Introduction to AI Spring 2019 Group Game Project Spec

In the following are the rules of game with highlighted text indicating the changes:

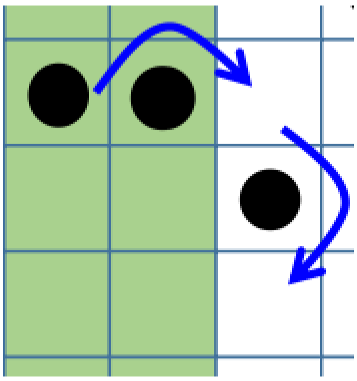
- Each player has 9 pieces initially, arranged as file provided before.
- Black moves first.
- The valid moves are:
  - Move one piece to an adjacent unoccupied square.
  - Have one piece hop over another piece of either player to an unoccupied square. Multiple hops by one piece can be taken within one move as long as all the hops are valid and form a sequence. **However, there is a maximum hop count equal to 99. Any move that includes more than 99(>99) hops is considered as invalid move.**
- When hopping over an opponent's piece, the opponent's piece is considered "captured" and removed from the board.
- The overall objective is to move as many of a player's pieces as possible to the shaded squares in the opposite side (the target region).
- A player's move is skipped if he/she makes an invalid move or has no piece remaining on the board. The other player will continue to play. **Skipping will also happen when all pieces of a player don't have any valid move or your program exceeds the time limit(5 second)**.
- The game ends when
  - Either players have all his/her pieces on the board in the target region, or
  - A maximum of 200 moves per player has been played.
- At the end, the score of a player is the number of pieces placed in the target region. The player with the higher score wins the game.

The tournament rules are exactly the same as mentioned before.

About programming:

You are allowed to use Python(3 or above)/C++ 14(or below) to code your program. TAs will provide code including TCP socket and a basic code template. For simplicity, you only need to fill in the function provided in template code. Of course you can skip the code provided and go on your own. But be careful that **any invalid transfers or hostile actions executed by your program will be recorded and you will be punished and will lose the game** in such case. Following are some descriptions about coding:

- General
  - You don't need to worry about the connection between your program and the tournament judge if you follow the template code. The template code provides a function **`GetStep`** for you to fill in. It has two parameters (**`board`**, **`is_black`**) and the returned object contains the current move made by you program.
  - Function **`GetStep`** will be called only when it's your turn (no matter whether you are playing as Black or White).
  - Parameter **`board`** contains the current game board status which is stored in list-of-list (python) and vector-of-vector (c++); **`board[i][j]`** indicates the status of square at the ith row and jth column of the board: **0**: unoccupied; **1**: occupied by Black; **2**: occupied by White. Both i and j are zero-based ($0 \le i, j \le 7$).
  - Parameter **`is_black`** (Boolean type) is true if you are playing as Black and false if you are playing as White.
  - You should return information about your move made in **`GetStep`** as a list-of-list (python) or vector-of-vector (c++). Let the variable **`steps`** be your returned value; **`steps = [(r0,c0), (r1,c1), …]`**. The first pair **`(r0,c0)`** is the initial position (row, column) of the piece to be moved. See example image to the right: Assuming that the initial position is **`(1,0)`**, this move is recorded as **`[(1,0), (1,2), (3,2)]`**.



  - Remember not to mess up the global variables used in the provided code (**`STcpClient.py`**/**`STcpClient.h`**).
- Python

  - **`STcpClient.py`** : This code includes TCP functions. you should not change it except that you must change the number at line 11 "**`idTeam = -1`**" into your team number "**`idTeam = <team_number>`**". We will announce the team number after 5/10.
  - **`Sample.py`**: This is template code which includes function **`GetStep`** to be filled by you.
  - We will run your code in python 3.6 or above with win10 operating system. Your source code should be able to run directly by python interpreter.
- C++
  - **`STcpClient.h`**: This code includes TCP functions. you should not change it except that you must change the number at line 11 "**`idTeam = -1`**" into your team number "**`idTeam = <team_number>`**". We will announce the team number after 5/10.
  - **`Sample.cpp`**: This is template code which includes function **`GetStep`** to be filled by you.
  - Notice that template code are written in Visual Studio 2017 with win10 operating system and includes os-depended code (winsock for TCP) and compiler-depended code (**`#pragma`**). Both compiler and operating system can be found on https://ca.nctu.edu.tw/. You can escape compiler dependency by replacing "**`#pragma once`**" with other duplicate include guard and replacing "**`#pragma comment(lib,"Ws2_32.lib")`**" with other static library link method. But remember to remove these changes when you submit the source code because we will compile your code with Visual Studio 2017.
  - We will run your code in win10 operating system. DO NOT submit the whole project directory. Instead, just submit **`STcpClient.h`** and **`Sample.cpp`** if you use the template code.

TAs strongly recommend you to use the same compiler and operating system as mentioned above to ensure there won't be any unexpected problems.