

Pokemon Showdown Bot

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Background

- Browser based Pokemon battles simulator
- Contains gamemodes for all 9 generations of pokemon
- Used for competitive and Casual gameplay
- This bot focuses on Gen8 Random battles



Problem Definition

- Over 1 billion possible team combinations for each player
- Up to 13 actions per player per turn
- Up to 169 possible successor game states per turn
- Need to consider stats, items, abilities, status conditions, and field conditions
- Game ends when all 6 of one players pokemon faint or a player forfeits





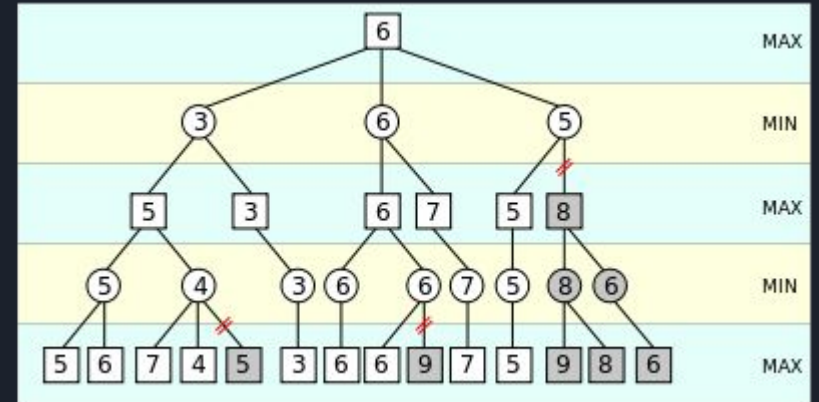
Use Cases

- Learn Pokemon Strategy
- Get better understanding of zero sum two player games
- Have fun annoying your friends or toxic players

☆**YouShallNotSweep:** you only won because you suck so much I couldn't comprehend it

