Project Overview

COMP30024 Artificial Intelligence

Prof Chris Leckie

This year's project

- Design, build and evaluate your own autonomous game playing agent

- Your game playing agent should be able to play against either a human player
or another game playing agent
(and maybe beat them)

Game of HexiFence

- HexiFence a two-player strategic board game
- Two players (blue and red) take turns to place their pieces on an empty edge of a hexagonal cell on the board, e.g., a board of dimension N = 2:
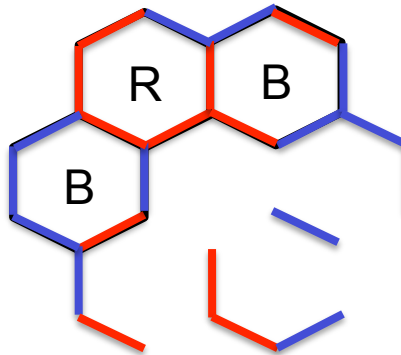
Objective of the Game

- The objective of each player is to capture as many hexagons as possible by connecting the adjacent dots on the board.

- The player that places the last piece and completes a hexagonal cell receives one point and an additional move.

- The game ends when there are no free cells left. The winner of the game is the player who has captured the most cells.

Win for red
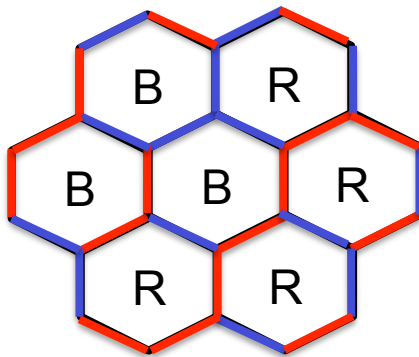
Win for blue
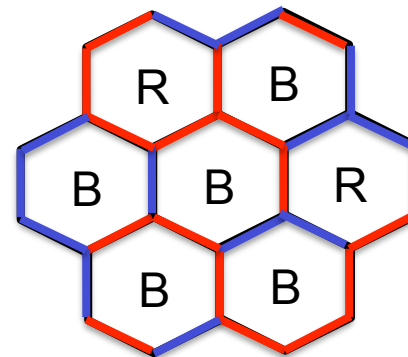
Challenges

- How to detect a winning board state?
- How do you know if you are close to a winning state?
- What is a good next move?
- How to balance attack vs defence?

- Question: How many moves can you look ahead on a board of dimension N = 3, assuming 1 Gbyte of memory?

Expectations

- Implement robust, efficient and well-structured code

- Include clear comments to document your code

- Try a creative solution to the problem

- Systematically evaluate several alternative approaches, and interpret the results

- Any software libraries or existing implementations that are used in part or full (or for inspiration) must be acknowledged in your code

Why games?

- Games are fun!
- Games are challenging for humans, and even more so for computer scientists
- Games test the limits of computers
- They provide an introduction to artificial intelligence