ASSIGNMENT 3

Implementing AI agents for two player games

In this assignment you will implement an Alpha-Beta pruning based agent to play different two player games. Alpha beta pruning is a kind of adversarial search. For details on adversarial searchand alpha beta pruning refer to 5.1 – 5.4 of your text book and the provided material.

As the games you will be solving have very large depths and you will need to truncate the search at a reasonable depth and use a heuristic to evaluate the non-terminal state. The heuristic will estimate the utility value of the state. Details can be found in 5.4.1-5.4.2.

There can be found some variations of the Alpha-Beta pruning algorithm. You must implement the one outlined in Figure 5.7 of your text book and limit your search to a fixed depth. You can refer to "pseudo.txt" for a simple pseudocode.

Tasks

You need to implement a human agent and an Alpha-Beta pruning agent with depth limit to play two player games as follows:

Subgroup	Game
A1, B1	Mancala
A2, B2	Four in a row

You **must** use the provided Java framework and extend the needed classes to complete the tasks. Specifically you will need to extend two abstract class Agent and Java. The implementation details can be found in the java files. Check that no evaluation/heuristic function is specified here. You will have to come up with it. You can take help from internet regarding this. Also, you will have to test your algorithm with different depths to find a value that gives calculates a "good" move in a "reasonable" amount of time.

You **must** implement GUI for this assignment.

Marks Distribution

Category	Percentage
Implementation of Alpha-Beta pruning and the game	30%
Heuristic Function	30%
GUI	20%
Overall program and understanding of the algorithm	20%

Reference

Online Game Links:

http://www.mathplayground.com/mancala.html
http://www.mathplayground.com/connect4.html
https://www.mathsisfun.com/games/reversi.html

Rules:

https://www.hackerrank.com/challenges/mancala6