Project 2 Gomoku---Save the world

The name of game: The Gomoku v1.0

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Game Story:

      Do you still remember the Brain Smashing game(project1)? After this previous brain ruining game, the computer found out there is not enough power to destroy all the humans' brains.
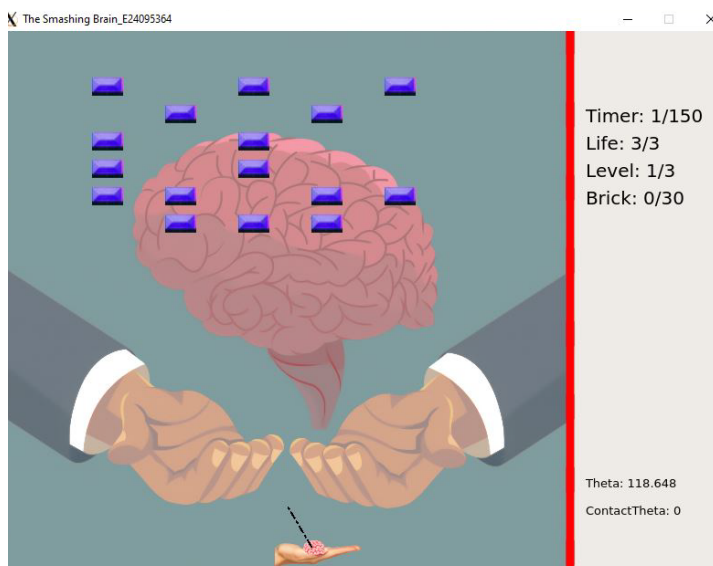
      Today the computer, the evilest creature on the Earth, has improved and became a really cunning powerful Demon -- the Artificial Intelligence(AI).

      It brings an ancient famous game the Gomoku to human beings! The Demon declared that it is gonna ruin humans' culture and happy life with its intelligence.
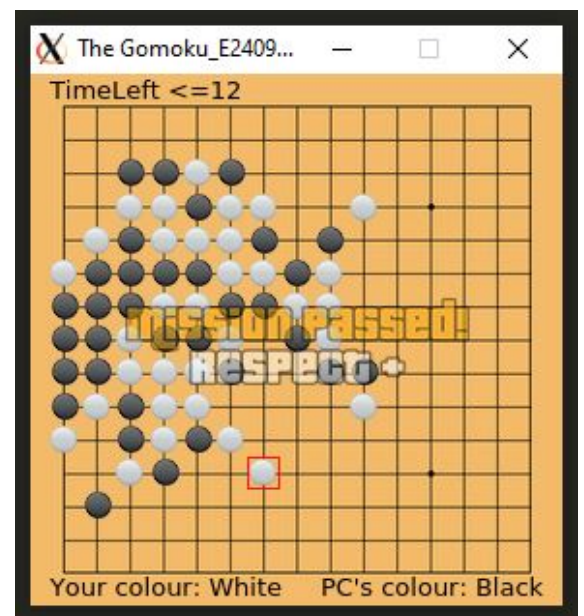
      And you! You are the last hope and the human Savior! I want you for the human army and save all of us from the evil Artificial Intelligence!

      God bless you, good luck ~~
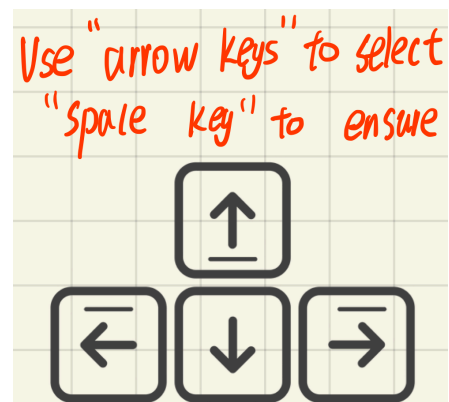
The Demon incantation: GoMoKuKuMoGoMoKu !!!!!!

➢ Implement Specification in Detail

All the graph design and operations are base on QT5 and C++ in Cygwin.

