Some results on Tic-Tac-Toe and Quantum Tic-Tac-Toe

My strategic implementation of the classical game where first player starts the game:

Results:

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PROBABILITY OF FIRST PLAYER WINNING THE GAME = 0.584582
PROBABILITY OF SECOND PLAYER WINNING THE GAME = 0.288597
PROBABILITY OF THE GAME ENDING IN A DRAW= 0.126821

PROBABILITY OF THE GAME ENDING IN 5 MOVES= 0.095032
PROBABILITY OF THE GAME ENDING IN 6 MOVES= 0.087945
PROBABILITY OF THE GAME ENDING IN 7 MOVES= 0.264327
PROBABILITY OF THE GAME ENDING IN 8 MOVES= 0.200652
PROBABILITY OF THE GAME ENDING IN 9 MOVES (WIN)= 0.225223
PROBABILITY OF THE GAME ENDING IN 9 MOVES (DRAW)= 0.126821

PROBABILITY OF FIRST PLAYER WINNING THE GAME (P(terminal position reached in 5, 7, 9 moves))= 0.584582
PROBABILITY OF SECOND PLAYER WINNING THE GAME (P(terminal position reached in 6, 8 moves))= 0.288597
TOTAL PROBABILITY = 1.000000
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Image 1

In a random implementation of the classical game when the first player starts over 10000 runs:

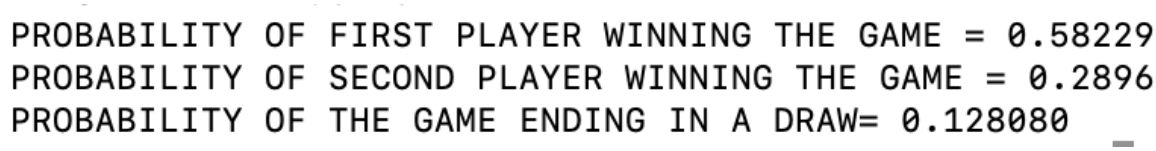

Image 2

In our implementation of quantum tic-tac-toe when first player starts the game:

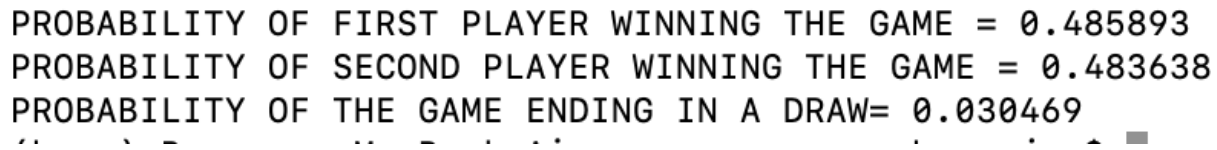

Image 3

We see that while in classical tic-tac-toe, the first player is usually at an advantage if it occupies a corner or central position, this advantage isn't as apparent in the quantum version of the game.

Files

Classical version:

1. Probabilities.c : to get the results shown in *Image 1.*
2. Randgameclassic.c : to play a random tic-tac-toe game where the user starts the game.
3. Randomtictactoe.c and simulationstictactoe.c : to get the results shown in *Image 2.*
4. Tictactoe.c : to play a random tic-tac-toe game where the computer starts the game.
5. Tictactoeboth.c : to play a random tic-tac-toe game where either the user or computer starts the game according to choice of the user.

Quantum version:

1. 2player_quantumtictactoe.c : quantum tic-tac-toe game with 2 users as players.
2. Quantumtictactoe.c : quantum tic-tac-toe where both players are computers.
3. Simulationsquantumgame.c and simwithprint.c : to get results shown in *Image 3.*