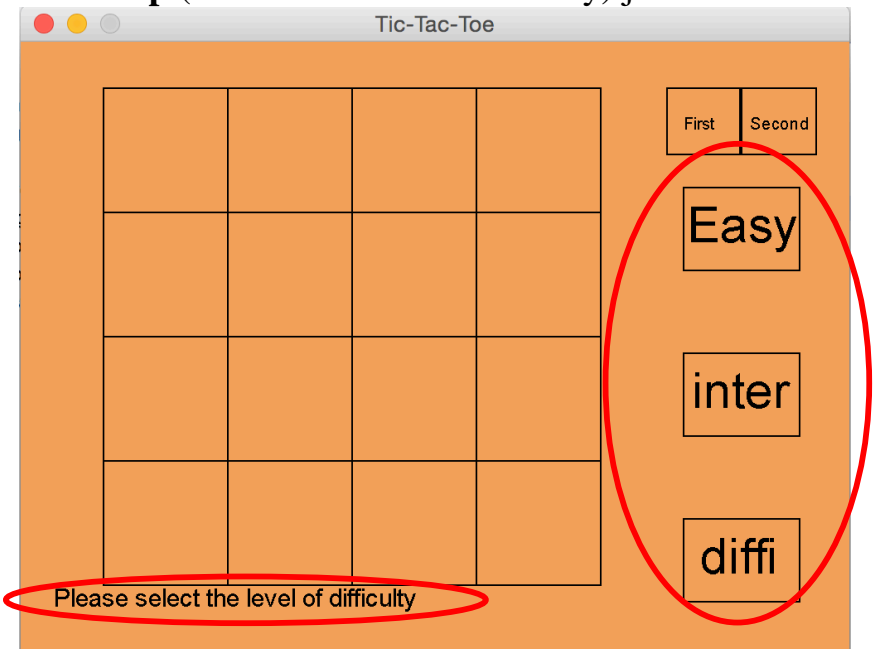
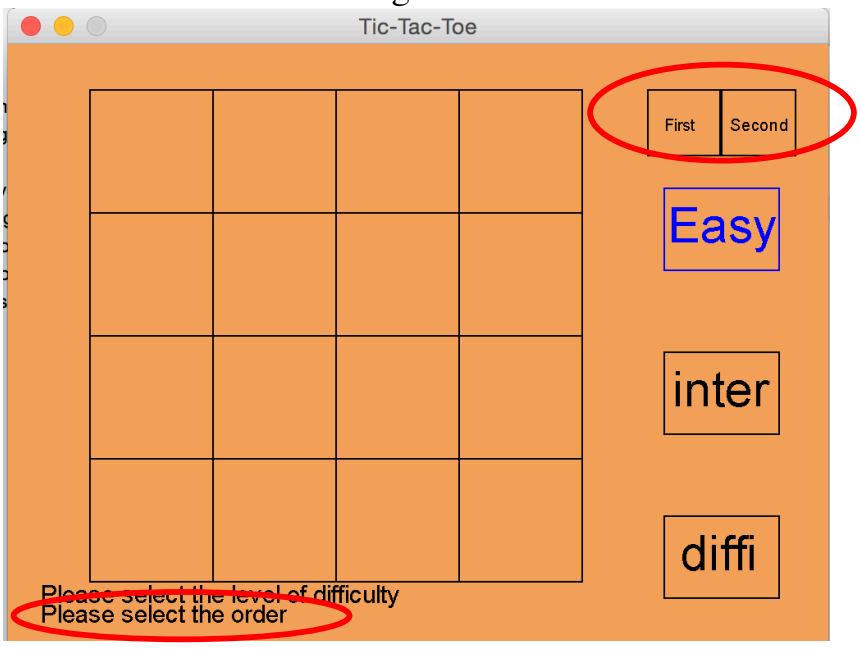
How to compile and run (two methods):
1. double click the executable code game.jar

