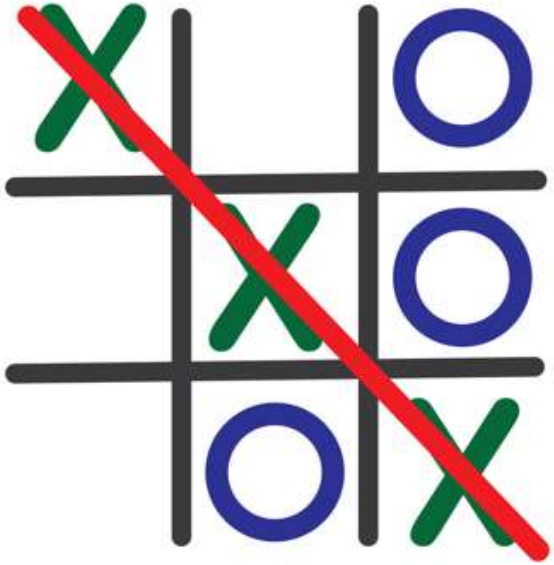
Multi-Agent Strategies for Tic Tac Toe



AI-Team Project

Team-23

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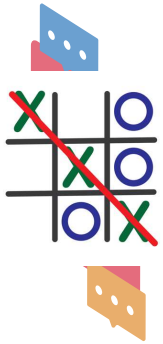
Objectives

1. Developing strategies for Tic Tac Toe: Creating Search Algorithm and Reinforcement Agents to win at Tic Tac Toe.

2. Creating 3 types of AI: We use Q-learning, Min-Max Algorithm, and Alpha-Beta Pruning to build different AI players.

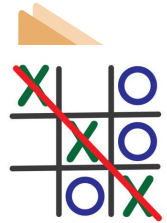
3. We will Have them play multiple games: Let these AI players compete against each other to see which one is most effective.



4. Determining winning conditions: A player earns a point by getting three symbols in a row, column, or diagonal.

5. Comparing algorithm efficiency: Evaluating the performance of each algorithm to see if adversarial search or reinforcement learning works better.

Approach

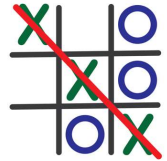


One Strategy: Implementing Q-Learning within Reinforcement Learning.

Another Strategy: Utilizing Adversarial Search Techniques.
1. Applying the Min-Max Algorithm.
2. Implementing Alpha-Beta Pruning.

Technology stack: Python 3.

Deliverables



Documentation Model

Detailed instructions (Documentation model) on how we made Tic Tac Toe game smarter using different methods like Min-Max, Alpha-Beta, and Reinforcement Learning.

Hands-On-Programming

Ready-to-use computer programs (Algorithms) written in Python for our smart Tic Tac Toe players.

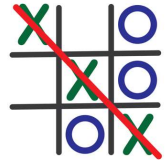
Presentation

A video on YouTube showing how our project works, along with a presentation slide.

GitHub

A link to our project's code and related files on GitHub, so anyone can see how it's done.

Evaluation methodology



1. Reviewing how well each AI agent was built and functions.

2. Using graphs to show how each agent performs compared to others.

3. Deciding which agent is best by counting how many times each one wins in repeated matches.

4. Creating a table to compare the agents based on their moves, scores, and how often they win.

5. Comparing the time and space complexity of the three agents to see which one is most efficient.

Thank You!