

# TIC TAC TOE

**Presented by Varshith, Hamsini, Naren**  
**CB.EN.U4CYS220-45,23,50**  
**TIFAC-CORE in Cyber Security**  
**Amrita Vishwa Vidyapeetham, Coimbatore Campus**

Feb 24, 2023



**AMRITA**  
VISHWA VIDYAPEETHAM



- 1 What Is Tic Tac Toe ??
- 2 Strategies To Win Tic Tac Toe
- 3 **Pointers On Winning**
  - Steps On Winning For First Player
  - Steps On Winning For Second Player
- 4 **Prototype**
- 5 **References**



# Overview Of TIC TAC TOE

This is a two player game. Players can choose between either one of the two symbols- “X” and “O” are the two most commonly used ones. The first player usually chooses “X” and the other player choose “O”. A player marks any of the 3x3 squares with his symbol and his goal is to create a straight line horizontally or vertically or diagonally



# Main Aim Of TIC TAC TOE

- Create a straight line before his opponent to win the game.
- Restrict his opponent from creating a straight line (horizontally, vertically, diagonally) first

The possible results are :

- First Player Wins
- Second Player Wins
- The game is a Draw



# Possibilities Of Winning TIC TAC TOE

If any player is able to draw three Xs or three Os in the following combinations then that player wins.

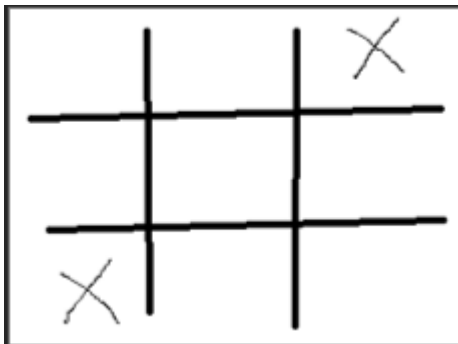
The combinations are:

- 1, 4, 7
- 2, 5, 8
- 3, 6, 9
- 1, 2, 3
- 4, 5, 6
- 7, 8, 9
- 1, 5, 9
- 3, 5, 7



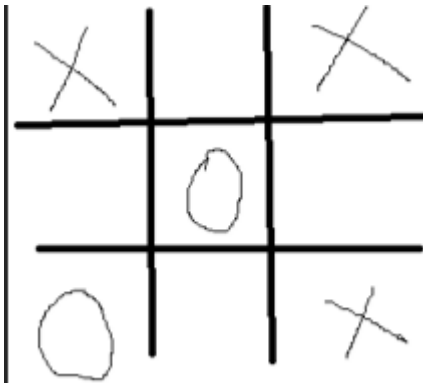
# Strategies To Win Tic Tac Toe

- It doesn't matter if you end up taking "X" or "O" or if you're going first or last.
- Try taking two opposing corners.



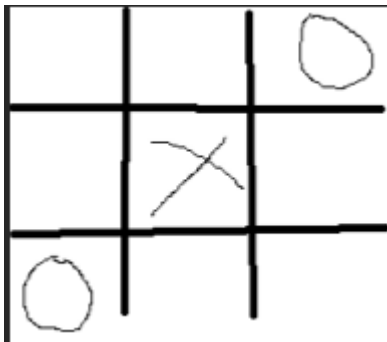
# Strategies To Win Tic Tac Toe

- Symmetry is always the best bet, so when contemplating a move, look for the one that will make the board as symmetrical as possible. Not only will it make your board look nice, but it will also block your opponent from being able to run away with a victory.



# Strategies To Win TIC TAC TOE

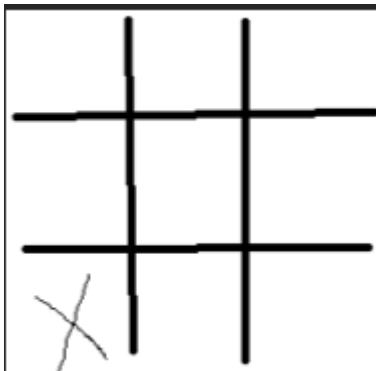
- If you're not able to win, at least try to make the game a draw. Being able to force a draw requires skill and strategy. If your opponent takes the middle square with an "X", the next move to ensure a tie is to place your letter in any of the corners. This way, there is no move that will allow them to win.





## Winning or drawing when playing first

- Play your "X" in a corner first: This gives it the opponents the most opportunity to make mistakes.

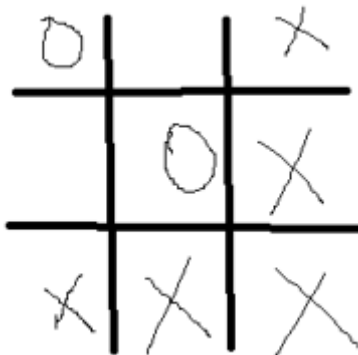


# Steps On Winning For First Player

- Try to win if your opponent plays the first O in the center. If your opponent plays their first O in the center, you have to wait for them to make a mistake before you can win. If they continue to play correctly, they can guarantee a tie. Here are your two options for your second move, followed by instructions on how to win if they make certain moves (if they don't, just keep blocking their plays and the game will be a tie):
  - Place your second X in the opposite corner from your first, so there's a line going "X -O -X" diagonally across the board. If they respond with an O in one of the other corners, you can win. Place your third X in the last empty corner, and your opponent won't be able to block you



# Steps On Winning For First Player

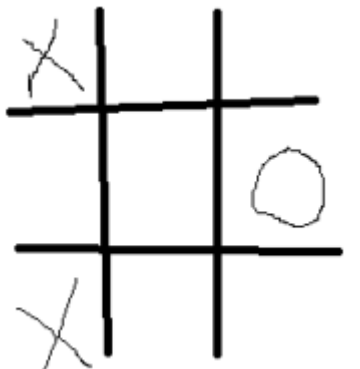


- Or, place your second X on an edge square, not the corner. If your opponent puts down an O in the corner which isn't adjacent to your X, you can block them from winning by putting an X there and subsequently winning.



