AI Project Mid-Report

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October 21, 2025

1 Introduction:

Our team is building a "Professional Pokemon Battle Simulator. The goal of this system is for it to beat professional Pokemon players in battle. There are several important components. There is a data loader Python file that reads in data from three separate CSV files. These files are contain information on abilities, moves, and Pokemon stats. This data is to be used inform decisions in the other Python files. There will also be a file that use natural language processing to inform what moves and abilities are based on descriptions in CSV files. Those files include a team builder and an AI Battler. There is also a main file to run all of these in conjunction.

2 Data Loader Explained:

As said prior, this Python file read in data from the three CSV files to use in team builder and AI Battler files. It uses several imported libraries, but the most important is "import pandas as pd". This is the library for reading in .csv files. This file contains classes like "Move" and "Pokemon" so that it can understand the data and use it is reading in. It does not yet have an ability class, although that will be added by the completion of the project. This file will also take in data from a competitive analytics website for Pokemon (*https://www.pikalytics.com/pokedex/gen9vgc2025regh.*) This website contains data for singles battle, such as: The most often used items, abilities, and moves of Pokemon. It also has percentages associated with how often that Pokemon is used, as well as for its different characteristics like items, moves, and abilities. That is not yet finished, but it is being worked on currently.
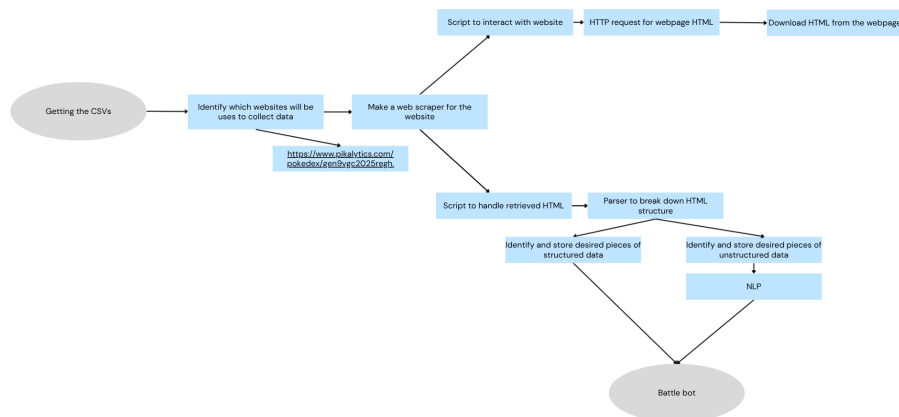
Figure 1: Web Scraper Design

3 NLP Component Explained:

As mentioned above, NLP will be used to break down and parse natural language found in some of the .csv files. This will include data such as Pokemon moves, abilities, and items. The NLP file will first tokenize the natural language. Then it will attempt to find known elements of that specific piece of data. For example, the NLP program would look for an indication of damage when analyzing a move. To do this the program will need to be able to perform syntax and grammar analysis on the tokenism data. The result of this analysis should produce a set of organized and structured data that the Pokemon game can use. While this may seem like a lot of work just to get Pokemon data, this program will be able to provide current data about the Pokemon game. By having current data instead of a single snapshot of the data, the AI bot will be able to better keep up with the strategies and metas in actual professional Pokemon. This important factor will enable the battle simulator to play at a professional level.
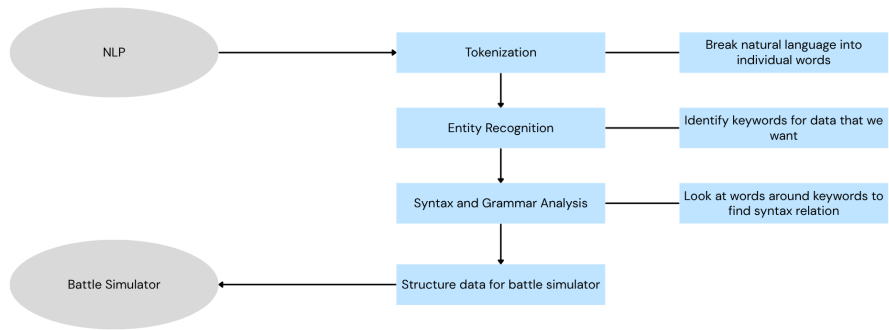
Figure 2: NLP Design

4 Team Builder Explained:

The team builder file uses data from CSV files in conjunction with pikalytics data. This builder will make Pokemon for multiple teams by creating their stats, moves, abilities, and items. It will use several factors. This algorithm will start with giving it at least 2 attacking moves, then give at least one setup move. We have yet to determine how the fourth move would be decided. Held Items will be decided by what is most used. That could change to be a more complex algorithm if the project is finished and tested with time to spare. The same applies to ability selection. Figure one below defines the Pokemon class.

5 AI Battler Explained:

This File contains several important functions. It will have a rule-based system for battling. It also contains the actual AI Battler for the player to fight. It will run the battle simulator. The AI will use the defined algorithm recursively to predict its win state. It will change the algorithm slightly if it does not find a win state to run again. We have designed the original algorithm, and are currently working on slightly changed algorithms if it does not find the initial win state. The Completed algorithm is shown below in Figure two. There will be a GUI implementation. However, that has not been addressed yet.
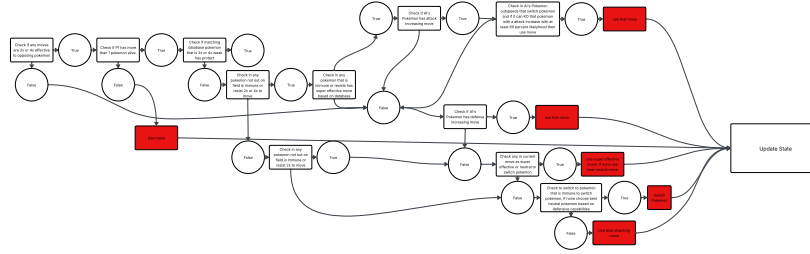
Figure 3: AI Battler Decision Tree

6 Main Explained

The main just runs these files in conjunction.

7 Additional Scope If Able

1. More sophisticated item selection algorithm

2. More sophisticated ability selection algorithm

3. Further expansion on AI Battler algorithm

4. Read in additional data to be used in predictions

References

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[3] T. Buck gen9pokemonmoves.csv, from https://www.kaggle.com/datasets/timbuck/pokemon-generation-9-scarlet-violet-datasets/data

[4] T. Buck gen9pokemonabilities.csv, from https://www.kaggle.com/datasets/timbuck/pokemon-generation-9-scarlet-violet-datasets/data

[5] T. Buck gen9pokemonstats.csv, from https://www.kaggle.com/datasets/timbuck/pokemon-generation-9-scarlet-violet-datasets/data