## *COSC344 Assignment 1*

Team **1**

Leader **Sam Fleury**

Members: **Sam Fleury**, **Tomofumi Kimura**, **Daniel Davidson, Brock Fairweather**

#### Mini-world Description

The mini-world we are modelling is the battle-related parts of a Pokémon game.

* Each **Pokémon** has a nickname, a Pokédex number, a unique ID, a record of the time and date it was caught, a type (as explained below), and a maximum number of Hit Points, and each is owned by a trainer.
* Pokémon have **moves** that they can use in battle. Each move has a **type**, and each Pokémon has one or two. A move’s type determines how effective it will be depending on the type of the opponent. Each move has a unique name, a category (whether it is a physical, special or status inflicting move), power, accuracy and sometimes special effects. Each move can be learned by multiple Pokémon, but the number of times it can be used (Power points) varies from between Pokémon.
* **Trainers** are non-player characters who the player has Pokémon battles with throughout the game. We store each Trainer’s unique ID, Name (names are not unique in the game), Money (Trainers give money to main player if player wins), Number of Pokémon, and Number of Items.
* Trainers can use **items** during combat. Each item has a name and a number of effects. Instances of each item can be owned by many different trainers, and the quantity of an item each trainer has varies.
* **Towns** are locations in which gyms are found and trainers can reside. Towns can also contain Poké Marts (Shopping stores) and Pokémon Center (Hospital for Pokémon) in which trainers can shop for items or heal their Pokémon respectively. Each town can have a gym, a Pokémon Center, but may have more than one Poké Mart.
* **Routes** are pathways which connect the main Towns together and can be inhabited by Pokémon as well as trainers. Trainers will patrol the area and challenge other passing trainers. Each Route that contains Pokémon can have a variety of species and varying numbers of patrolling trainers.
* **Gyms** are locations found throughout the world where player can battle the Pokémon of Gym trainers. Gyms are weak entity type because if trainer did not exist, it means gym also can not exist. Each gym has random number of trainers. One trainer is a gym leader. Once player beat the gym trainers then player can move forward. It contains unique name, number of trainers.

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#### Entities and Attributes

MOVE

* Name: Simple, Single-Valued String Key Attribute
* Category: Simple, Single-Valued Domain/String:

{Special, Physical, Status}

* Power: Simple, Single-Valued Integer
* Accuracy: Simple, Single-Valued Integer
* Special Effect: Simple, Multi-Valued String

ITEM

* Name: Simple, Single-Valued String Key Attribute
* Effect: Simple, Multi-Valued String

TRAINER

* ***Trainer ID*** Simple, Single-Valued Number Key Attribute
* Name Simple, Composite: String

(Fname, Lname)

* Money Simple, Single-Valued Integer
* Number of Pokémon Derived Single-Valued Integer
* Number of Items Derived Single-Valued Integer

GYM (**weak Entity**)

* Name Simple, Single-Valued String **weak Key**
* Number of Trainers Derived Single-Valued Integer

TOWN

* Name Simple, Single-Valued String Key Attribute
* Number of Poke-Marts Simple, Single-Valued Integer
* Number of Poke-Centres Simple, Single-Valued Integer

ROUTE

* Route Number Simple, Single-Valued Integer Key Attribute

POKEMON

* Name Simple, Single-Valued String
* Pokémon\_ID Simple, Single-Valued Integer Key Attribute
* Pokedex\_no. Simple, SIngle-Valued Integer
* Time\_Caught Simple, Composite: ***Date***, Time

(Date, Time)

* Max\_HP Simple, Single-Valued Integer
* Level SImple, Single-Valued Integer

TYPE

* Name Simple, Single-Valued String Key Attribute

#### Relationships

KNOWN\_BY

* M:N Relationship
* One move can be used by multiple Pokémon and each Pokémon can have up to four moves
* Has an attribute Power Points indicating the number of times the Pokémon can use the move
* Both are partial participation

USED\_BY

* M:N Relationship
* One item can be used by multiple trainers and each trainer can have multiple items
* Has an attribute quantity telling how many of the item a trainer has
* Both are partial participation

MOVE\_IS\_TYPE

* 1:N Relationship
* Each move can be of one type only but types are shared by many moves
* MOVE is partial participation, TYPE is total participation

LOCATED\_IN

* 1:1 Relationship
* Towns can only have one gym, each gym can only exist in one town
* TOWN is total participation, GYM is partial participation

PATROLS\_IN

* 1:N Relationship
* One route can have many trainers, each trainer only patrols one route
* ROUTE is total participation, TRAINER is partial participation

LIVES\_IN

* M:N Relationship
* One route can have many pokemon and one type of pokemon can be found in many different route.
* Both are partial participation

GOES\_TO

* N:1 Relationship
* There can be many routes into one town
* ROUTE is total participation, TOWN is partial participation

IS\_LEADER\_OF

* 1:1 Relationship
* Each GYM needs to be lead by one trainer
* GYM is total participation, TRAINER is partial participation

POKEMON\_IS\_TYPE

* M:N Relationship
* Each Pokémon can have up to two types, and any number of Pokémon can share a type.
* Both are total participation.

