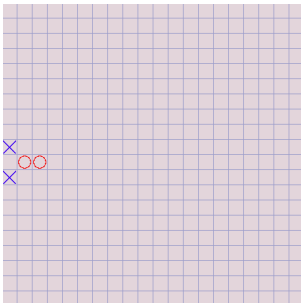
DATA130008 2020 Fall: Final Project
Gomoku

Submitting

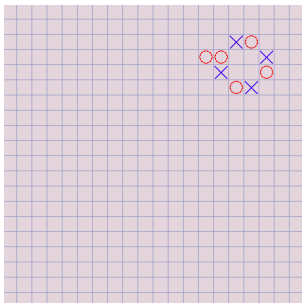
- Server address: ftp://10.192.7.236/
- Midterm:
  - Implement **Minimax with Alpha-Beta Pruning** in your agent.
  - Due: **December 9th, 2020**
- Final
  - Implement **MCTS** and improve your agents.
  - Due: **January 19th, 2020**
- Programming language: Python3 (No marks for other language)
- Uploaded file: No more than 20 MB space and named as id.zip
- **No marks for plagiarism!**

Gomoku Rule

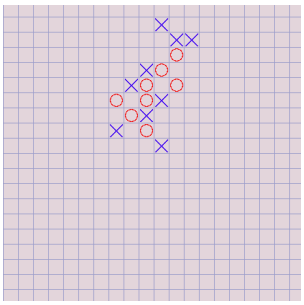
- Chessboard: 20×20 grid intersections.
- Free-style Gomuku: A row of five or more stones for a win.
- Openings: The competition should be started with three openings. The opening file can be downloaded from E-Learning.



Opening1



Opening2



Opening3

AI Agents

We will provide 12 agents for competition, including:

YIXIN17	WINE17	PELA17	ZETOR17	EULRING	SPARKLE
NOESIS	PISQ7	PUREROCKY	VALKYRIE	FIVEROW	MUSHROOM

And 12 matches will be conducted for you with each agent.

- Command line for Combat with AI agents:

  piskvork.exe -p xxx.exe FIVEROW.zip -opening 1 -rule 0 -memory 512 -timeturn 15000 -timematch 90

Grading

- Midterm(30%)
  - Report(70%): No more than 6 pages;
  - Baseline(30%): Full marks if the rating of your AI agent (Minimax with Pruning) is higher than the rating of MUSHROOM;
- Final(70%)
  - Report(50%): No more than 6 pages;
  - Baseline(15%): Implement the MCTS. You need to describe the details and results of your MCTS in the report.

- Rating(35%): (your final rating - lowest rating)/(highest rating - lowest rating).
  - All ratings are calculated using Bayesian Elo with eloAdvantage = 0, eloDraw = 0.01, and default prior.
  - Latest Ratings can be found here! (http://www.sdspeople.fudan.edu.cn/zywei/DATA130008/ranking.txt)

Grouping

- The group consisting of no more than **two** people is encouraged, otherwise we will take **10%** off each student's grade in this group.
- Include names and IDs of **all** members in your group in the **report**.

Websites

- Gomocup: http://gomocup.org/
- Gomoku AI: http://gomocup.org/download-gomoku-ai/
- Gomoku manager: http://gomocup.org/download-gomocup-manager/
- Python Template: https://github.com/stranskyjan/pbrain-pyrandom

References

(1) Go-moku and threat-space search(1993), Louis Victor Allis and Hj Van Den Herik.

(2) Searching for Solutions in Games and Artificial Intelligence(1994), Louis Victor Allis.

(3) Go-Moku Solved By New Search Techniques(1996), Louis Victor Allis, H. Jaap van den Herik, and M. P. H. Huntjens.

(4) Self-teaching adaptive dynamic programming for Gomoku(2012), Dongbin Zhao, Zhen Zhang, and Yujie Dai.

(5) Evolving Gomoku Solver by Genetic Algorithm(2014), Junru Wang and Lan Huang.

(6) Effective Monte-Carlo tree search strategies for Gomoku AI(2016), J H Kang and H J Kim.

(7) ADP with MCTS algorithm for Gomoku(2016), Zhentao Tang, Dongbin Zhao, Kun Shao, and Le Lv.

For more inforamtion, please check slide of lab2. If you have any questions, please contact:

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- He, Xiaofeng, 20210980125@fudan.edu.cn, for rules and grades.