Code Warriors

Problem Statement

Event Coordinators:

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Event Description:

CodeWarrior is CyberQuest's flagship Artificial Intelligence Challenge. It's one of a kind challenge that will be held during Avishkar. There is only one problem statement in the challenge - the game for which you have to write a bot. You will be given a two-player game and you have to write a bot that will play that game against other bots. Your bot has to adhere to the rules of the game given in the problem statement and play against the other bot.

Teams will compete against each other in a knockout tournament which will be held during Avishkar. Each match in the tournament will have two rounds (This will ensure that every team gets equal opportunity to play the first move). The one who wins the most rounds will be the winner of the matches. The winning team will proceed further in the tournament whereas the losing team will be knocked out of the tournament.

Team Size: 2 members
One member must be from CS/IT
Cross year teams not allowed

Btech 2nd and 3rd year and MCA 2nd year can participate in the event

Camelot

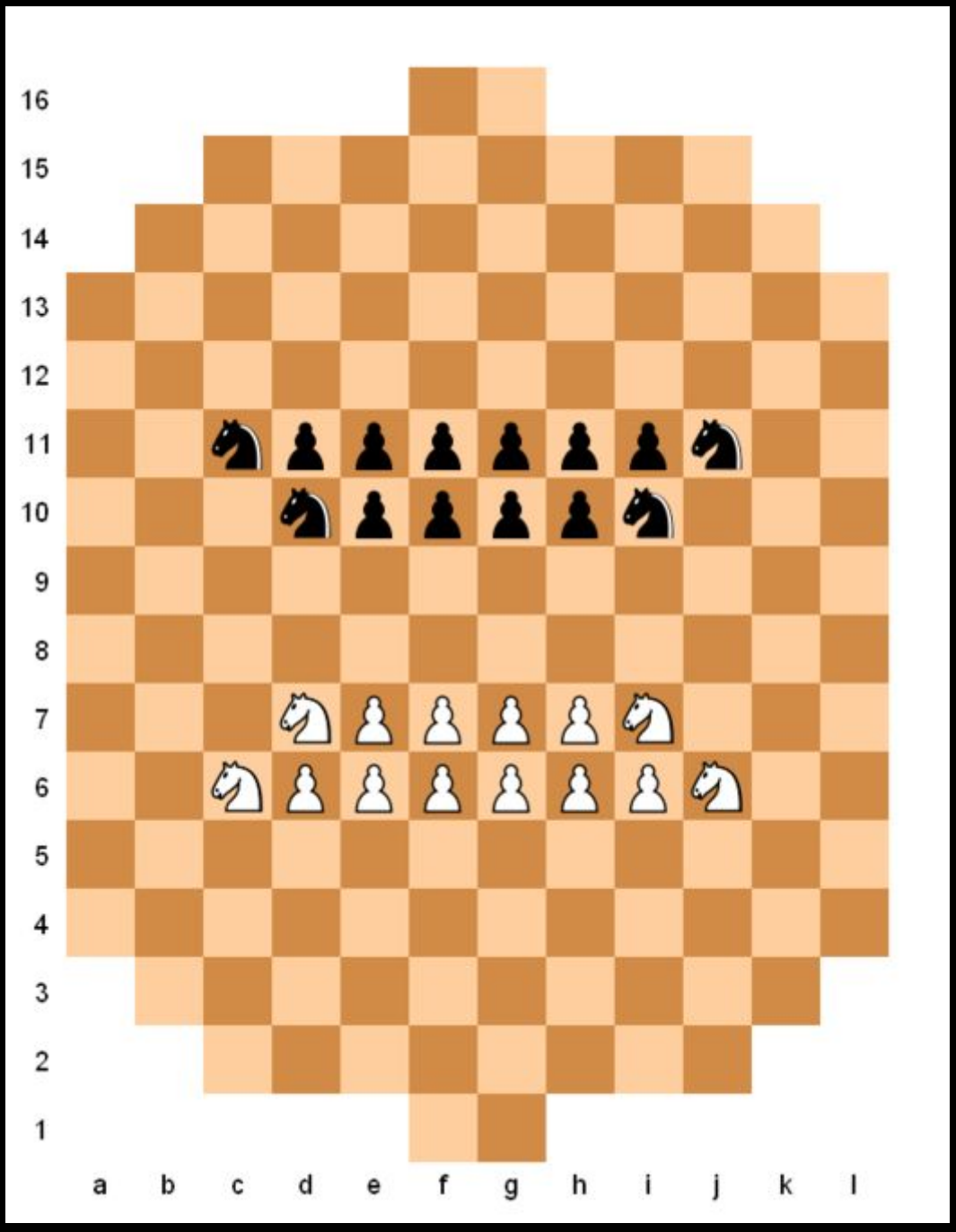


Figure 1

Camelot is a strategy board game for two players.

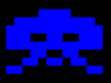
The game is played on a board of 160 squares, which is roughly rectangular (12×14), with three squares removed from each of the four corners, and four extra squares extending outside the main rectangle, two each at the top and bottom of the board.

So this year's game is similar to Camelot but has some modifications.

Terminologies

- A team has two types of players
    - Type 1 players aka Frontliners
    - Type 2 players aka Destroyers
- Each team has 10 Frontliners and 4 Destroyers.

