

# Game Ai- Project #1

## Group Members

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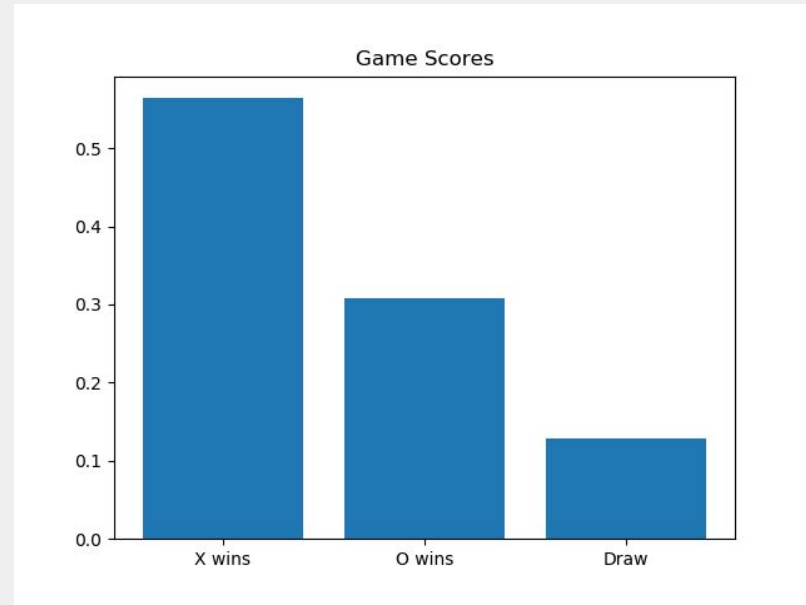
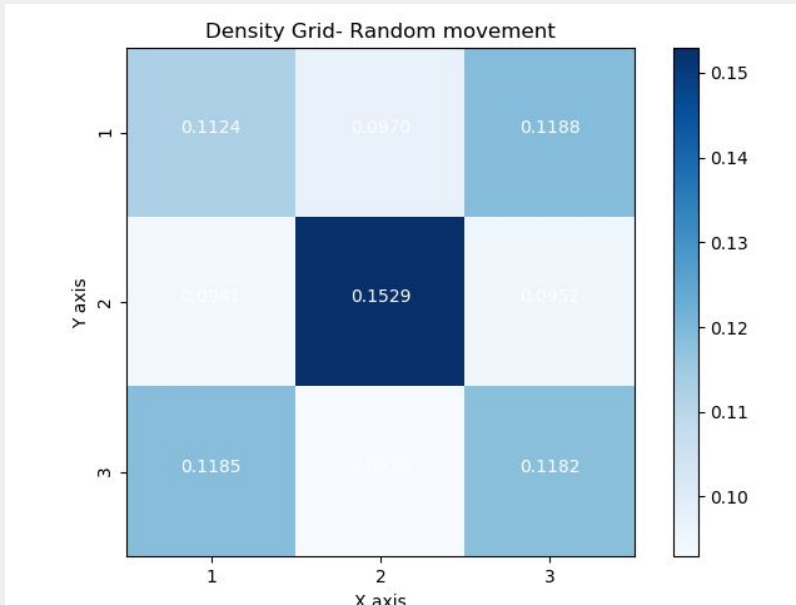


# TicTacToe

- Simulate the game TicTacToe for 1000 times in 4 different strategies
- Player-X always starts the game and player-O follows.