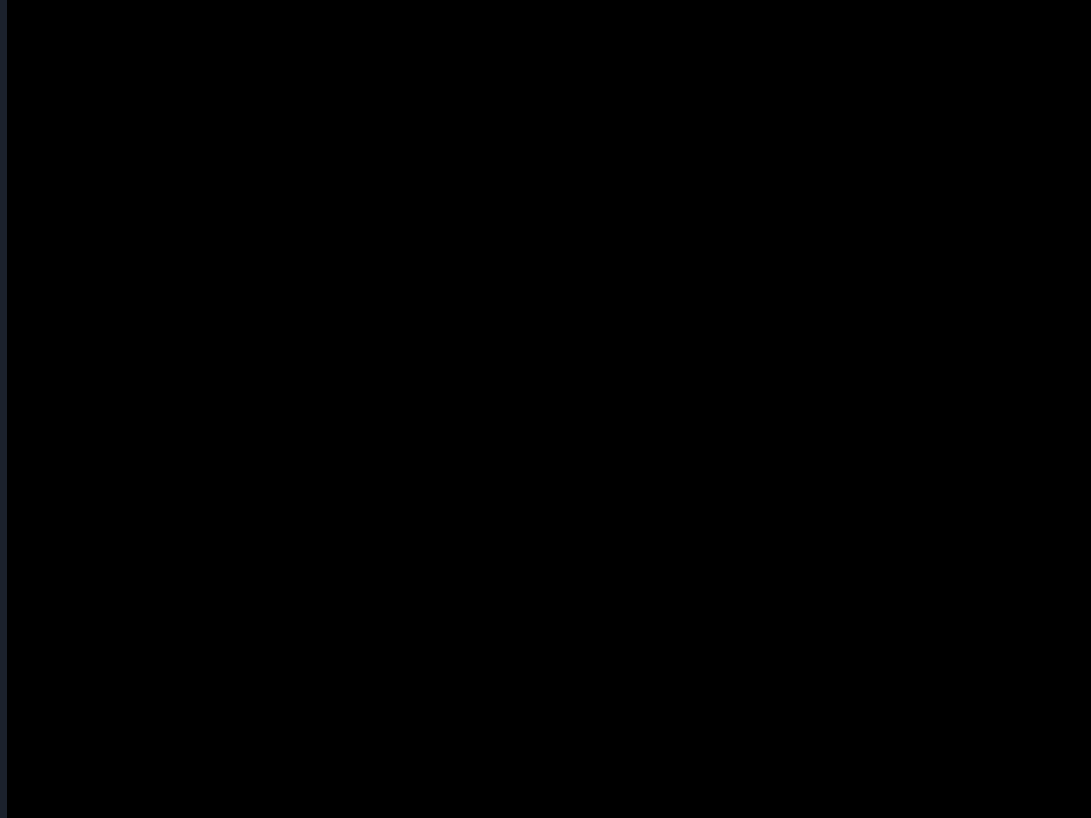
Algorithm

- Use of publicly available game engine to get all possible actions and their outcomes
- Use that information for a MiniMax algorithm that utilizes alpha-beta pruning
- Search depth of 3
- Bot stores the following data for each opponent
 - Pokemon
 - Pokemon's moves
 - Pokemon's stats and status conditions
 - Items
 - Abilities
 - Use of Dynamax





Demo





Results after 100 games

- My bot's rankings:
 - ELO Rating 1302
 - W: 57 L: 43
 - Glicko 1571 ± 33 (true Rating)
 - GXE 59.3% (estimated chance of winning against the average player)
- Current #1 player's rankings:
 - Elo Rating 1705
 - *Glicko* 1854 ± 28
 - GXE 86.7%
 - W/L unknown



Bot's Behavior Pros and Cons

PROS

- Can effectively determine good actions based on type matchups and damage calculations
- Sophisticated switch in strategies
- Able to determine and keep track of abilities and items efficiently

CONS

- Has difficulty dealing with status conditions and field effects (screens, substitutions, terrain, etc)
- Does not utilize strategic roles of pokemon:
 - Damage dealers, tanks, supports
- Will often neglect threats in order to raise its stats
- Struggles to form long term strategies

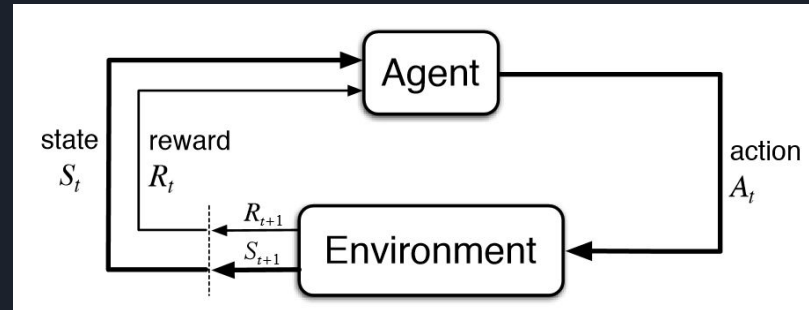
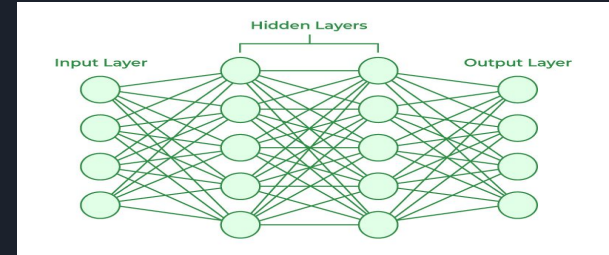
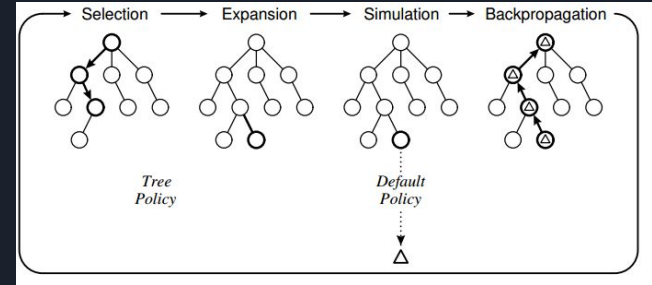


Limitations of the bot

- Unable to work on gamemodes for generation 9 of pokemon due to the datasets of the gamemodes changing every two weeks
- The bot sends and retrieves a lot of messages to the showdown server which has cause the account to get banned 3 times during testing and result collecting

Potential future work

- This bot utilizes MiniMax search but there are other strategies that could be implemented such as
 - Reinforcement learning
 - Monte Carlo Search Tree
 - Neural Networks
- Comparison of these different implementation of bots could lead to some interesting results



Questions?