IS\_NOT\_EFF &

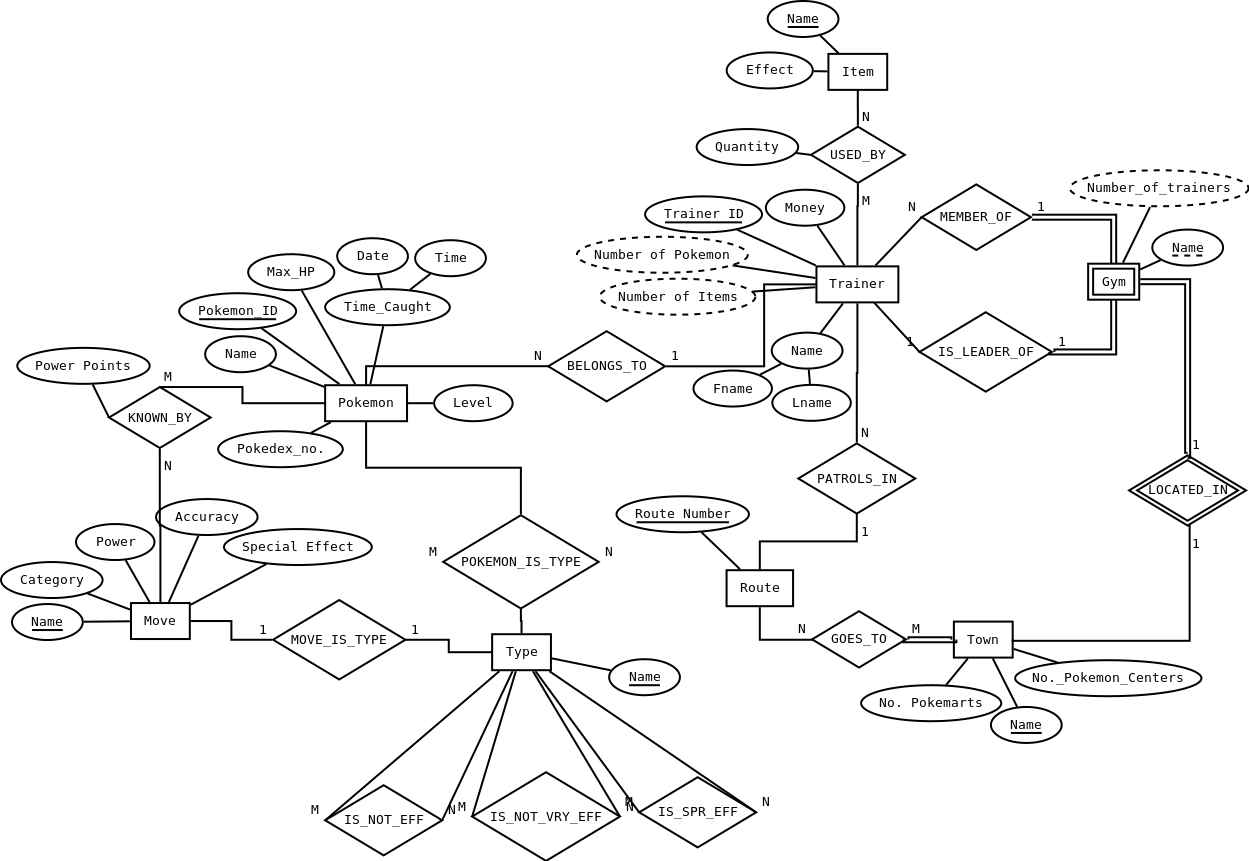
IS\_NOT\_VRY\_EFF &

IS\_SPR\_EFF

* M:N Relationship
* Each type can be good, bad, or completely ineffective against any number of other types.
* Each type has at least some of these very similar relationships with other types, but not necessarily all, so partial participation.

#### Teamwork Summary

* Tasks were allocated early on for each member to work on individually. Two meetings were held where each members work was discussed and added to the project.
* Daniel modelled the ITEM and MOVE entities and their attributes. He modelled the KNOWN\_BY and USED\_BY relationships. He also wrote the descriptions of these in the report. This work was discussed among team members and consensus was reached.
* The Trainers Entity type, Gym Entity type, the attribute of these entity type, and MEMBER\_OF, IS\_LEADER\_OF were modeled by Tomofumi Kimura. He also wrote the description of Trainers and Gym entity type in the report. This work was discussed among team members and consensus was reached.
* Brock wrote the description and modelled the TOWN and ROUTE entities, the attributes and the relationships they had with Pokémon ( LIVES\_IN ), Trainers ( PATROLS\_IN ), Gyms ( LOCATED\_IN ) and the connection between Towns and Routes ( GOES\_TO ). All decisions were discussed with team members to refine what was included in the report.
* Sam wrote descriptions and modelled the POKEMON and TYPE entities along with their attributes. Also modelled the relationships POKEMON\_IS\_TYPE, MOVE\_IS\_TYPE, IS\_NOT\_EFF, IS\_NOT\_VRY\_EFF , IS\_SPR\_EFF. He also wrote the description for Pokémon and included in, where it made sense, the connection between MOVE and TYPE. These decisions were discussed with team members and consensus was reached.

**ER Diagram of the Pokémon mini-world**