• Carry out the challenge in Python. • Create a repository on Github.

The challenge

Consider the following hypothetical game very similar to Monopoly, where several of its mechanics have been simplified. In a game of this game, the players change in rounds, in a randomly defined order at the beginning of the game. Players always start a match with a balance of 300 to each one.

In this game, the board consists of 20 properties in sequence. Each property has a selling cost, a rental value, an owner if they are already purchased, and they follow a certain order in the board. It is not possible to build hotels and any other improvements over the properties of the board, for simplicity of the problem.

At the start of his turn, the player rolls a 6-sided equiprobable die that determines how many spaces on the board the player will move.

- Upon landing on an unowned property, the player can choose whether or not to buy the property. This is the only way a property can be purchased.

- When he lands on a property that has an owner, he must pay the owner the rent for the property.

- Upon completing a turn on the board, the player gains 100 balance.

Players can only buy property if it has no owner and the player has the money from the sale. When buying a property, the player loses money and gains ownership of the property.

Each of the players has a different behavior implementation, which dictates the actions they will take throughout the game. More details about the behavior will be explained later.

A player who has a negative balance loses the game, and no longer plays. It loses its properties and therefore can be bought by any other player.

It ends when there is only one player left with a positive balance at any time during the game. That player is declared the winner.

We want to run a simulation to decide which is the best strategy. For this, we idealized a game with 4 different types of possible players. The defined behaviors are:

- Player one is impulsive;

- Player two is demanding;

- Player three is cautious;

- Player four is random;

The player impulsive buys any property he lands on.

The player demanding buys any property as long as its rent is greater than 50.

The cautious buys any property as long as he has a reserve of 80 balance left player after the purchase is made.

The player random buys the property he lands on with a 50% probability.

If the game takes too long, as is usual in games of this nature, the game ends on the thousandth round. with the victory of the player with the most balance. The tiebreaker is the turn order of the players in this match.

Exit

An execution of the proposed program must run 300 simulations, printing in the console the referring data to executions. We hope to find the following information in the data:

- How many matches end by time out (1000 rounds);

- How many turns on average does a game take;

- What percentage of wins by player behavior;

- Which behavior wins the most?