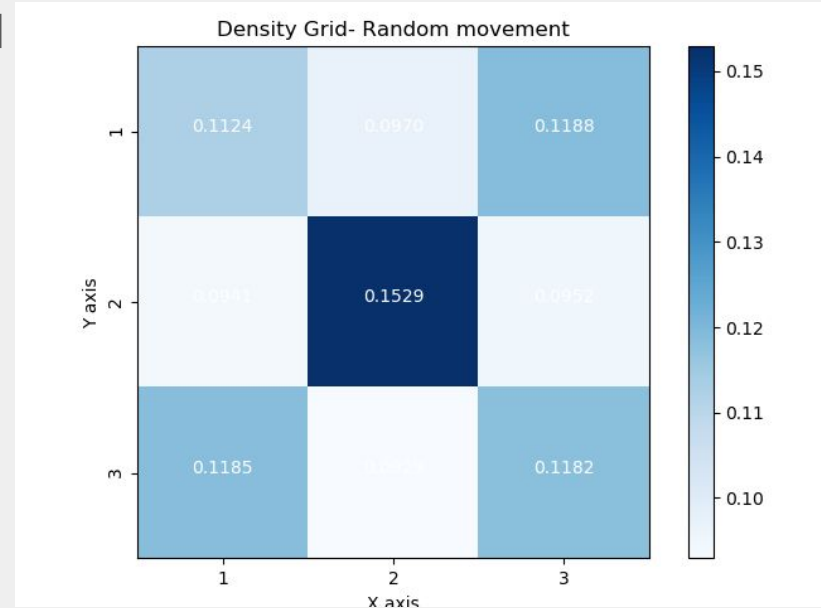
# TicTacToe: First Strategy

- Both players play randomly.
- **Density Grid** was saved for later use



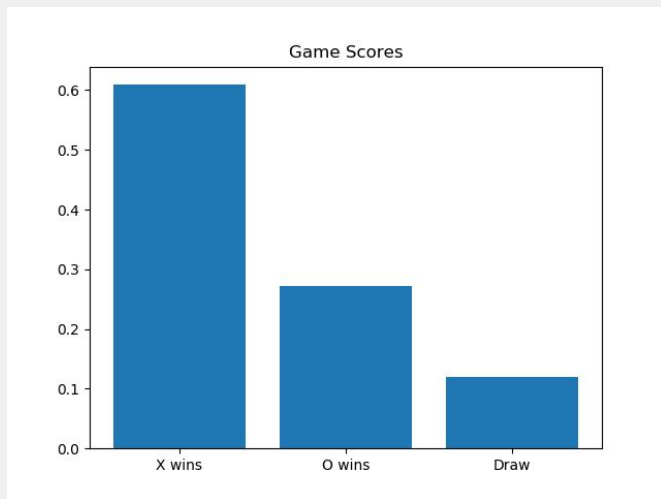
# TicTacToe: Second Strategy

- One player moves based on Density Grid from S#1.
- We determine the unoccupied cells and **choose randomly** among the ones remaining based on **weights** driven by the density grid.

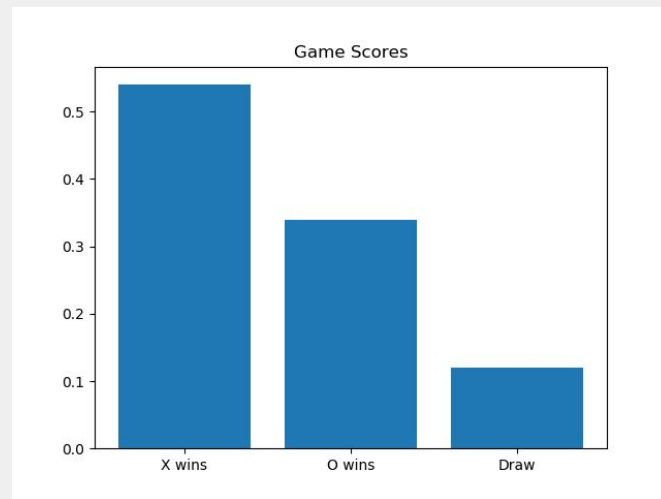


# TicTacToe: Second Strategy

→ Player-X utilizes the strategy.

