

## Introduction:

Tic-tac-toe, noughts and crosses or Xs and Os is a paper and pencil game for two players who take turns marking the spaces in a three-by-three grid with X or O. The player who succeeds in placing three of their marks in a horizontal, vertical, or diagonal row is the winner. It is a solved game, with a forced draw assuming best play from both players.



## Objectives:

- Create a Game that can fulfil your gaming experience
- Forget about paper make it technological
- Requires less space

## Tools, Platform, Software Requirements, Specification:

### Tools:

Turbo C3

C++

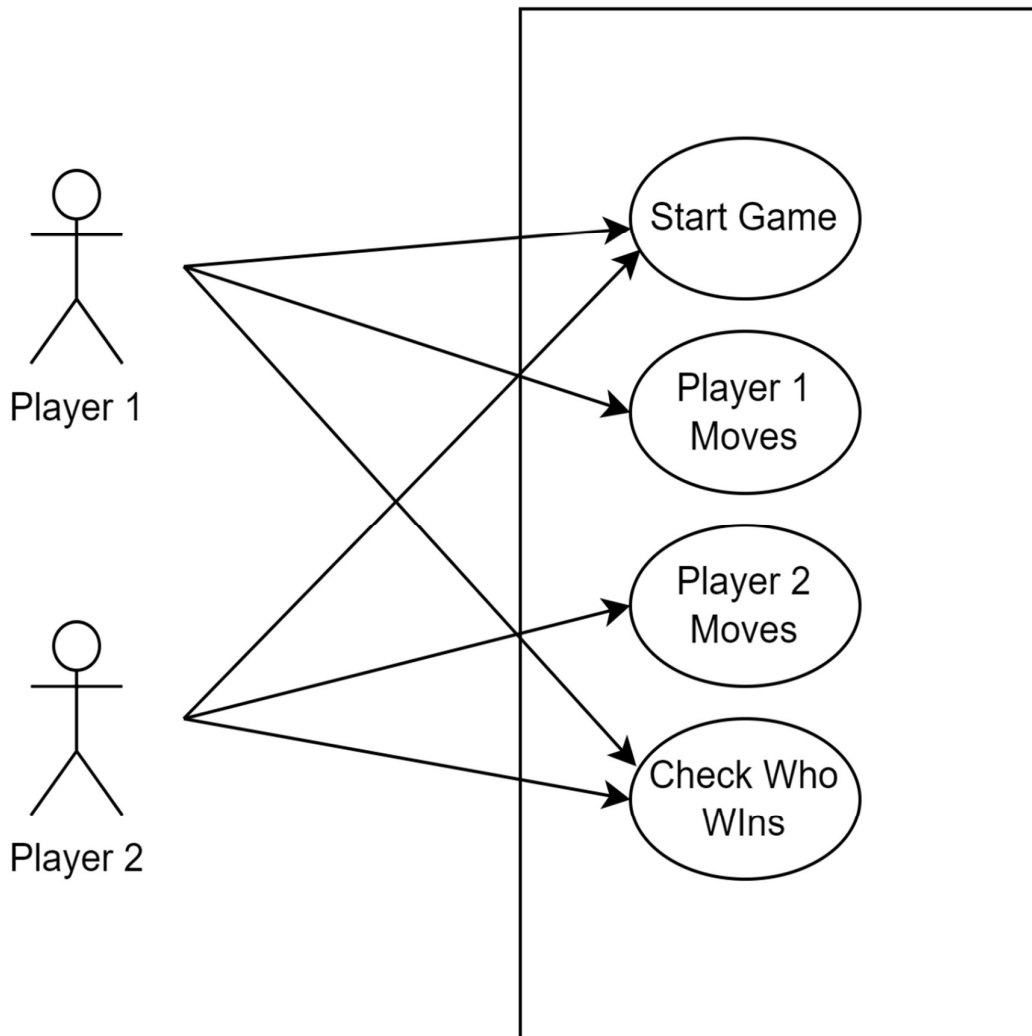
### Platform

Windows 7/8/10

### Hardware Requirements:

Disk Space	300mb for Turbo C3, and 50 mb for Game Files
RAM	Minimum 4gb Ram required
Turbo C3 Version	3.0 32-64bit

