# Final Project Description

December 25, 2014
Last modified Jaunary 16, 2015

# Announcement and Important Data

- Competition date: 2015/01/22 09:30-16:30 at CSIE 204.
- Rules:
  http://www.iis.sinica.edu.tw/ tshsu/tcg/2014/hwks/rules.pdf
- Submit page: http://w.csie.org/ tcg/2014/final.php
  - Submission due data: 2015/01/23 09:00
- Download link for final project files:
  - http://w.csie.org/ tcg/tcg_2014_final_project.zip
  - Check your school e-mail address for password.

# Brief Rules for Final Project

- 瑞士制
  - 預估六至八輪。
  - 一個對戰組合互先一次。
- 請提前到場抽籤決定第一輪對手。
- 單場限時 900秒
  - 超時算敗

# Files and Description

- Template code folder
  - final_project_template (Provide by TA, used in class only)
- GUI interface folder:
  - DarkChess_win7
  - DarkChess_Ubuntu
- 暗棋對弈平台_使用手冊_win7_201412231830.pdf
- 暗棋對弈平台_使用手冊_ubuntu_201412231830.pdf

# GUI Mode and Protocal Type

- 單機模式: 透過 Board.txt, Move.txt
  - Human v.s. Human
  - Human v.s. Computer (Computer play as second player)
  - Computer v.s. Human (Computer play as first player)
- 連線模式: 透過 Socket
  - Computer v.s. Computer

# High Level Flow Chart of Protocol: 單機模式

- Initial the game state according to board.txt
- Generate a move
- Write the move to move.txt

# High Level Flow Chart of Protocol: 連線模式

- Initial the socket connection
- Initial the game state through the socket
- While(true)
  - If it's your turn
    - Generate a move and send it through the socket
    - Update the local game state
    - Receive the message from the server
    - Change the turn
  - If it's opponent's turn
    - Wait for opponents' move
    - Receiving Opponent's move and update the game state.
    - Change the turn

# Template Code

- File
  - main.cc
  - anqi.cc
  - anqi.h
  - Protocol.h
  - Protocol.cpp
  - ClientSocket.h
  - ClientSocket.cpp
- Need -static -s when compiling in all system
- Need -lwsock32 when compiling in windows system
  - Can use -D _WINDOWS to anable extra WINDOWS only feature.

# Main Function

```
BOARD B;
TimeOut=(B.LoadGame("board.txt")-3)*1000;
if(!B.ChkLose())Output(Play(B))
```

# Function Play

```
MOV Play(const BOARD &B) {
POS p; int c=0;
// 新遊戲？隨機翻子
if(B.who==-1){p=rand()%32;return MOV(p,p);}
// 若搜出來的結果會比現在好就用搜出來的走法
if(SearchMax(B,0,2)>Eval(B))return BestMove;
// 否則隨便翻一個地方 但小心可能已經沒地方翻了
for(p=0;p<32;p++)if(B.fin[p]==FIN_X)c++;
if(c==0)return BestMove;
c=rand()%c;
for(p=0;p<32;p++)if(B.fin[p]==FIN_X&&-c<0)break;
return MOV(p,p);
}
```

# Function SearchMax

```
SCORE SearchMax(const BOARD &B,int dep,int cut) {
if(B.ChkLose())return -WIN;
MOVLST lst;
if(cut==0||TimesUp()||B.MoveGen(lst)==0)return +Eval(B);
SCORE ret=-INF;
for(int i=0;i<lst.num;i++)
BOARD N(B);
N.Move(lst.mov[i]);
const SCORE tmp=SearchMin(N,dep+1,cut-1);
if(tmp>ret){ret=tmp;if(dep==0)BestMove=lst.mov[i]
}
return ret;
}
```

# Board Index

Template-Code

| | | | |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 |

Protocal

| | | | |
|---|---|---|---|
| 28 | 29 | 30 | 31 |
| 24 | 25 | 26 | 27 |
| 20 | 21 | 22 | 23 |
| 16 | 17 | 18 | 19 |
| 12 | 13 | 14 | 15 |
| 8 | 9 | 10 | 11 |
| 4 | 5 | 6 | 7 |
| 0 | 1 | 2 | 3 |

Protocal-(x,y)

| | | | |
|---|---|---|---|
| (0,7) | (1,7) | (2,7) | (3,7) |
| (0,6) | (1,6) | (2,6) | (3,6) |
| (0,5) | (1,5) | (2,5) | (3,5) |
| (0,4) | (1,4) | (2,4) | (3,4) |
| (0,3) | (1,3) | (2,3) | (3,3) |
| (0,2) | (1,2) | (2,2) | (3,2) |
| (0,1) | (1,1) | (2,1) | (3,1) |
| (0,1) | (1,1) | (2,1) | (3,1) |

# Frequency Asked Questions

- For MAC:
  - Q: Is there a GUI version for MAC?
  - A: Currently there is no MAC version.
- For Linux
  - Q: What does permission denied means?
  - A: Your "search" file needs to be executable.
  - Q: Why my GUI interface does not work?
  - A: Make sure to add the LD_LIBRARY_PATH=. to include the GameDLL.so
- For Windows
  - Q: When using "背景" mod, the GUI just hanging there?
  - A: In some combinations of Windows OS and compiler, the number arguments passing by the commnd line is not implemented by the stander. Check the value of argc, if it's not 3, then in Line 167 of main.cc
    protocol→init_protocol(argv[1],atoi(argv[2]));
    should be changed to
    protocol→init_protocol(argv[0],atoi(argv[1]));

# Unfrequency Asked Qustions

- A: What's the difference bettwen "背景" and "讀檔"
- Q: In "讀檔" mode, GUI called search engine for every single move. That is, the search program is terminated once it returned the move. In "背景" mode, the search engine is called in the beginning of the game, and it will be terminated only when the game is over.
- A: What if I want to compare the search engine for two different version?
- Q; You need to create another folder contains the GUI interface. Use one GUI interface to create the game room, and use the other to join the game room.