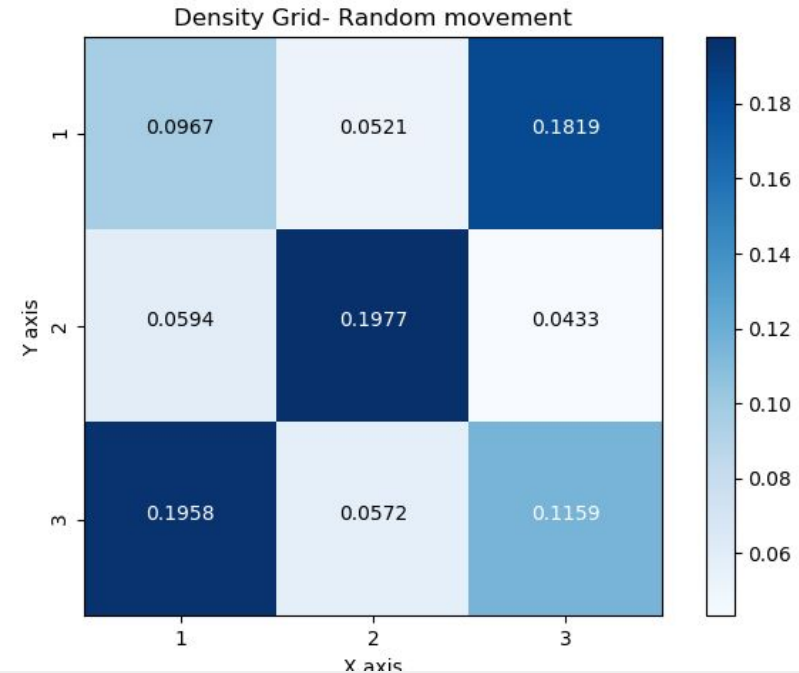


→ Player-O utilizes the strategy.



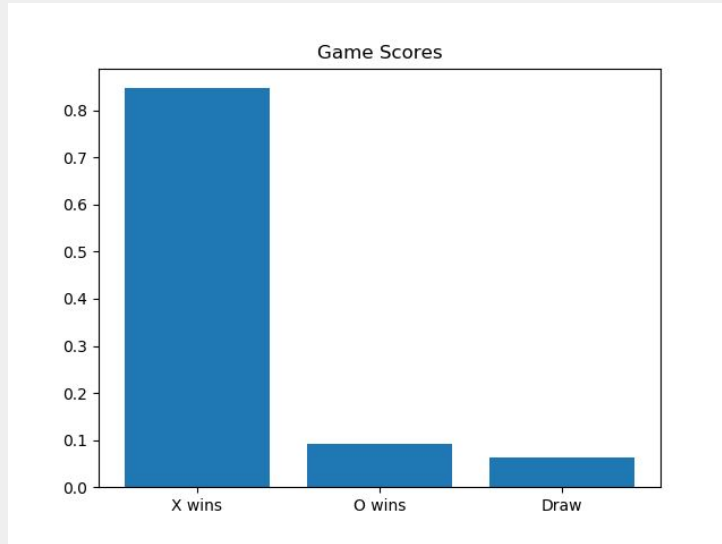
# TicTacToe: Third Strategy

- One player moves based on Density Grid from S#1.
- We determine the unoccupied cells and choose **the maximum probability** among the ones remaining.

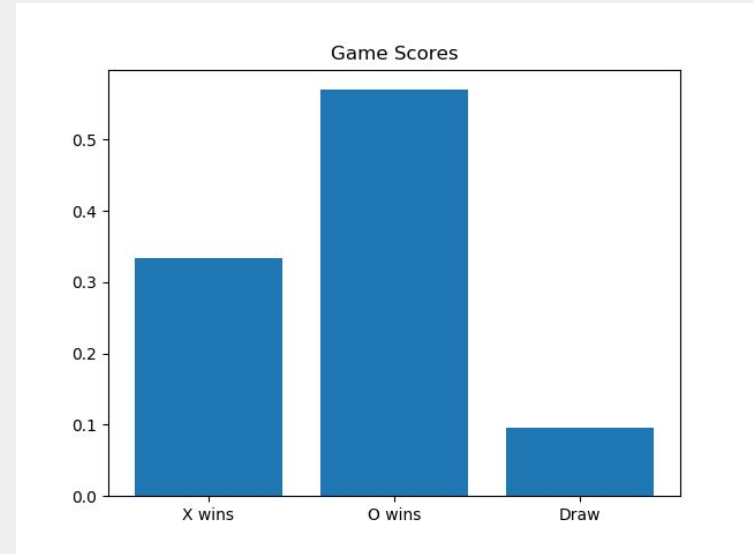


# TicTacToe: Third Strategy

→ Player-X utilizes the strategy



→ Player-O utilizes the strategy



# TicTacToe: Fourth strategy

→ One player plays heuristically, other plays randomly.