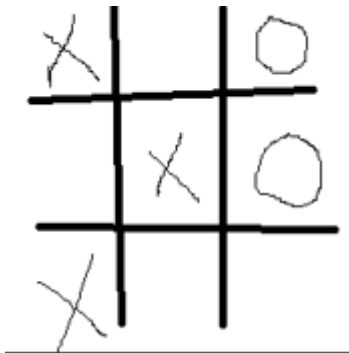
# Steps On Winning For First Player

- If your opponent, in their first move, doesn't put an "O" in the middle, you put your second X in any other corner.



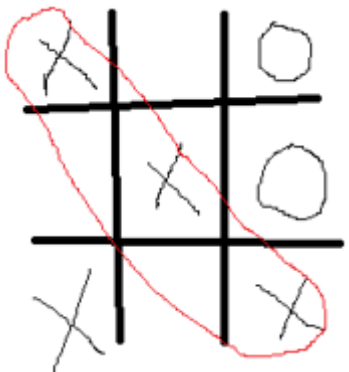
# Steps On Winning For First Player

- Place your third X in such a way that you have two possible winning moves



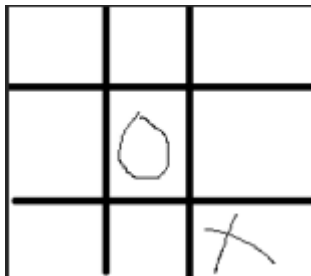
# Steps On Winning For First Player

- Win with your fourth X



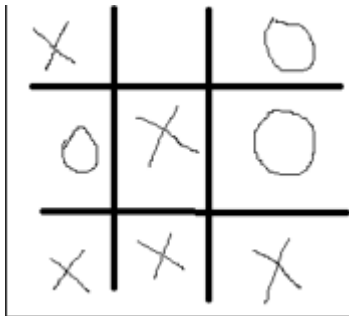
## Steps On Winning For Second Player

- Force a draw if the opponent starts in the corner. If the opponent plays first and starts with an O in a corner, always put your first X in the center. Your second X should be placed on an edge, unless you need to block your opponent from getting three in a row. In this section, your opponent is still playing O's, but remember they get to play first this time.



## Steps On Winning For Second Player

- Force a draw when the opponent starts in the center. When your opponent starts by putting down an O in the center, place your first X in a corner. After that, just keep blocking your opponent from scoring and the game will be a draw. There is essentially no way for you to win from this position, unless your opponent stops trying to win or stop you from winning!





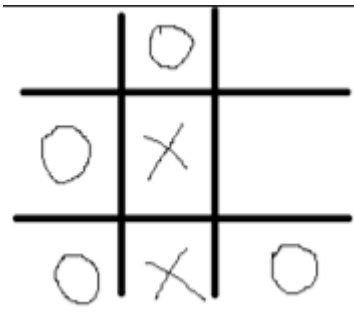
# Steps On Winning For Second Player

- Try to win if the opponent starts at the edge. Most of the time, your opponent will start with one of the moves above. However, if your opponent puts down the first O on an edge, not on a corner or center, you have a small chance to win. Put your first X in the center. If your opponent puts the second O on the opposite edge, making a row or column that reads O-X-O, put your second X in a corner. Then, if your opponent puts the third O in the edge that is adjacent to your X, making a line that reads O-X-O, put your third X in the empty square to block their row of two O's. From here, you can always win with your fourth X.



## Steps On Winning For Second Player

- If at any point, your opponent doesn't make the exact move described above, you'll have to settle for a draw. Just start blocking their moves and neither of you will win.



# Prototype

- A 2D array of 3x3 must be created to represent the "Tic-tac-toe" box
- X should start and O should follow. They will take turns.
- If three of X or O comes diagonally, horizontally or horizontally, then X/) wins respectively and game gets over

```
For i=0,i<3,i++  
  For j=0,j<3,j++  
    if(X is filled in M[0][0]&&M[0][1]&&M[0][2])  
      print("game over")
```

- And similarly, the same can be done for  
1, 4, 7 ; 2, 5, 8 ; 3, 6, 9;  
1, 2, 3 ; 4, 5, 6 ; 7, 8, 9;  
1, 5, 9 ; 3, 5, 7
- Since Flowgorithm doesn't support 2-D array it isn't possible to create a TIC-TAC-TOE program in it



<https://www.thesprucecrafts.com/tic-tac-toe-game-rules-412170>

<https://www.wikihow.com/Win-at-Tic-Tac-Toe>

<https://www.wikihow.com/Play-Tic-Tac-Toe> <https://www.gamesver.com/all-about-tic-tac-toe-purpose-rules-how-to-play-strategy/>

