Project

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Based on the game tic-tac-toe, how can you develop an MCTS tree search algorithm that can reliably beat a random agent ?

- Create the environment along with the terminal conditions where the reward is 1 for the winner and 0 for the loser.
- The opponent is purely random at all times, the play of the opponent can be seen as part of the transition function.
- You play the circles (the opponent has already played first).

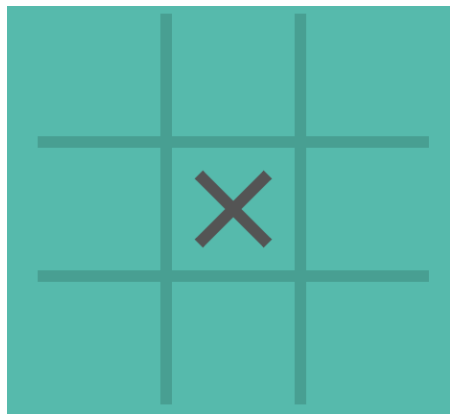

FIGURE – Illustration of the starting state for tic tac toe.

Project

Your need to provide :

- A report with
  - a description of the main parts of your algorithm (4 points)
  - vizualisation of at least one game (with insight about some winning probabilities for the actions) (3 points)
  - provide meaningful information about the convergence process (3 points)
- You should provide the source code of your scripts (python). You are allowed to use existing code for the tic-tac-toe game (not necessarily easier !) as long as you mention the source explicitly both in the code and in the report.
- Groups of 2, different from previous projects.

Hints for the project

Here are the first things you need to find out :

- A way to encode the state of the game.
- A way to encode all possible actions given a state.
- You need to "code" the conditions for a terminal state and whether it is a winning/losing position for the circles.