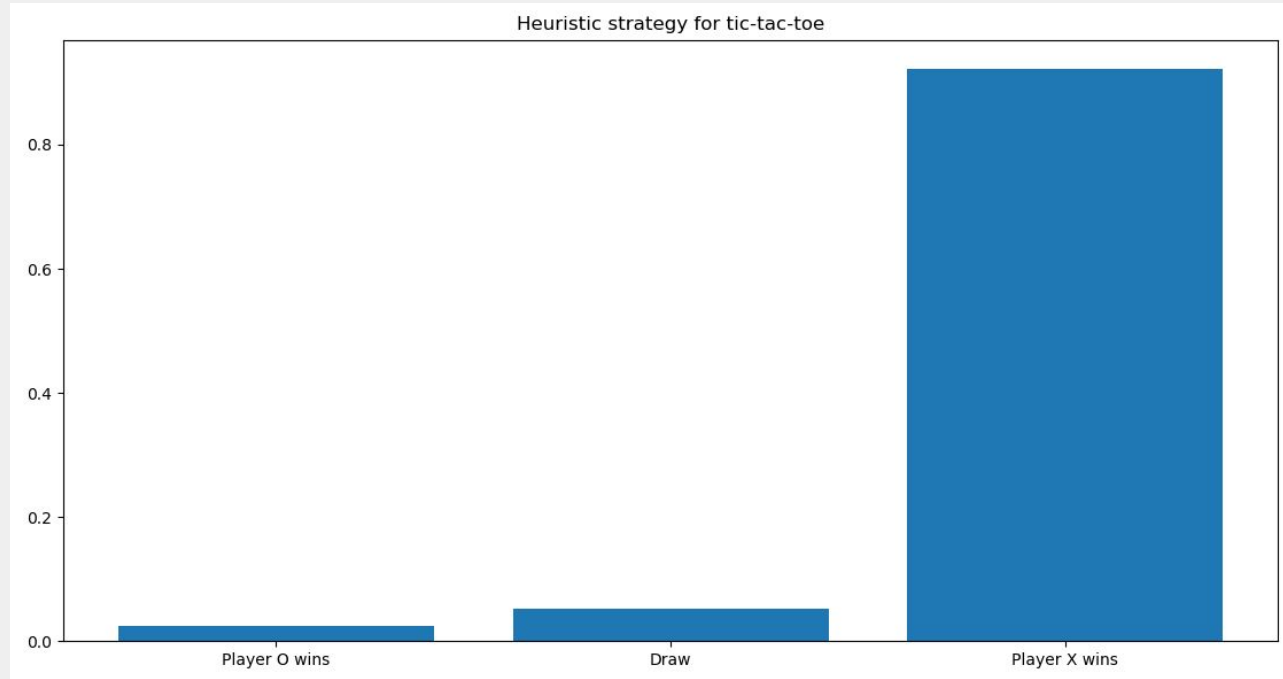
→ **Heuristic Evaluation Function**

$Eval(n, p) = (\text{number of lines where } p \text{ can win}) - (\text{number of lines where } -p \text{ can win})$