## Use Case Diagram:



The game is played in a 3x3 grid. The game is played between Two players

- 1) Human
- 2) Computer

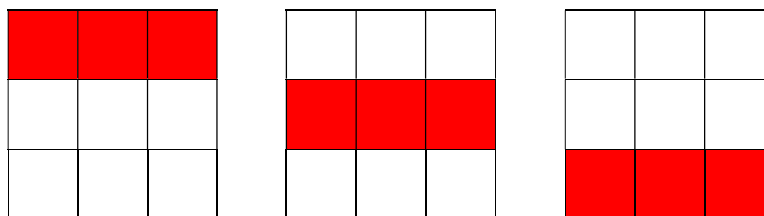
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## VS Human:

- Step 1. Start
- Step 2. Get User input
- Step 3. Check if invalid or not
- Step 4. If invalid go back to Step 2
- Step 5. Check for win
- Step 6. If Win Display Win status
- Step 7. Else Switch Player and go to Step 2
- Step 8. End

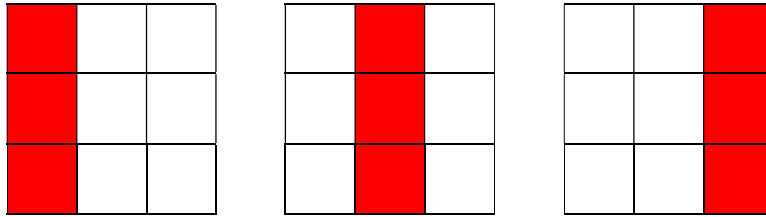
## Game Logic:



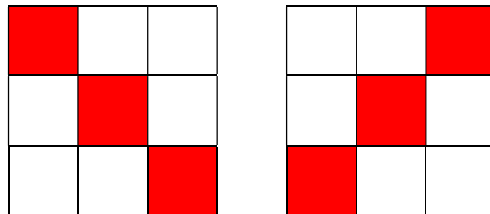
Win condition when all the slots in a row are occupied by a same player move

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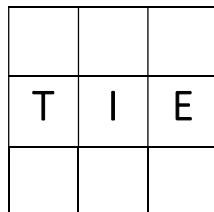
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Win condition when all the slots in a column are occupied by a same player move



Win condition when all the slots in the diagonal are occupied by a same player move



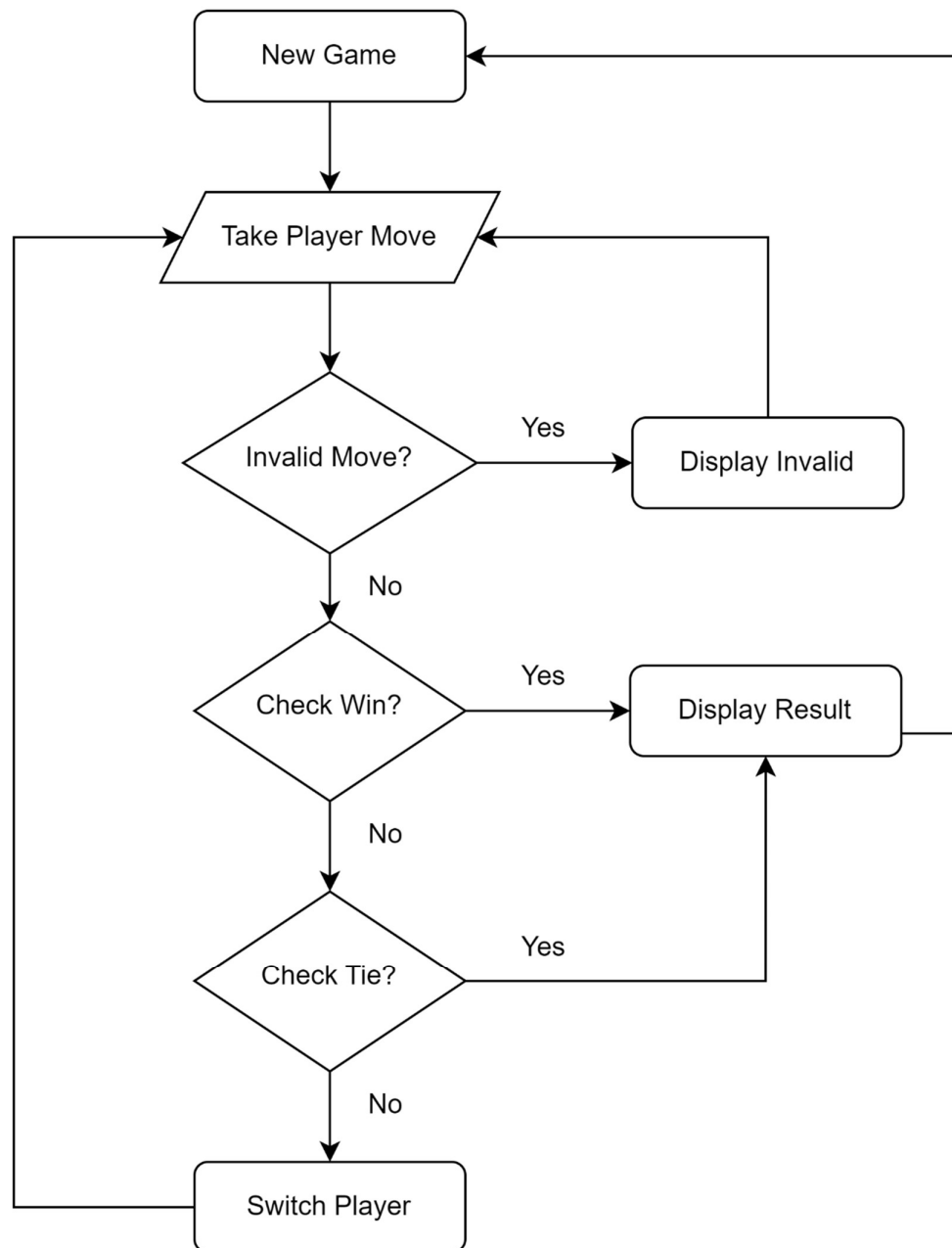
Tie Condition when all the slots are filled and there is no win condition

