## Tic Tac Toe Implementation using Multi Agents

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### TIC TAC TOE

Comparison of Min-Max, Alpha-Beta Algorithm and Reinforcement Learning Agents in solving the Tic Tac Toe Game.

# Objectives



Design Adversarial Search Algorithm and Reinforcement Agents to solve Tic Tac Toe game.



Design of 3 Artificial Intelligence Agents: Q learning Technique, Min-Max Algorithm, Alpha-Beta Pruning



Plays Tic Tac Toe game multiple times among them to find the efficient Algorithm.



The player who gets the three consecutive symbols in a row or column or diagonally gains a winning point.



Compare the efficiency of three algorithms by calculating the corresponding performance metrics and to find out which performs better either adversarial search or Reinforcement Learning.

## Approaches



The first Approach is Q-Learning from Reinforcement Learning.



The Second approach is Adversarial Search.

- 1. Min-Max Algorithm
- 2. Alpha-Beta Pruning.



**Technology Stack: Python 3** 

#### Results

Documentation model which gives details about the Tic Tac Toe game implementation using Min-Max, Alpha-Beta and Reinforcement Learning Agents.



Algorithms developed for AI Agents using Python Programming Language(.py files)



Youtube video
Demonstrating project
implementation and slides



Github Repository link for Python code and related files.

#### **Evaluation Methodology**

Project is evaluated based on the implementation of all the AI agents

Graphs depicting the performance comparisons

To determine the most efficient agent, tally the number of victories achieved by the agent in one-on-one matches played multiple times

A comparison table is given to the three agents based on the Tic Tac Toe moves, corresponding score, and win rate.

Time and space complexity comparison for the three agents will be implemented