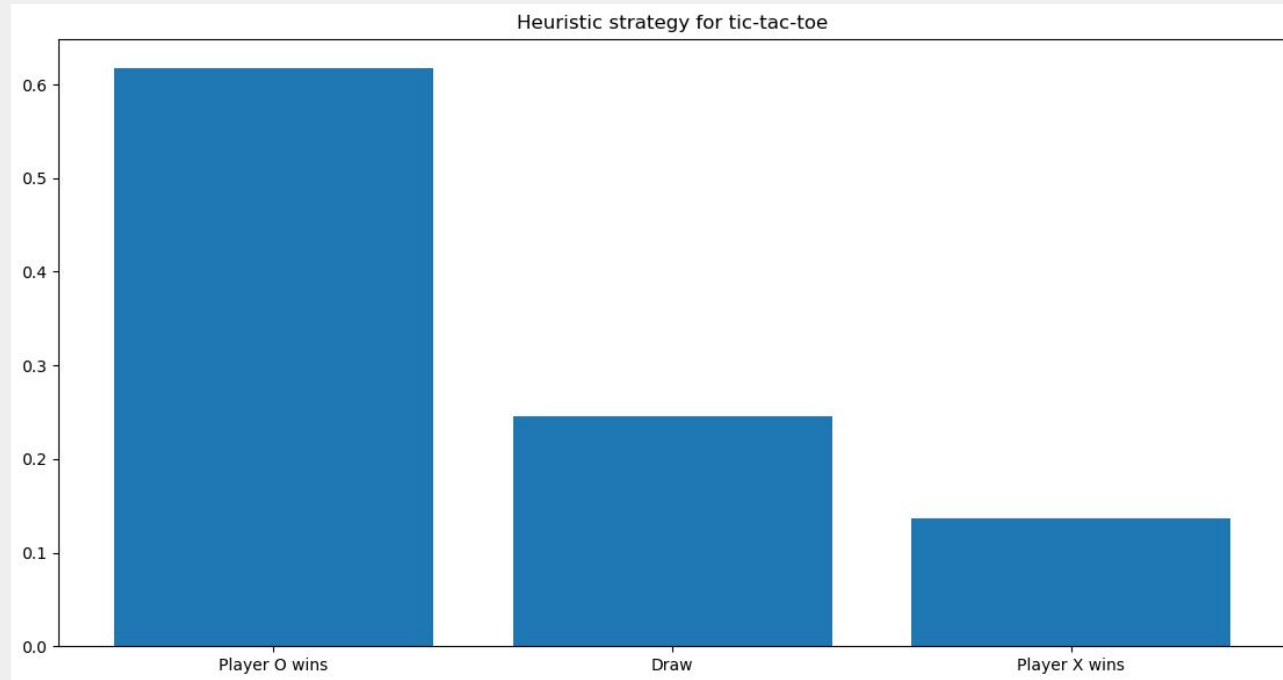
# TicTacToe: Fourth strategy

→ Player-X utilizes the strategy



# TicTacToe: Fourth strategy

→ Player-O utilizes the strategy



# Connect Four

- For each move we count the cells around the last move to check if it is a winning move
- ◆ Vertical check
  - ◆ Horizontal check
  - ◆ Diagonal check (bottom left to top right and top left to bottom right)

