E03 Othello Game

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Task

Problem

Othello (or Reversi) is a strategy board game for two players, played on an 6×6 uncheckered board.

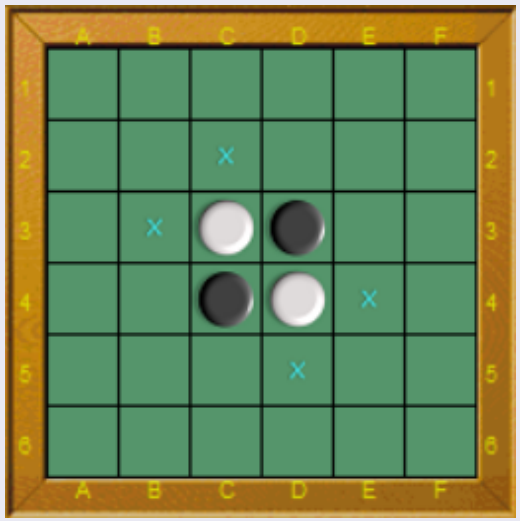

Figure 1: Othello Game

Task

Problem

During a play, any disks of the opponent's color that are in a straight line and bounded by the disk just placed and another disk of the current player's color are turned over to the current player's color.

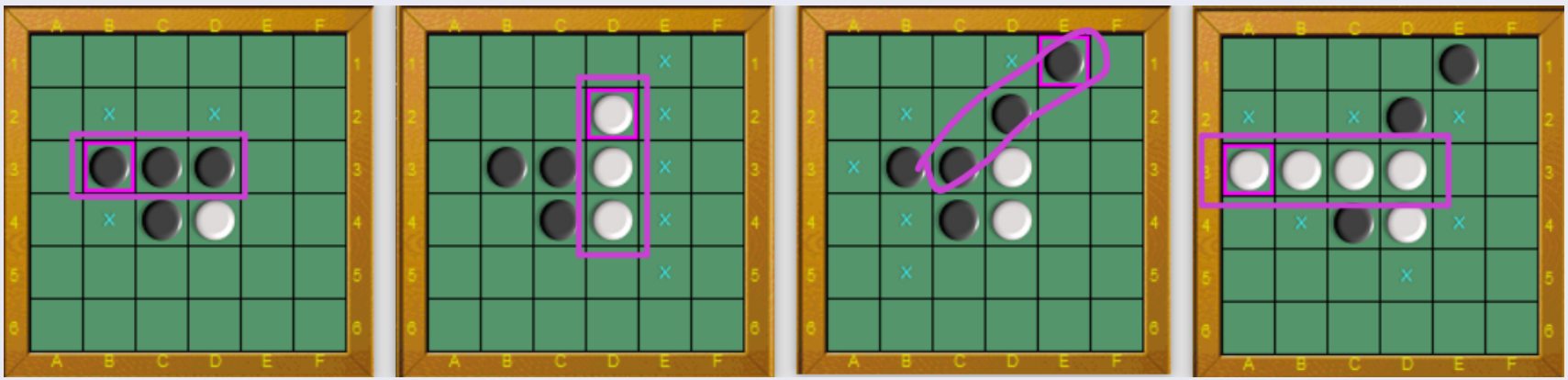

Figure 2: Take a turn

Task

Description

- Choose an appropriate evaluation function and use min-max and $\alpha - \beta$ prunning to implement the Othello game. The framework file you can refer to is Othello.cpp.
- I wish you to compare the performance of different heuristic evaluation functions (by comparing chess skills of different agents).
- Further more, you are also encouraged to compare the efficiency of minimax and $\alpha - \beta$ prunning algorithm.
- There are several evaluation functions that involve many aspects, you can turn to http://www.cs.cornell.edu/ yuli/othello/othello.html for help.

Solution

The $\alpha - \beta$ pruning algorithm that will be used in this exercise is in line 59:

```
58  //最大最小博弈与α -β 剪枝
59  Do * Find(Othello *board, enum Option player, int step, int min, int max, Do *choice)
60  {
61      int i, j, k, num;
62      Do *allChoices;
63      choice->score = -MAX;
64      choice->pos.first = -1;
65      choice->pos.second = -1;
```

We already provide a naive evaluation function in Othello.cpp, which should be exceeded by better ones.

```
604 int Othello::Judge(Othello *board, enum Option player)
605 {
606     int value = 0;
607     int i, j;
608     Stable(board);
609     for (i = 0; i<6; i++)
610     {
611         for (j = 0; j<6; j++)
612         {
613             value += (board->cell[i][j].color)*(board->cell[i][j].stable);
614         }
615     }
616
```

Submission

pack your report `E03_YourNumber.pdf` and source code into zip file `E03_YourNumber.zip`, then send it to `ai_course2021@163.com`.

The End