In program, every type of object is a class. So, it can let you easily recreate the same type of objects as many as you like.
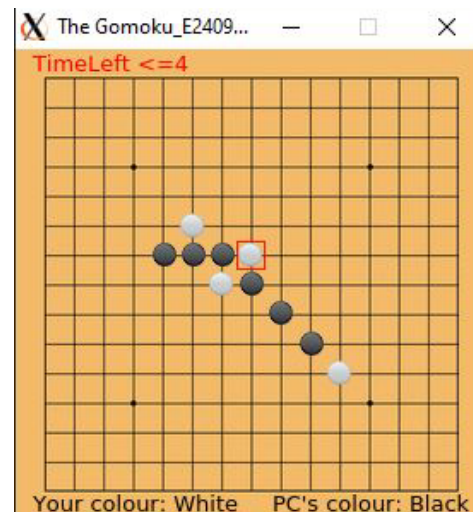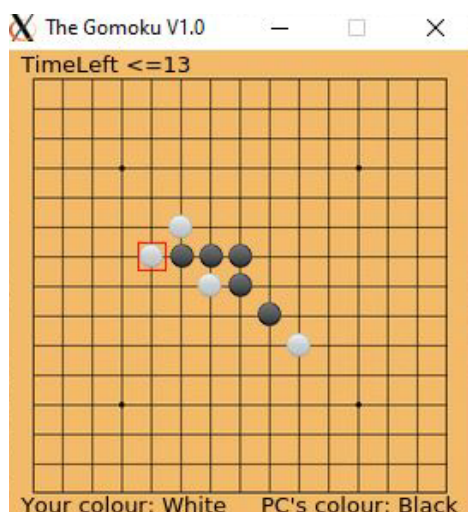
1. Choose your colour

In the menu page, you can choose black or white chess as your weapon to battle with computer. Kindly mention that black is always the first chess.

2. Mind your time left

During the game, you have 15 seconds for each turn. If you can't make your decision in 15 seconds, it will pass to computer to chess. The timer will change to red when it is less than 5 seconds. Overall, mind your time and try your best!
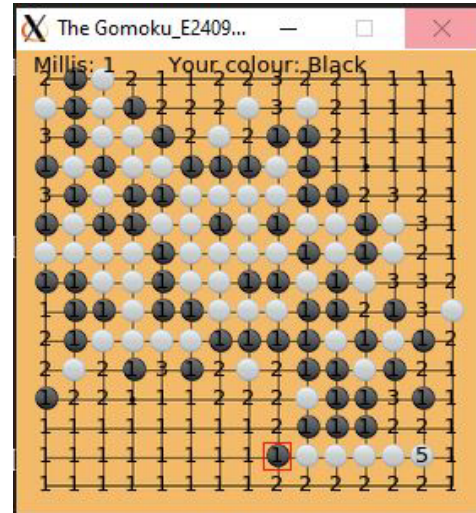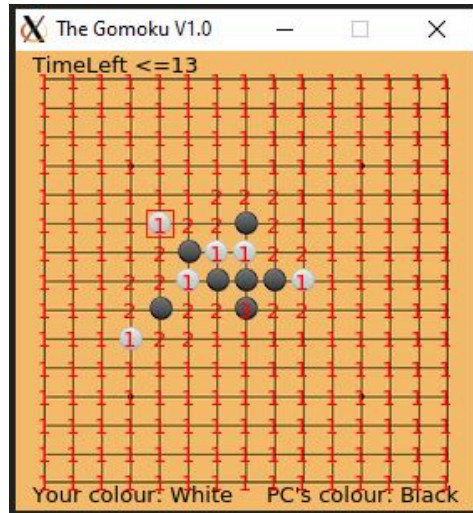
3. Fabulous Artificial Intelligence

