Comp 472 Project 2

Kimchheng heng 26809413

Mini max

- It will go depth down until the depth is reach the max or time is reach limit
- It is a recursive function so it would alter the max from T and F
- It check all the possible state of the Tic Tac Toe
- The state to finish increase rapidly compare to the size of the game board
- The first move always running longer since it evaluates all the possible state on the board

Alpha beta

- It is similar to Mini max
- But it can prune the unnecessary tree when Alpha >= Beta
- The Running time is better than Mini max

Heuristic function

- Trigger only when reaching max depth and time out
- Evaluate all the row, column and diagonal
- Check the index of X or O plus the line up size , if there no opposite opponent sign and block, it is possible for win
- Then return the value according to the player

Player Xunder AI control plays: x = C, y = 1

i Evaluation time: 0.0185051s

ii Heuristic evaluation: 360

iii Evaluations by depth: {0: 7, 1: 63, 2: 514, 3: 3958, 4: 27100, 5: 183660, 6: 1006938}

Depth

- The depth is chosen differently for player
- The more depth it is, the longer recursive it is. However, the time constraint also the affect the depth recursive
- The number of state increase when the depth is increase

The winner is O!

i Evaluation time: 3.0765316s

ii Total Heuristic evaluation: 1007045

iii Evaluations by depth: {0: 7, 1: 63, 2: 514, 3: 3958, 4: 27100, 5: 183660, 6: 1006938}