 Green team's Frontliner

 Blue team's Frontliner

 Green team's Destroyer

 Blue team's Destroyer

- Position 1F, 1G is the base  of the Green team.
- Position 16F, 16G is the base  of the Blue team.
- Positions 1A, 2A, 3A, 1B, 2B, 1C, 1D, 1E, 1H, 1I, 1J, 1K, 2K, 1L, 2L, 3L, 14A, 15A, 16A, 15B, 16B, 16C, 16D, 16E, 16H, 16I, 16J, 15K, 16K, 14L, 15L, 16L are blocked positions and no player can move to these positions. So in the arena these positions are represented with asteroids.

 Asteroids

Game Rules

- The green team starts the game.
- Every player can move a single step in directions N, NE, E, SE, S, SW, W, NW.
- Every player can also jump over another player in direction N, NE, E, SE, S, SW, W, NW. The effect of this move is:
    - If a player jumps over a friendly player it doesn't affect the friendly player.
    - If a player jumps over an enemy player then it kills the enemy player.
- Destroyers can destroy themselves and will destroy other players that are in direction N, E, S, W of the destroyer. It doesn't matter if it's a friendly or enemy player. Destroyer kills anyone in those blocks.
- A player of each team can move to a position (aka cell) only five times. If this count reaches zero for a team then that team cannot move to that position anymore. If a destroyer destroys themself then it doesn't affect the number of moves at any position.

  For example: Initially, every position has 5 moves allowed at every position. If a green player moves from 6C to 7C then the number of moves at 7C that green players can move reduces by one (from 5 to 4). And if it moves from 7C to 8C then again to 7C then the number of moves that the green team is allowed to move at 7C cell reduces by one again (from 4 to 3).
- Moves defined at every cell are independent for each team, i.e. the number of moves allowed at a position for the green team is independent of the number of moves allowed at the same position for the blue team.
- If any player of a team cannot move then the team loses.
- If all the players of a team die then the team loses.
- If a team is able to capture both bases of the opposing team then the team wins.
- If all the players of both teams die then the game is declared as a draw.
- In the case of a Tie (when both teams win a match), the winner is declared as the team with:
    - more number alive players. If tie still remains then,
    - more number of Destroyers alive. If tie still remains then,
    - more number of kills. If tie still remains then,
    - less number of moves taken to defeat a bot written by event coordinators

- The move time limit for c/c++ is 1 second and Java is 2 seconds.

Input Format

The bot will be given with the following information before every turn:

1. An integer telling your team color
    a. 1 means Green team
    b. 2 means Blue team
2. A 16x12 matrix containing the board information.
    a. -1 means blocked position
    b. 0 means empty position
    c. 1 means Green's Frontliner
    d. 2 means Green's Destroyer
    e. 3 means Green's base
    f. 4 means Blue's Frontliner
    g. 5 means Blue's Destroyer
    h. 6 means Blue's base
3. A 16x12 matrix containing the moves allowed at a cell for your team
    a. =0 means you can not move to that position
    b. >0 means you can move to that position (and the number of moves for that position reduces by 1)
4. A 16x12 matrix containing the moves allowed at a cell for your opponent team
    a. =0 means your opponent can't move to that position
    b. >0 means your opponent can move to that position

Sample input

```
1
-1 -1 -1 -1 -1 3 3 -1 -1 -1 -1 -1
-1 -1 0 0 0 0 0 0 0 0 -1 -1
-1 0 0 0 0 0 0 0 0 0 0 -1
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 2 1 1 1 1 1 2 0 0
0 0 0 2 1 1 1 2 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 5 4 4 4 4 5 0 0 0
0 0 5 4 4 4 4 4 4 5 0 0
0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0
-1 0 0 0 0 0 0 0 0 0 0 -1
-1 -1 0 0 0 0 0 0 0 0 -1 -1
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5 5 5 5 5 5 5 5 5 5 5 5
0 5 5 5 5 5 5 5 5 5 5 0
0 0 5 5 5 5 5 5 5 5 0 0
0 0 0 0 0 5 5 0 0 0 0 0
```

Output Format

Output generated by the bot will be either in 3 lines or 5 lines. Each line contains an integer as follows:

1. An integer telling the type of move
    - 0 means plain move (Normal move from a player)
    - 1 means sacrifice move (Where destroyer destroys himself)
2. An integer telling initial x coordinate of a move(0 based)
3. An integer telling initial y coordinate of a move(0 based)
4. If it's a plane move, an integer telling final x coordinate of a move(0 based)
5. If it's a plane move, an integer telling final y coordinate of a move(0 based)

Note: Referring to figure1, "1A" is at 0th row, 0th column

Sample Output

For a plain move(0) by green player from 6C to 7C, i.e. from (5,2) to (6,2):

```
0
5
2
6
2
```

For a sacrifice move(1) by green's destroyer at 6C i.e (5,2):

```
1
5
2
```

Instructions For Running Arena:

1. Before running the arena please ensure that you have JRE (Java Runtime Environment) installed in your system.
2. Download the arena from https://cc-mnnit.github.io/2020-21-Classes/CodeWarrior/Arena.zip
3. Extract the zip file. It contains the arena's jar file.
4. Either open the jar file by double-clicking it or by the terminal (In case of windows open PowerShell) and run the command *java -jar arena.jar*

For doubts please contact any of the event coordinators (Refer 1st page).

Screenshots of Arena

Arena :P

Arena during a game