**Pokémon Knowledge Base**

This knowledge base represents some of the facts and rules regarding Pokémon, Pokémon types, and specific instances of hypothetical Pokémon characters which could enact various scenarios when interacting with each other (mostly through combat).

**Facts**

Firstly, it was necessary to start with a hierarchical structure of the Pokémon: all characters in this domain were considered Pokémon, so Pokémon was the superclass. Subclasses of Pokémon included different types of Pokémon, such as ‘fighting’, ‘fire’, or ‘poison’. For each type of Pokémon, there are many different species each character can be, such as a ‘Pikachu’ or a ‘Bulbasaur’, and so another set of facts was created to represent some of the Pokémon species. A set of 15 specific characters was then created, each given in the format “[‘name’, is, ‘species’].” The various ages of the characters were specified using “is\_age”. Characteristics such as Legendary and Starter Pokémon were also included.

Some of the Pokémon characters in the domain were of the same family group; for simplicity, we chose just a few characters to have children. To initiate the battles, facts using ‘X attacks Y’ were used to demonstrate who attacks who in our scenario. Furthermore, we decided that some Pokémon would be armed with defence equipment, and used ‘armed’ to demonstrate this.

**Rules**

It was then necessary to create the ruleset from which inferences could be made. We started with general logic and set-theoretic rules, which included the transitive nature of the subclass relation, for example.

Taxonomic relationships included basic family relationships, such as the fact that a parent of a parent of a character is a grandparent to that character, and that a grandparent of a character is a grandchild.

Semantic relations helped elucidate who – intuitively – could not beat another in an attack (for example, if a Pokémon is neutral to another, or beaten by another, they cannot beat them). We considered these semantics since these conclusions naturally follow from their antecedents.

Domain-specific rules were included, such as strength and weakness rules for attacks according to Pokémon type. This mostly adheres to Pokémon convention, with some types excluded for brevity. It should be noted that weakness rules are their own category, and are not directly correlated with strength rules (If X is stronger than Y when attacking, Y is not necessarily weaker than X when initiating the attack).

Other rules included evolution (the fact that starter Pokémon above a certain age have the ability to evolve), rules for attacking (such as who becomes vulnerable or resistant when involved in an attack), rules for protective parents (parents will get angry when their child is attacked by someone stronger than them, will want to intervene if they have the strength to, and will definitely intervene if their child is also very young). Finally, a set of defence rules was established for methods of defence (such as being armed or being saved by another Pokémon, such as a parent).

Certain default rules were needed; for example, to be able to deduce when a Pokémon would beat another in an attack, since it was necessary to ensure that first the other Pokémon was in a vulnerable position and with no established means by which to defend themselves and no ability to evolve. The final set of rules determines the consequences of battle.

**Limitations**

One of the limitations we encountered during the creation of the knowledge base was that pre-existing facts and rules could not be overwritten once established. Therefore, we were unable to express, for example, a Pokémon starting out as one type and evolving into another type, as we could not render their initial type obsolete. We were only able to state that they evolved, adapting the Pokémon convention to allow evolution within types. We were also unable to express time effectively, and so we had to construct a static environment of relationships, attacks, and defence.