game.jar

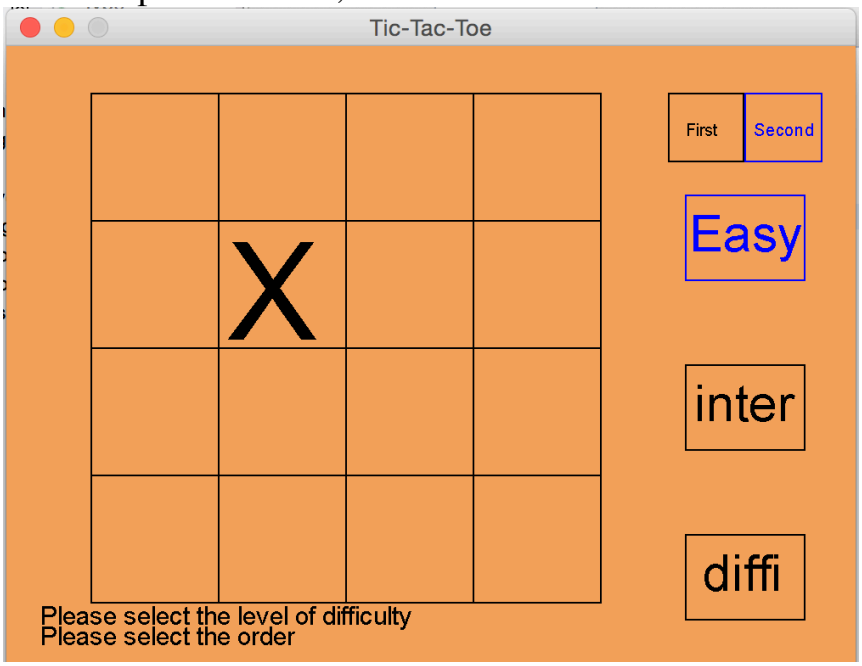
Or:
2.
Use Eclipse to compile and run the code.
There are three source code: play.java, search.java and display.java.
Run the play.java.
First step (select the level of difficulty) just shows as below:



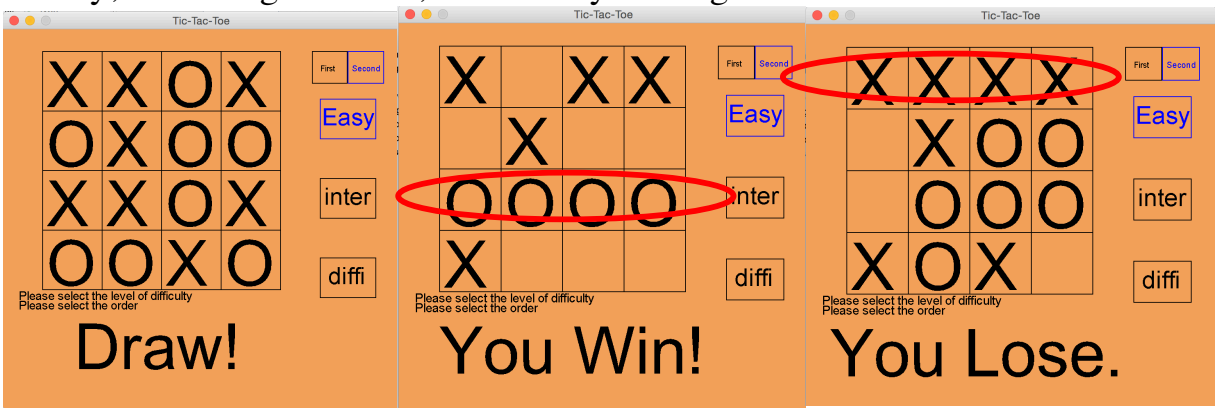
Next is to determine who go first:



The third step is to start the game (click the grid):
X is computer's move, O is human.



Finally, after the game over, it will tell you the game results:



Description
To design the level of difficulty of the game, I used different evaluation functions and different cutoff depth to realize. For the easy level, I only count the one X's and one O's, and the depth is 0. So the computer just places the chessman at random, and you can win easily. For the intermediate level, I use function$X_2 + X_1 - (O_2 + O_1)$ and the depth is 6. For difficult level, I use $6X_3 + 3X_2 + X_1 - (6O_3 + 3O_2 + O_1)$ and the depth is 12 (avoid exceeding reasonable time).

For the search.java, it is about the $\alpha\_\beta\ algoritm$. It need two parameters; one is the broad_size (the number of chessmen), another is the depth (to determine the cutoff depth and the level of difficulty).
a_b_search, **max_value** and **min_value** these three function are $\alpha\_\beta\ algoritm$. They will return a v value and choose the maximum v value to determine the next step of computer.
test function is used for terminal state testing.
eval function is used for cutting off search, return the v value to determine the next step of computer. Changing the evaluation can change the level of difficulty.
one, **two** and **three** functions are used for counting the number of X's and O's. (This data use for calculating the evaluation scores)

For the display.java, the code is used for GUI design.
It is a 4x4 chess board. The choice of difficulty is on the right. The choice of order is on right upper corner. When the game is over, it will show the result on the bottom of screen.