AI Open Ended Assignment

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Submitted to: Ms. Sunita Bharve Ma'am **Date:** 24/10/2020

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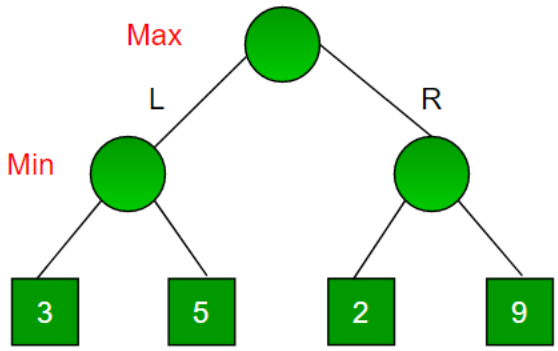
Tic-tac-toe using Minimax Algorithm

Check out game simulation: https://sanskarzulu.github.io/Tic-tac-toe-using-Minimax-Algorithm/

GitHub link of same: https://github.com/SanskarZulu/Tic-tac-toe-using-Minimax-Algorithm

Minimax Algorithm

Minimax is a kind of backtracking algorithm that is used in decision making and game theory to find the optimal move for a player, assuming that your opponent also plays optimally. It is widely used in two player turn-based games such as Tic-Tac-Toe, Backgammon, Mancala, Chess, etc.

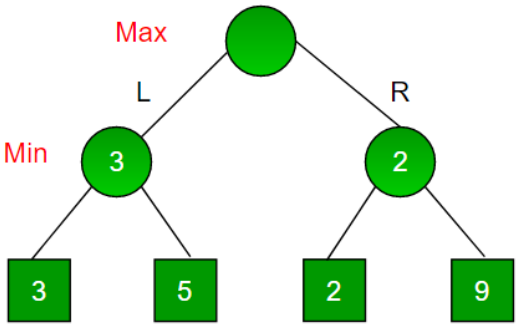


Since this is a backtracking based algorithm, it tries all possible moves, then backtracks and makes a decision.

- Maximiser goes LEFT: It is now the minimizers turn. The minimizer now has a choice between 3 and 5. Being the minimizer it will definitely choose the least among both, that is 3
- Maximiser goes RIGHT: It is now the minimizers turn. The minimizer now has a choice between 2 and 9. He will choose 2 as it is the least among the two values.

Being the maximiser you would choose the larger value that is 3. Hence the optimal move for the maximiser is to go LEFT and the optimal value is 3.

Now the game tree looks like below :



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Implementation of Tic-Tac-Toe game

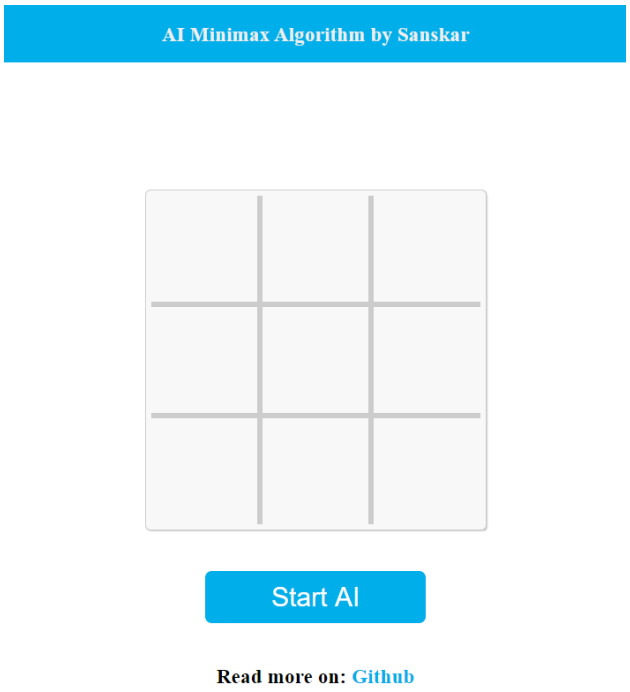
Rules of the Game

1. The game is to be played between two people (in this program between HUMAN and COMPUTER).
2. One of the player chooses ‘O’ and the other ‘X’ to mark their respective cells.
3. The game starts with one of the players and the game ends when one of the players has one whole row/ column/ diagonal filled with his/her respective character (‘O’ or ‘X’).
4. If no one wins, then the game is said to be draw.

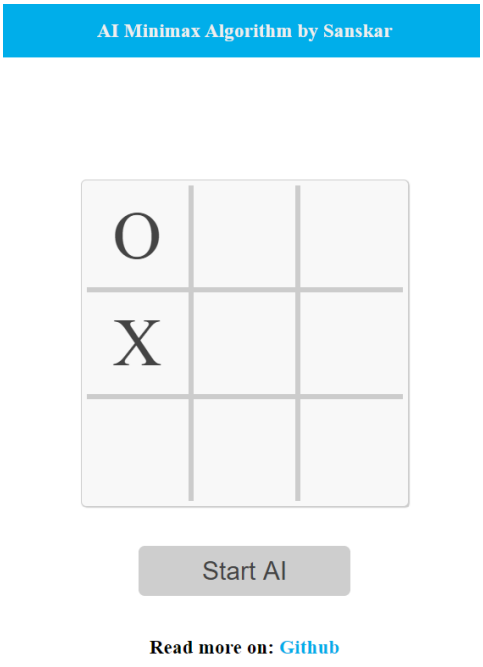
0	X	0
0	X	X
X	0	X

Output:

1



2



3

4

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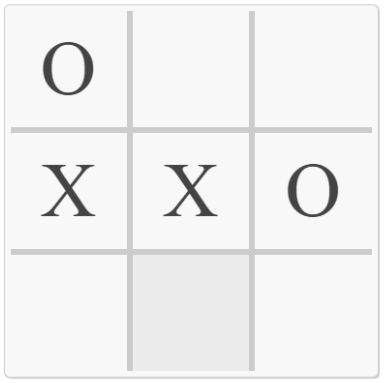
AI Minimax Algorithm by Sanskar



Start AI

Read more on: Github

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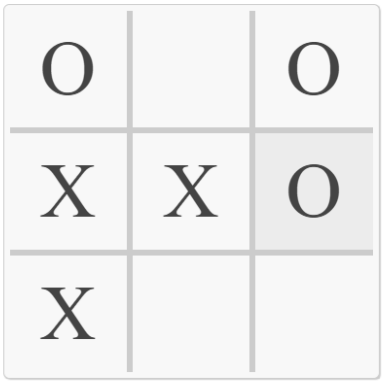

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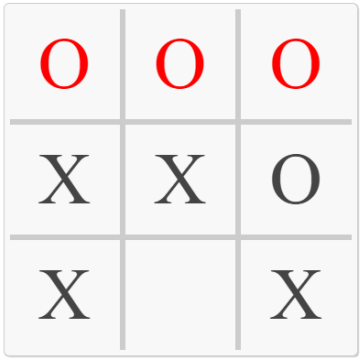
You lose!



Restart

Read more on: Github

Either you will lose or if you're good, you will end up with a draw…Try your luck!

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