We check Win/Tie condition Every time Player plays a move. Player cannot place his/her move in the slot which is already occupied.

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## Flowchart:



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## VS Computer/ Ai:

### Objective

- Create logic to play against computer
- Computer can block moves, and play like a real person

### Win moves:

1	2	3
4	5	6
7	8	9

Suppose, this is our play area. If Computer has O in 1<sup>st</sup> slot and in 2<sup>nd</sup> slot it will check if the 3<sup>rd</sup> slot is empty or not and will place its move in the third block to win.

There are total of 24 winning conditions we have to check

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

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## Blocks:

X		
	O	

X	X	
	O	

X	X	O
	O	

Let's take an Example, suppose we Placed X in the 1<sup>st</sup> slot, Computer Randomly places O in any Empty slot. We then Placed a X in 2<sup>nd</sup> block Thinking about making a 1-2-3 Win. Computer Will detect this situation and block the player's next move and won't let him/her win.

Like before here also we have 24 Blocking moves

## How should it work?

Computer should firstly try to go for Winning moves, if it has no situation where it can win, it will look whether it can block the players turn and stop him from winning.

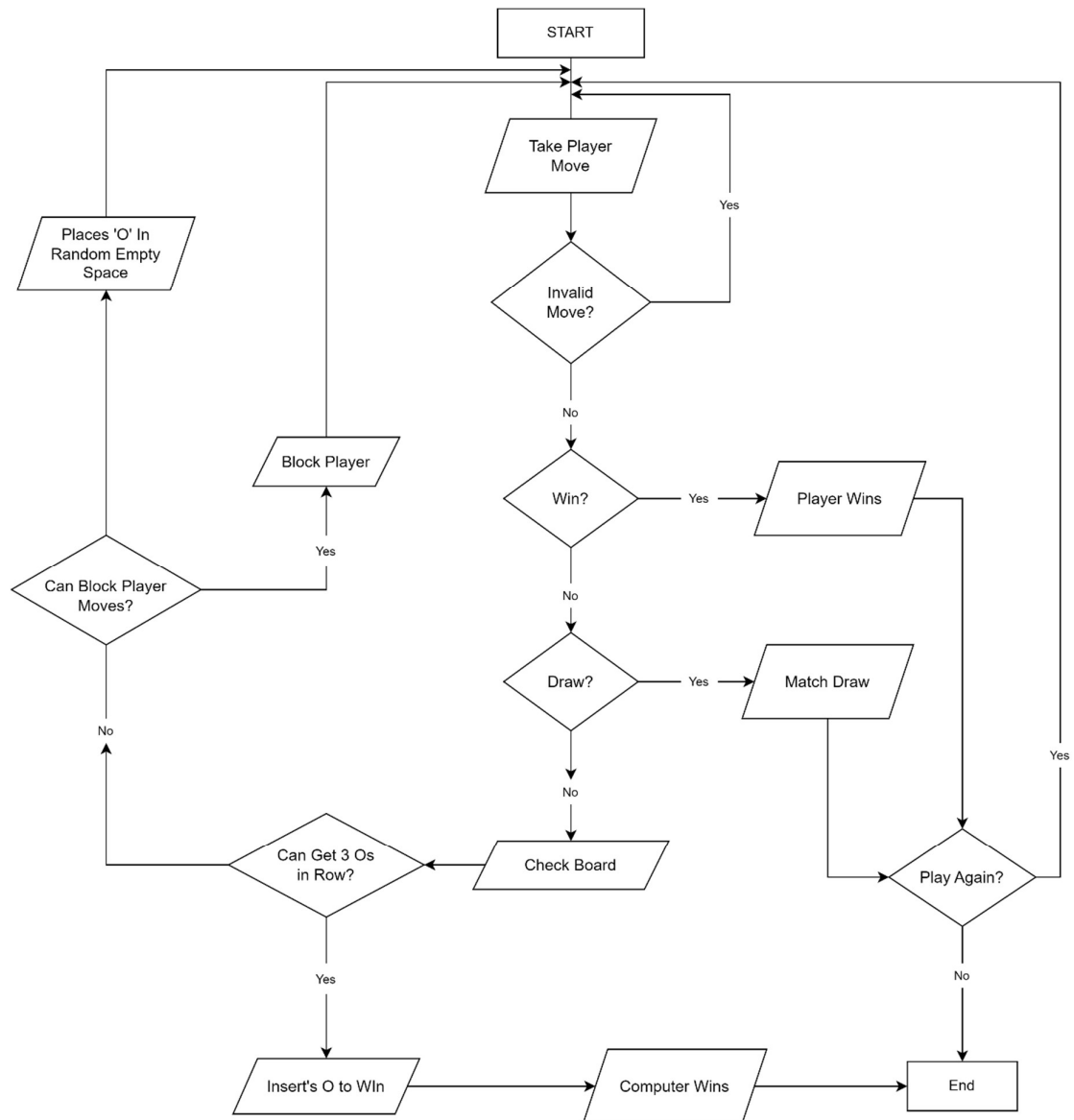
Suppose there is no condition where it can neither win or neither block it will simply place O in a random empty slot.



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## Flowchart:



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## Design:

- ✓ Making it more playable we have to add both Single player (VS Computer) mode and Multi-player (Player VS Player) mode
- ✓ Add Functions like Exit and Reset
- ✓ Make the game GUI look better using graphics.h

## Limitations:

- The game is only playable using keyboard
- Computer has Iq of a 6<sup>th</sup> grade student

## Future Plan:

- Adding better animations and music to the game
- Making the Computer compatible enough to trick player and winning most of the times
- Interchangeable GUI

## Conclusion:

The Tic Tac Toe game is most familiar among all the age groups. Intelligence can be a property of any purpose-driven decision maker. This basic idea has been suggested many times. An algorithm of playing Tic Tac Toe has been presented and tested that works in efficient way. Overall, the system works without any bugs.

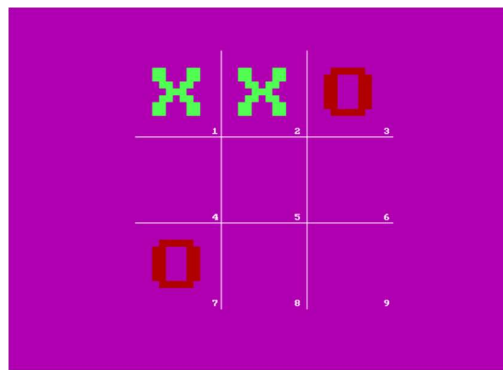
## Our Layout:



Game Menu



Loading Screen



Game Area



Game Controls

## Extra Features:

Changeable GUI

We appreciate so much the opportunity you gave us to  
present our group today.