**INTRODUCTION:**

Tic-tac-toe is a simple, two-player game that, if played optimally by both players, will always result in a tie. The game is also called noughts and crosses or x’s and o’s.

Tic-tac-toe is a game that is traditionally played by being drawn on paper, and it can be played on a computer or a variety of media. Other games, such as connect, are based on this classic.

**RESEARCH:**

History:

An early variation of the game was played in the Roman Empire, around the 1st century B.C. It was called "Terni lapilli," which means "three pebbles at a time." The game's grid markings have been found chalked all over Roman ruins. Evidence of the game was also found in ancient Egyptian ruins.

The first print reference to "noughts and crosses," the British name for the game, appeared in 1864. The first print reference to a game called "tick-tack-toe" occurred in 1884 but referred to a children's game played on a slate.

Equipment:

The goal of tic-tac-toe is to be the first player to get three in a row on a 3-by-3 grid or four in a row in a 4-by-4 grid.

To start, one player draws a board, creating a grid of squares, usually 3-by-3 or 4-by-4.

In a 3-by-3 grid game, the player who is playing "X" always goes first. Players alternate placing X’s and Os on the board until either player has three in a row, horizontally, vertically, or diagonally or until all squares on the grid are filled. If a player can draw three Xs or three Os in a row, then that player wins. If all squares are filled and neither player has made a complete row of X’s or O’s, then the game is a draw.

One of the game's best strategies involves creating a "fork," which is placing your mark in such a way that you have the opportunity to win two ways on your next turn. Your opponent can only block one, thereby, you can win after that.

The gameplay is the same if you are playing on a 4-by-4 grid. The "X" player goes first. And, players alternate placing Xs and Os on the board until a row is completed horizontally, vertically, or diagonally, or all 16 squares are filled. If all 16 squares are filled and neither player has four in a row, the game is a draw.

**VARIATIONS:**

Tic-tac-toe can be also be played on a 5-by-5 grid with each player trying to get five in a row.

The game can also be played on larger grids, such as 10-by-10 or even 20-by-20. For any grid of 6-by-6 or greater, it might be best to make your goal to get five in a row. This turns the basic game of tic-tac-toe into a much more complex game with similarities to the board game Pente, meaning "five" in Greek. Similarly, the goal of Pente is for a player to score five marks in a row

Diagram, engineering drawing

Description automatically generated

**4W's AND 1H:-**

Who:

* This game can be played by people of all age groups.

When:

* while having free time we can play with family or friends, to reduce stress and pressure and in the learning stages for children.

Why:

* It's a digital form of technique game called tic-tac-toe.

Where:

* At any place where available draw on the piece of paper and play.

How:

* Firstly take plain paper and draw two vertical lines or horizontal lines one above another.
* So, now you get 9 boxes, enter your input in any box, and same task to your opponent.
* Who maxes xox or oxo first will win.
* So, make it wise to not complete box or oxo for your opponent.
* Digitally, code blocks will execute and create the same diagram which is like the same on paper

**SWOT:**

Strengths:

* A very quick and simple game.
* Can be played by people of any age group.
* Helps children practice counting and adding.
* Easy to design.

Weakness:

* Can lead to addiction in children.
* With the increase in several players, the time delay increases.
* The design of the board with too many choices increases the chances of a player getting long.
* Waiting for the chance to make xox or oxo is very irritating.

Opportunities:

* The game can be further developed to make it more fun and interesting.

Threats:

* Due to the development of many digital games, technique games like "Tic-Tac-Toe" face the threat of extinction.

**HIGH-LEVEL REQUIREMENTS:**

* Users should be able to read data from file
* The user should be able to modify the data in the file
* If the game is not working properly, should raise an issue
* If the game is working properly, selecting the number of players
* When a player wins, The game should print a message and exit the program
* The game should correctly calculate and update the position values based on the roll

**LOW-LEVEL REQUIREMENTS:**

* Good readability of the code
* The messages printed by the game should be catchy and encourage the players to play another round
* The game code should be open for development
* Implementing more than 5 players in one game