# Connect Four

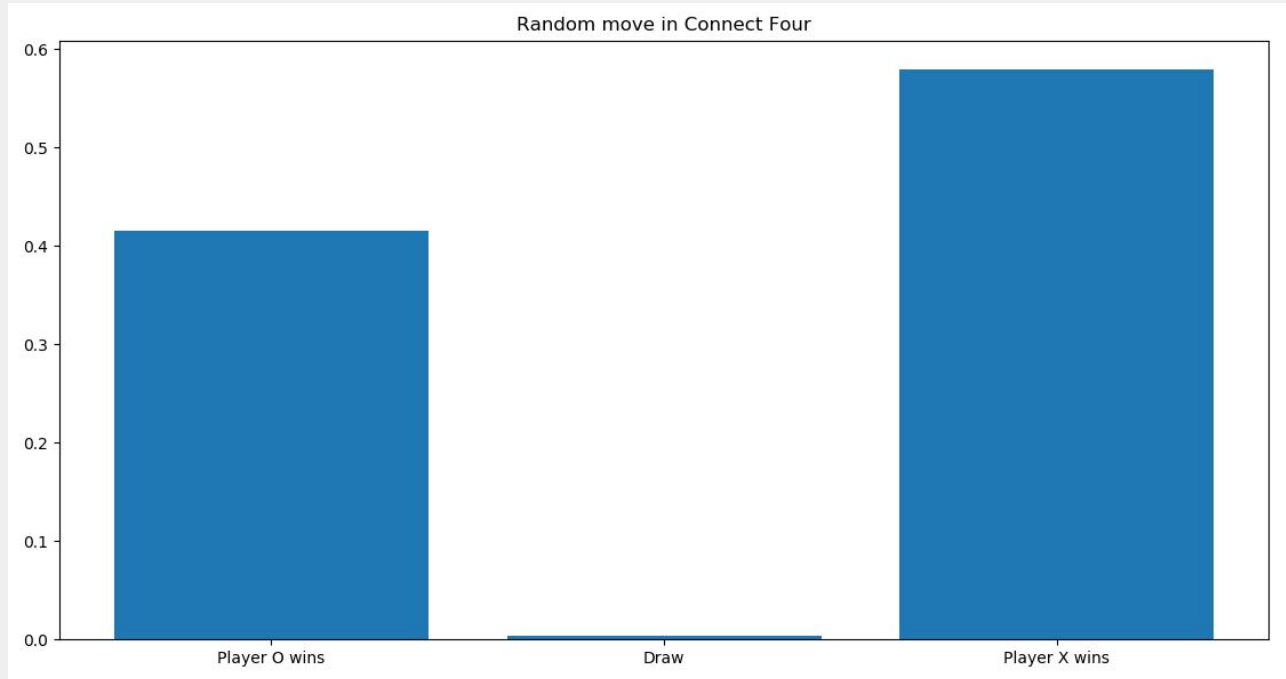


(lastMoveRow, lastMoveCol)

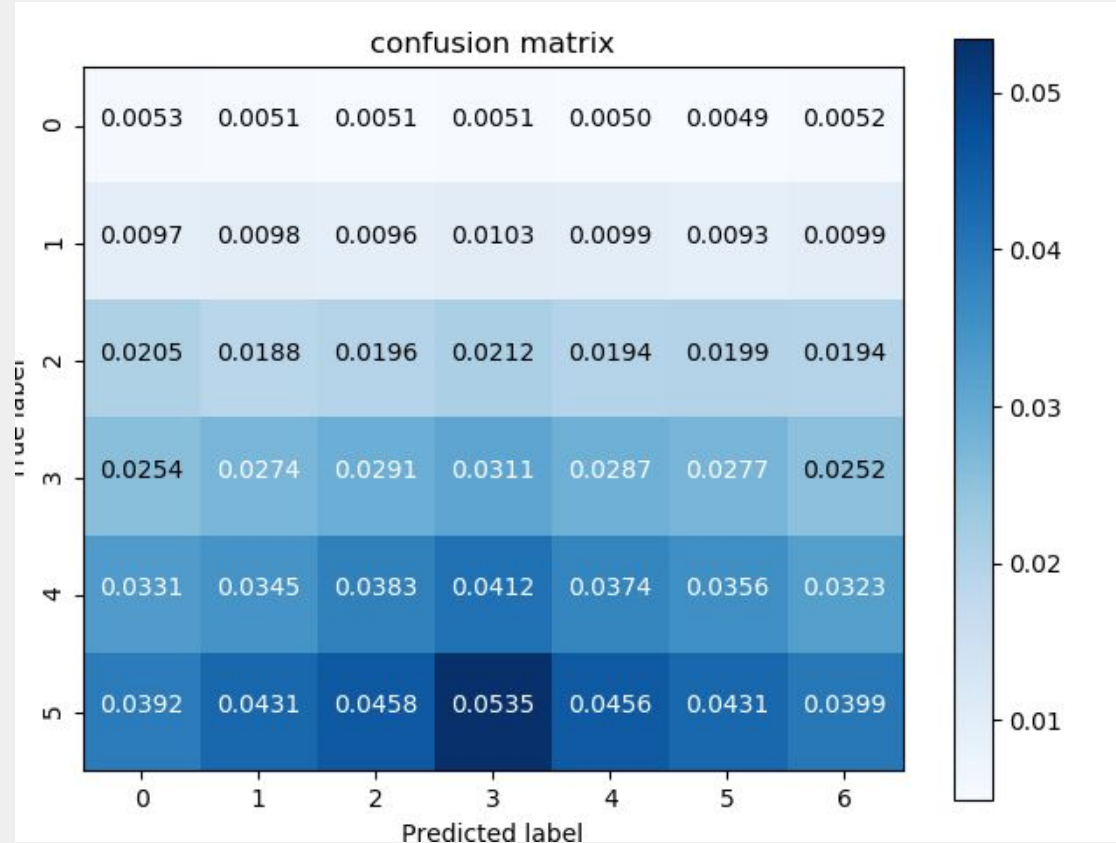
			X			
		X	X			
		O	X			
O	O	O	X			

# Connect Four Tournament

→ Both players play randomly for 1000 times



# Connect Four Tournament



Thank you for your attention.

Questions?