You may(must) find out the computer is so strong and good at this game. It is because it has a clever algorithm to make decision.
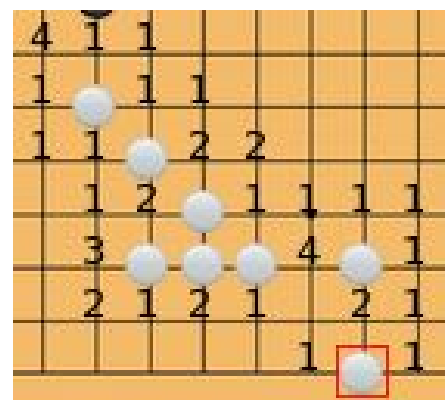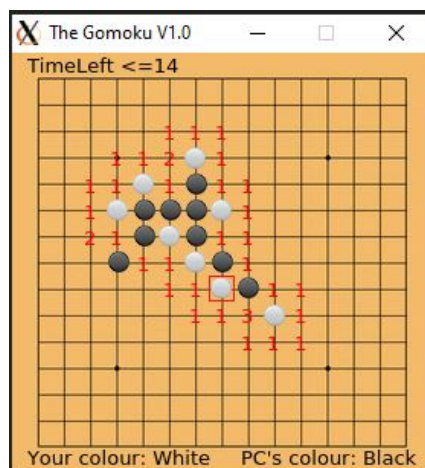
- Make a connected chess map of computer (Prior map)

Computer will make a connected chess map in the real time, which is covered all the 15x15 chess board. So, computer can know how to chess and maximize the probability to win. *(cheatMode=2)*

- Make a connected chess map of human (Less prior map)

However, computer also need to protect itself and block human to win. So, computer need to make a similar connected chess mass of human, and determine whether need to block human chess. *(cheatMode=3)*
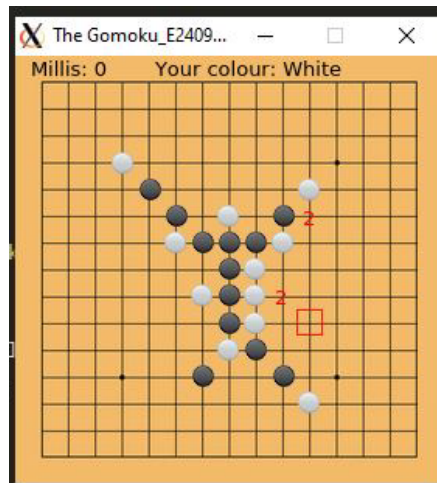

Therefore, by combining and comparing these two maps together. Computer can make a great decision to maximize the probability of win. But there is still some flaws in this algorithm. Such as it can't think further as human can, and it just calculate every position.
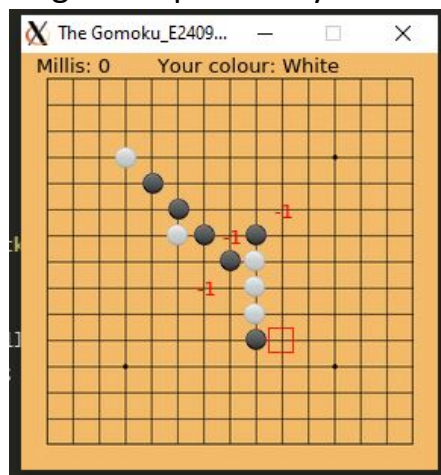
4. Tips mode for human

