Game - Scientific Python

About the game

The map consists of a black background and grey rectangles with random size and placement that are generated throughout the game. Red balls represent the “enemies” in the game, and the triangles are the “ships” that the agents use to shoot the balls.The goal of the game is to shoot as many red balls as possible. The agent that shoots the most balls wins the game. A counter will be counting the number of red balls that the agent has shot, this will be used as a scoreboard. At this moment of the game-development stage, the agents are just applying a random force on the triangle. The plan is to make the agents shoot any red ball if it gets within a certain distance from the ship. The ships are chosen to have a 50 bullet limit for the shooting. This is so that when the agents get smarter in phase two, they cannot just shoot bullets all the time.

The agents get the relevant information about the state of the game through the API. They also get the option to make the API change the movement of the ship. They do this by making the API send a post message to change the state of the game. The simple actions that the agents are chosen to do is to apply clockwise force on triangle, apply counterclockwise force on triangle, apply force in the direction of the “nose” of the triangle/ship (thrust) and to shoot.

The game is implemented in Python using “pygame” for the visual interface, “pymunk” for the physics engine, and “FastAPI” to allow communication between the agent and the game simulation. Bullets are implemented as circular objects in the world, and a limited number can be used by each ship. Obstacles (the grey rectangles) are randomly generated during the game and can affect the movement of agents and the trajectory of bullets.

Read the README.md in GitHub for more technical information.

Work distribution

Planning of the game: Birk, Jonas, Haakon.
Coding: Since Haakon is the most experienced with coding in Python, he has been selected to take on the most responsibility for the coding, while Jonas and Birk are being delegated coding tasks.
Administrative planning: Jonas and Birk are the main coordinators of meetings, working schedules and other administrative tasks.