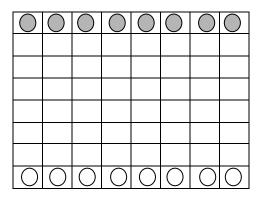Rattikorn Hewett
Feb 23, 2016

CS 5331 Concepts in AI and ML Systems

Project 1

Game Playing

You are to write a program that plays *squeeze-it*. Squeeze-it is a two-player board game in the northeast region of Thailand. The board is of size 8x8. Each play initially has eight pieces with an initial board configuration as shown below.

Rules of the game:

1. A player takes turn to move one of his pieces either horizontally or vertically. Each move can cross over any number of unoccupied squares to an unoccupied square.
2. Any player whose move completes a squeeze pattern (shown below) will result in the elimination of his opponent's pieces in the pattern.

Squeeze patterns:

(or same pattern in a vertical direction)   (or same pattern in a vertical direction)

Example:

Note: If white moves to complete a squeeze pattern then the two grey pieces will be eliminated.

Grey moves from other position (in a horizontal or a vertical direction) to complete a squeeze pattern

Whites are eliminated

3. A player wins a game when his opponent cannot make a move. In most cases, this is because all of the opponent's pieces have been blocked or eliminated.

This is a team project of two student members (except for special circumstances). Your program can be implemented in any programming language. Each team will compete in a tournament in class. No direct machine interface is required. For the purpose of the tournament, each program will be limited to make at most 50 moves and the team that has the most pieces left on the board wins.

What to submit
1. A well-documented source code
2. A brief report describing
    - the design of your program (components, modules, interfaces, etc.)
    - the heuristic evaluation functions
    - search strategies - limitation and features that make your program smart
3. Requirements and instructions for running your program (e.g., in a "readme" file).

Remarks: Take the report (part 2) seriously. It is important for your project scores. Although you have over a month to complete this assignment, start early since during the same period there will be other homework assigned in addition to this programming assignment.

Evaluation criteria
    - Correctness – if the program can play the game properly
    - Design – modularity and flexibility – is it easy to modify?
    - Documentation – both internally in a source code (part 1) and a report (part 2)
    - Performance - ranking from the tournament

Due date: Mar 8 in class.
Tournament Date: Mar 8 (in class). You will need a laptop to compete in the tournament.
Other Important Dates: Midterm March 10 (tentative), Spring break Mar 12-20.

A **TA** will manage the tournament and give a report of the results to me. Tasks include:
- Make decisions involved the tournament such as
    - Which pairs of teams to play against one another in each round of the tournament
    - Which team to start the move in each match
    - What to do when there is a draw (e.g., repeat the matches with a different starting team and continues until no draws)
- Monitor the tournament. Make sure that every team gets to compete fairly and organize an extra tournament time (out of class) if necessary
    - If the program crashes (because of carelessness) and the team manages to fix the bug within the tournament period, the team may be allowed to get back in the tournament at an appropriate round. The volunteer has an authority to decide.
    - Facilitate help on a team that does not have a laptop for the tournament (e.g., suggest the team to borrow from the department)
- Report results to me (in a spreadsheet file) showing
    - Ranking of the competition
    - Each program, report the following 1) if it crashes, or crashes but fixed later, or runs and complete the game, then 2) report how many times it wins and loses and 3) any observation on intelligent plays by the program.