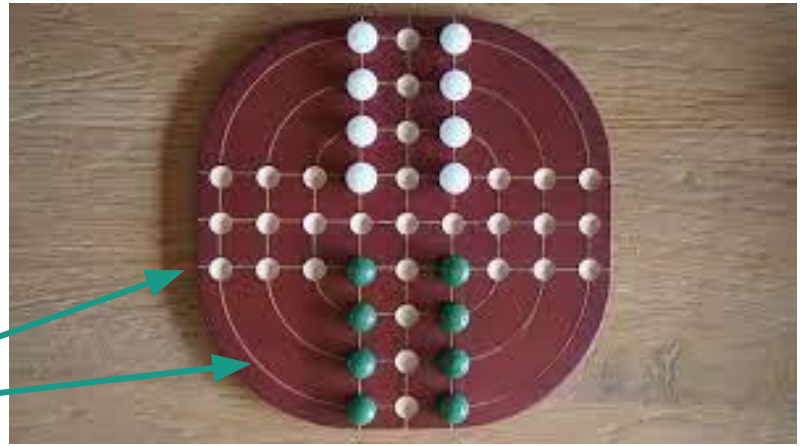
Artificial Intelligence: Wana

Wana - Game Description

- Wana is a 2 player board game.
- Each player has 8 pieces.
- The game ends when one player manages to block all moves of a single opponent piece
- Pieces can move in any direction, as long as there isn't another piece blocking its path
- Pieces can move along the lines leading to the outside of the board, and appear on the opposite side
- Pieces can move along the circular lines



Problem Specification

State Representation: matrix, where each element $\in$ {OUT, EMPTY, PLAYER1, PLAYER2}

Initial State: Matrix is initialized according to the game rules

Objective Test: Loop through matrix and check if there is a piece with no possible moves

Operator: Move(X, Y)

- Preconditions: position Y, must be empty
- Effect: move the piece from X to Y
- Cost: 1

Heuristics

- Heuristic 1 = Number of moves that the player has for all pieces
- Heuristic 2 = - Number of moves that the opponent has
- Heuristic 3 = Heuristic 1 + Heuristic 2
- Heuristic 4 = 100 * (X2 - X1) + 5 * (Y2 - Y1)
    - X1 - Number of pieces of player with 0 moves
    - Y1 - Number of pieces of player with 1 move
    - X2 - Number of pieces of opponent with 0 moves
    - Y2 - Number of pieces of opponent with 1 move

Project Development

Programming Language: Python, using pygame and pygame_menu
Development Environment: VS Code
Data Structures: Lists of integers are used to represent the board
Progress: A lot of work has already been completed, but there is always room for improvement