AI-Gomoku-Project-1-Report

Project Name: GomoKu AI

Github Repository Link: https://github.com/SifatSikder/Gomuko-AI-Project-1

Developers:

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Technology Used: Angular,Nodejs

Features:

- Connect 5 board game
- Choosing Player order
- Restart the game

Game Mechanics:

➔ Base algorithm used for AI: Minimax

➔ Alpha-Beta Pruning is used to minimize the game tree.

➔ Heuristic Method:

The number of discs a player has in a winning pattern is a heuristic to estimate his chances of winning by completing that particular pattern (given that there is no opposing disc in that particular pattern).

➔ Evaluation Function:

- If there is any 5 in a row then the score will be `200000000(highscore)`
- `If there is a 4 in a Row then If`
  - `There is 2 open ends then`
    - `If there is currentPlayer turn then score=100000000 else score=500000`
  - `There is 1 open end then`
    - `If there is currentPlayer turn then score=100000000 else score=50`
- `If there is a 3 in a Row then If`
  - `There is 2 open ends then`
    - `If there is currentPlayer turn then`

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                score=10000 else score=50
        ○ There is 1 open end then
            ■ If there is currentPlayer turn then score=7
              else score=5
- If there is a 2 in a Row then If
    ○ There is 2 open ends then score=5
    ○ There is 1 open ends then score=2
- If there is a 1 in a Row then If
    ○ There is 2 open ends then score=1
    ○ There is 1 open end then score=0.5
```

➔ Cutting off search is done at game tree depth = 3

➔ Additional Logic:

- ◆ In cases where human can win with a single move, AI will block that move without making the game tree.
- ◆ In cases where AI can win with a single move, AI will make that move without making the game tree.