The computer can make a good decision by the two maps has mentioned before. Also, the computer has a mercy heart, and is able to give you some tips to defeat it. You can set 'cheatMode' into 1 in the 19th line of 'window_Gomoku.h' to access the righteous power from God.
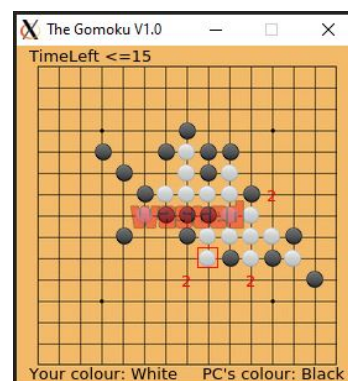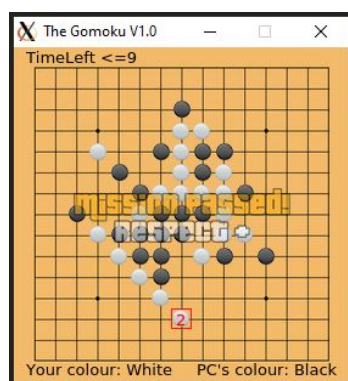
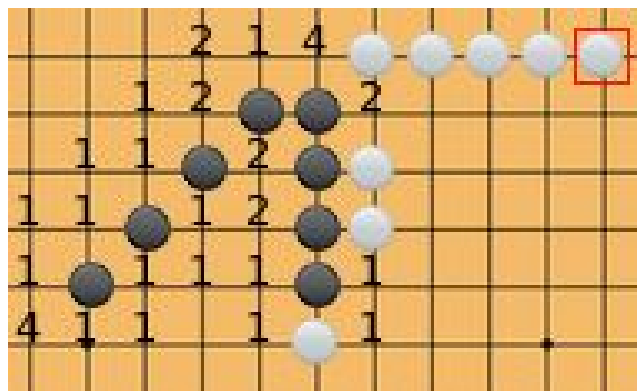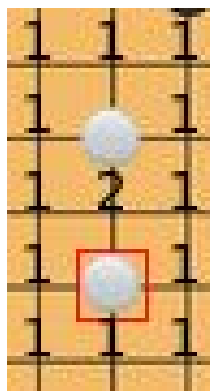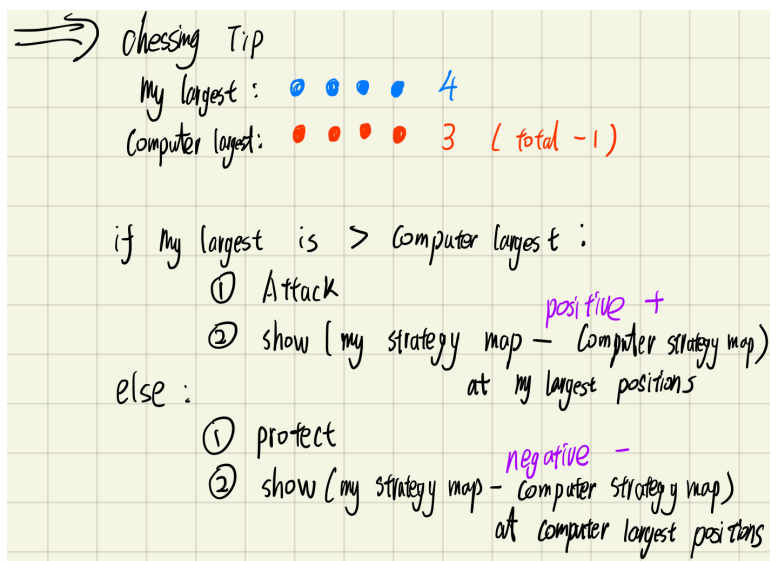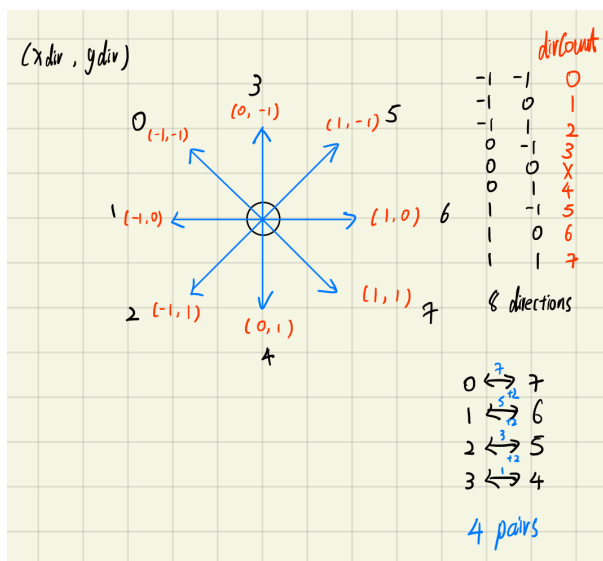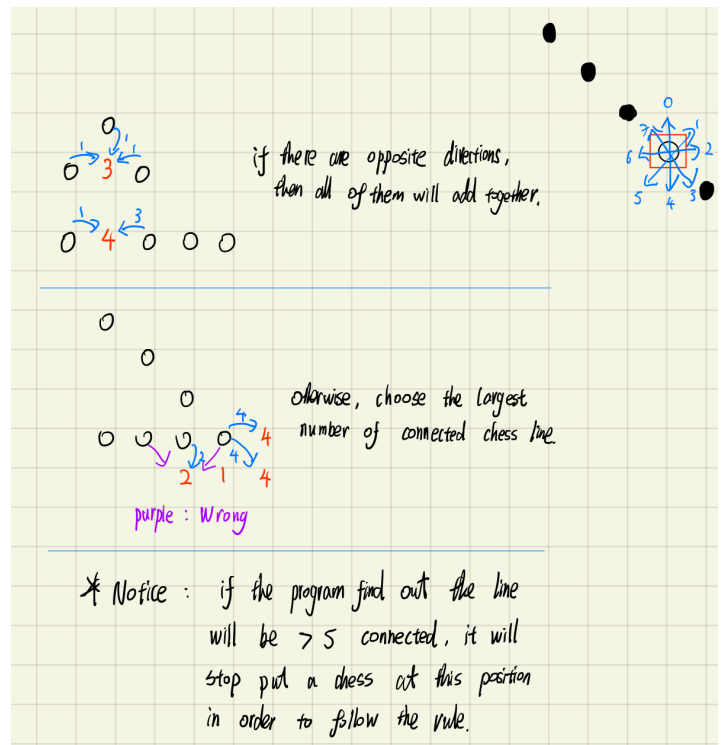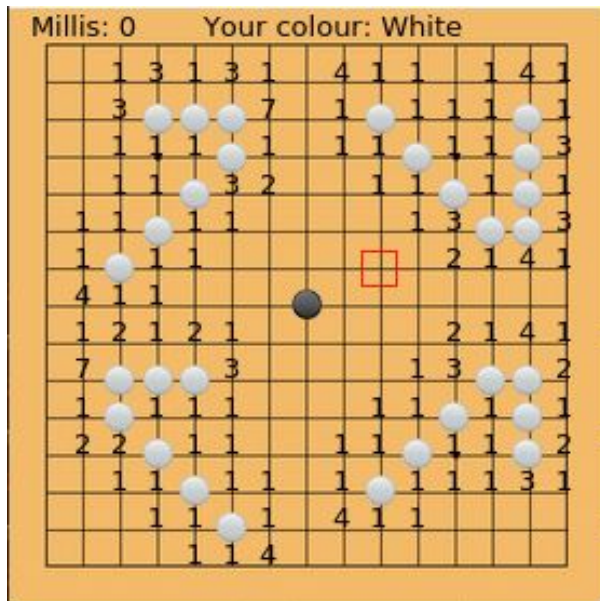- Positive tips mean you can attack the computer for prior

- Negative tips mean you need to protect yourself for prior

However, these tips just can help you, but not promising you can win. You may lose even with tip mode if you are not smart enough LOL.

➢ Drafts of brain storm for thinking the algorithm.

Millis: 0   Your colour: White

if there are opposite directions,
then all of them will add together.

otherwise, choose the largest
number of connected chess line

purple : Wrong

* Notice : if the program find out the line
will be > 5 connected, it will
stop put a chess at this position
in order to follow the rule.

(x dir , y dir)

dircount

8 directions

4 pairs

Chessing Tip
My largest : ● ● ● ● 4
Computer largest: ● ● ● ● 3 (total -1)

if My largest is > Computer largest :
  ① Attack
  ② show (my strategy map − Computer strategy map)   positive +
      at my largest positions
else :
  ① protect
  ② show (my strategy map − Computer strategy map)   negative −
      at computer largest positions

➢ Things to improve
1. Make the size of the chess board infinity.
2. Improve the AI program to analyze further cases
3. Connect to a sever and play online with other people
➢ Testing video:
NormalMode: https://photos.app.goo.gl/gnxkvM88Gcc3Y2RF7
TipsMode: https://photos.app.goo.gl/wg8PBas9e7QrasjP7