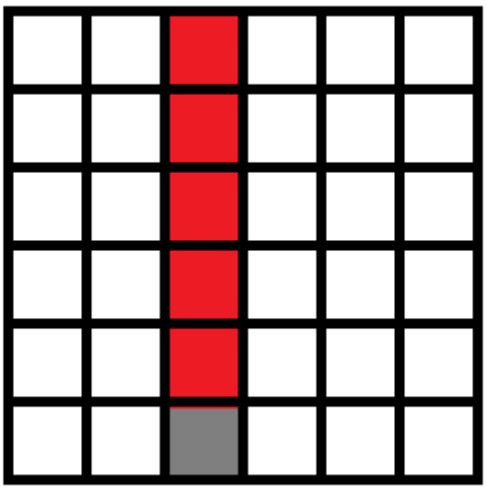
The different weapons are:

- Basic weapon: it does a basic shoot for 1HP
- Laser: it shoots all the cells in front of the robot for 1HP
- Sword: it slashes in front of the robot for 2HP
- Explosion: it explodes for 1HP in an area around the robot
- Dual Laser : it shoots all the cells on the sides of the robot for 1HP
- Twin weapon: it adds +1 weapon slot to the robot

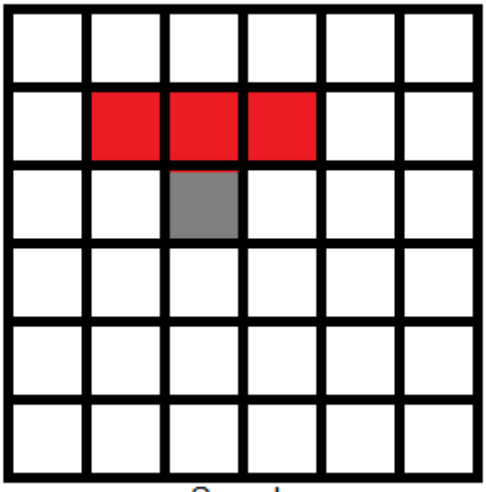
The different area of effects of each weapon is shown on the pictures below. The grey cell represent the robot and the red line on this cell represent the direction the robot is facing.



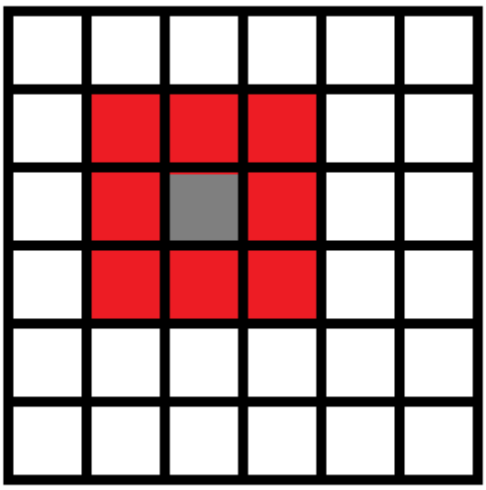
Basic shoot



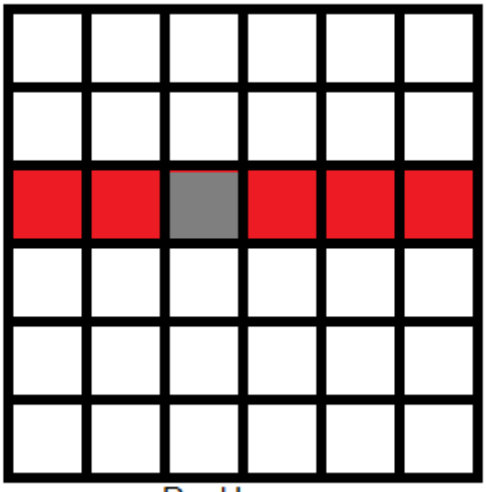
Laser



Sword



Explosion

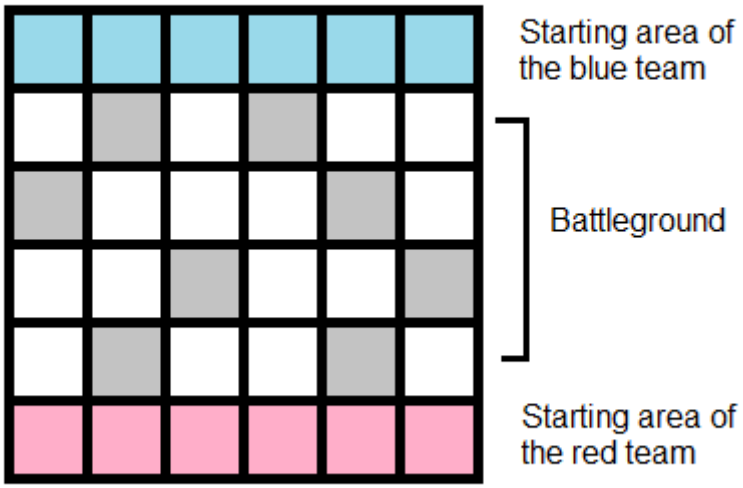


Dual Laser

Each robot starts with a simple body, a basic weapon, 1 weapon slot and 1 Mvt. When a robot is destroyed, it drops a random weapon or a random body. At the beginning of its turn, each robot move from 1 cell for each of its Mvt. It can move up, down, right or left. After that, it can change the direction its facing, then use all of its weapons equipped. If a robot moves on a cell where a weapon or a body has been dropped, it takes it. A robot can have 1 body equipped and 1 weapon equipped for each weapon slot.
Each robot has a behavior. The basic behavior is to do everything randomly, but you can create specific behaviors (this will give you bonus points) like "aggressive" or "defensive" for example.

3 Arena

The robots are fighting in a square arena of 6x6 cells. The robots of the blue team start in the first line and the those of the red team in the last line. The position of the robots is random at each new battle. The arena also change at each new battle with 8 deactivated robots randomly placed on the battleground (and not on the starting area of each team). Those robots are represented by grey cells on the picture below. Deactivated robots are obstacles with 1HP and they drop a weapon or a body when they die.



4 Interface

The interface needs to have at least a menu with the option to quit and create a new battle. The board needs to be visible and a button should be present to add a new step to the game. The interface should also give the possibility to decide the number of robots present on each side.

5 Bonus

It is possible to add more options to the battle like: having a bigger board, replace deactivated robots by neutral robots, etc. Bonus points will be granted if more options are added to the project.