LINFO1361: Artificial Intelligence
Assignment 3: Pontu's rules and simulator

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Guidelines

- For the third assignment of the LINFO1361 course, you will have to imagine and implement an IA player able to play the **Pontu** game. This document describes the rules of the game and gives information on how to use the Python simulator provided on Moodle.
- The objective of this simulator is to allow you to test the game, understand his mechanics and look for efficient strategies and heuristics in advance.
- This is document does **NOT** describe the third assignment of the course LINFO1361. The instructions will follow later on.
- The *Pontu simulator* zip file provided on Moodle is **NOT** the project you will use for the assignment. It is just a tool provided to simulate the Pontu game. You don't need to modify any of the lines of code, you just have to run the script to launch a Pontu game. The python project for the assignment will be released on Moodle later.

1 Rules

The rules of the game can be found in French via this link:
`https://cdn.1j1ju.com/medias/91/ea/61-pontu-regle.pdf`.
For the assignment we will **not** use the variant proposed in the rules.

For English speakers, here is a summary of the rules :

The goal of the game is to isolate all of your opponent's elves.
At each turn each player moves one of their elves from one circle/isle another by passing over a bridge and then removes one of the bridges, whichever they want, from the game board.
An elf can only move from one circle/isle to another if there is a bridge between the circles/isles.
Two elves (no matter if they have the same color or not) cannot be in the same circle/isle at the same time.
The last player who is able to move one of his elves wins the game.
In case one player cannot move any elves, because another elf is blocking the move, this player has not yet lost. He must only remove a bridge from the board without moving any elves.

2 Simulator

To start a game with the Pontu simulator you first need to download and extract the `Pontu_simulator.zip` file that is on Moodle.
The simulator was implemented in **Python** and works with versions greater than or equal to **3.6+**. You will need to have the `pygame` package installed on your python environment. If it is not already the case, you can install it with the following line :

```
pip install pygame
```

To launch a new game you just have to execute the `pontu_play.py` script as follows:

```
python pontu_play.py
```

Once the script is executed, a pygame window will open as presented in Figure 1.
To play a turn, you first have to click on a valid elf/pawn, then click on a valid destination circle/isle and finally click on a valid bridge to remove. **The state of the board will be updated once the three actions are completed, not before.**

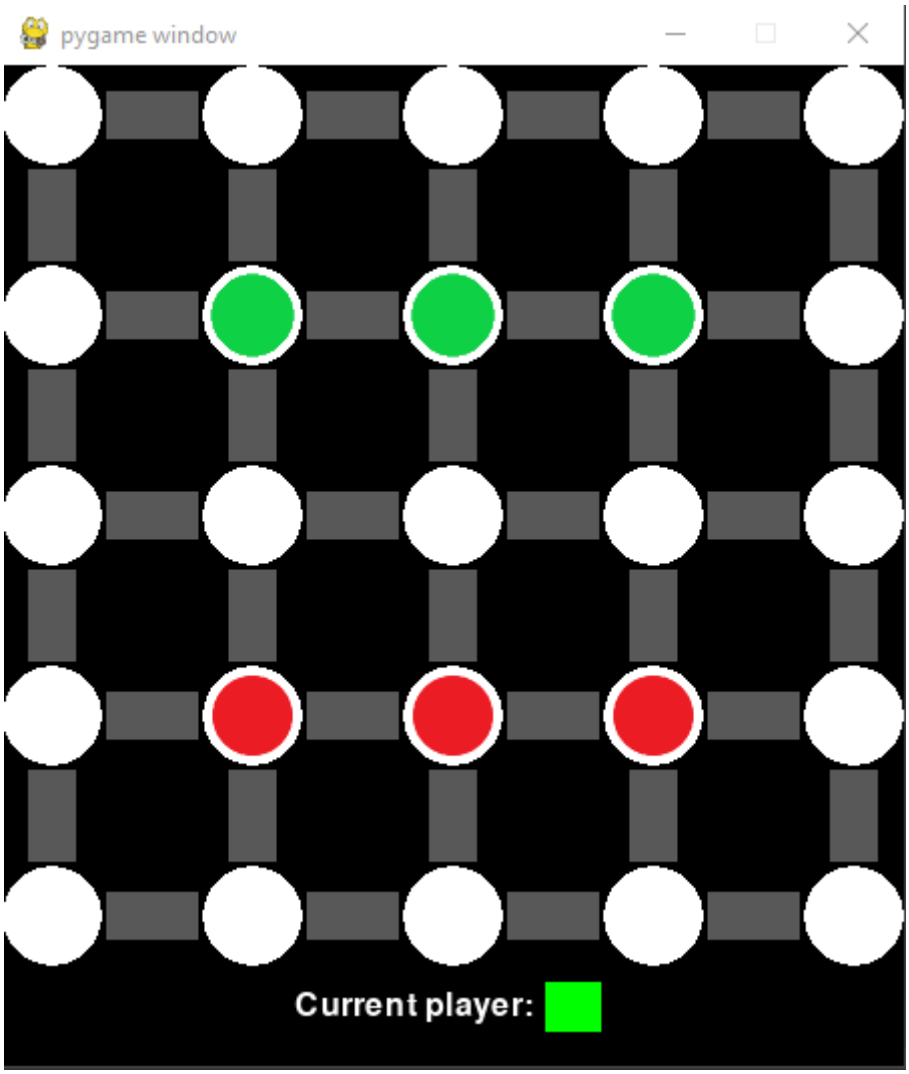

Figure 1: Pygame window of the Pontu simulator. The board corresponds to the initial position of the elves/pawns.