Theory of Computer Games(Full 2022)

Final Project

National Taiwan University

Due Data:

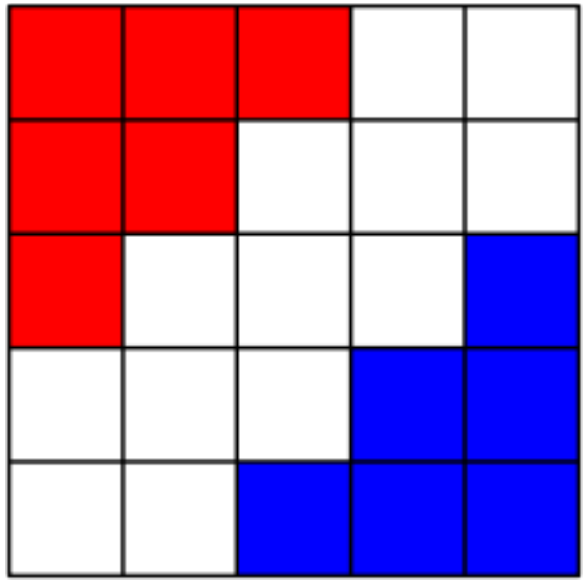
Homework Description

In this homework, you are required to

- Implement an agent of **Einstein Würfelt Nicht** using NegaScort
- Participate the 16th NTU CSIE CUP of Computer games competition

Einstein Würfelt Nicht

- get one of their cubes to the far corner square in the grid
- or remove all of their opponent's cubes from the board
- more detail can see wiki



Homework requirement

- You’re required to implement following:
  - NegaScout
  - Time Control
  - Transportation Table
  - Design of a evaluation function using various knowledge heuristic
  - Iterative deepening Aspiration search
  - Star1, Star2 or Start2.5
- Beat the random baseline
- Write a Report

Competition

- Date (Tentative)
  - 2022 12/29 14:20 (UTC+8)
  - 2023 1/5 14:20 (UTC+8)
  - Players are expected to prepare for the tournament between 1pm and 2pm.
  - Late comers will be treated as no show.
- Game Setting
  - Tournament format: Swiss-system
  - Round: >= 4 round *2
  - Time limit: 240 second each game
  - You lose if your program crash 2 times in a game.
  - In case of any violation, the referee has the right to decide the result of a game or if it may be restarted.
  - No appeal against the decision of the referee is allowed.

Swiss System:

- Players are never eliminated
- In every round, a player is paired against an opponent who has the same or similar points.
- Each round consists of 6 games with alternating first player.
- You can get S, $S \in \{0, 0.5, 1\}$ points for each game.
  - Win: 1 point
  - Draw: 0.5 point
  - Lose: 0 point

Report

- Your report should include but not limit to the following:
  - How to compile your code into an agent
  - What algorithms and heuristics you've implemented
  - Experiment results and findings of your implementation
  - Some detail about your implementation
  - Discuss benefits of various enhancements
- Add your name and student id in the report

Submission and Grading Policy

- Directory Hierarchy:
  - Student_id
    - Makefile
    - src // a folder contains all your code
    - report.pdf
- Compress your folder into a zip file and submit to https://www.csie.ntu.edu.tw/~tcg/2022/final.php
- Due to server limitation, the file size is restricted to 2MB.

Grading policy

- Final score = 100 % + Bonus
- Beat the random baseline: 20
- Coding score: 50
- Report: 30
- Bonus:
  - depends on the tournament performance.
  - Star 2: + 2.5
  - Star 2.5: + 5
  - Forward pruning: +5
  - History heuristic: +5

More detail

- You can get more detail about competition environment and template code on the website
- https://www.csie.ntu.edu.tw/~tcg/2022/final.php