CS 340 – Final Project - Pokedex

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Website:

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Outline

Pokemon is a game franchise created by Satoshi Tajiri in 1995, and is centered on fictional creatures called "Pokemon", which humans, known as Pokemon Trainers, catch and train to battle each other for sport or to have as pets. It was popularized from the television show in the 90's. There are several different types of Pokemon, ranging from fire to water to plant, just to name a few. Each type has different strengths over other types. Some are also stronger, due to the level of evolution they are on. Pokemon generally have 2-3 forms, each form is considered an evolved form of its predecessor. Pokemon also have different combat moves, some able to do more damage than others. Pokemon of the same kind do not always have identical combat moves.

There's quite a bit of flexibility with the kinds of Pokemon a trainer(human) can have. Essentially they are obtained by catching them with a Pokeball. Once caught, a trainer owns that Pokemon and can strategically use them in combination with others in battle. The first generation of Pokemon that were released had a total of 151 species. There have been more released but we will focus primarily on this first generation. I thought it would be interesting to track this data because I grew up watching the television show and coincidentally thought it was very appropriate given the recent game app that has recently come out, Pokemon Go.

Database Outline In Words

Table: Pokemon

This table holds a sample of the actual original 151 Pokemon species: the Pokemon ID, name and description. The Pokemon ID is not null and not auto-incrementing because the Pokemon in the original game are actually assigned to a specific id – so we want to take the ID from the original game. The primary key for this table is the ID and the unique key is the name.

Table: Type

This table holds the types of Pokemon that exist: Fire, Water, Plant, Bug and Rock. This is a many to many relationship, Pokemon can have many types and many Pokemon can fall under the same type. The type_id is not null and auto incremented because we do not necessarily care

what ID is assigned to what type, therefore, made it auto-increment. The primary key for this table is the type_id and the unique key is the type_name.

Table: Base_hp
This table holds the different Base HP's that a Pokemon can start off at. HP stands for health points, and as mentioned, some Pokemon are stronger than others. This is a one to many relationship. Each Pokemon has one base HP, however, base HP's can be shared by many Pokemon. The basehp_id is not null and auto_incrementing because HP's do not need to be in any particular order, or assigned to any particular ID. The primary key for this table is the basehp_id and the unique key is the hp.

Table: Evolutions
This table holds the number of evolutions left a Pokemon has. Pokemon can take on 2-3 different forms, when they take on a new form, it is said that they "evolved" to another Pokemon. For example, take the Pokemon Squirtle, this is the Pokemon's base form, when it evolves, it turns into Wartortle, then Wartortle evolves into Blastoise. As it evolves it's new form is stronger than its predecessor. This is a one to many relationship. Each Pokemon has one evolution number, whereas an evolution number(or number of evolutions left) can be shared by many Pokemon. The evolution_id is not null and auto incrementing because we do not need care about what ID is assigned to what evolution_number. The primary key for this table is the evolution_id and the unique key is the evolution_number (standing for evolutions left or remaining).

Table: Move
This table holds the move/combat a Pokemon has. Every Pokemon has one move. The same Pokemon does not have to have an identical move, they can be different from each other. This is a one to many relationship. Pokemon can have one move, but a move can be shared by many Pokemon. The attributes in this table are move_id, move_name, description and strength. The move_id attribute is not null and auto incrementing because it doesn't need to be associated with a particular move – this is the primary key of the table. The unique key, is the name. Strength represents the power of the move, meaning some moves can do more damage than others.

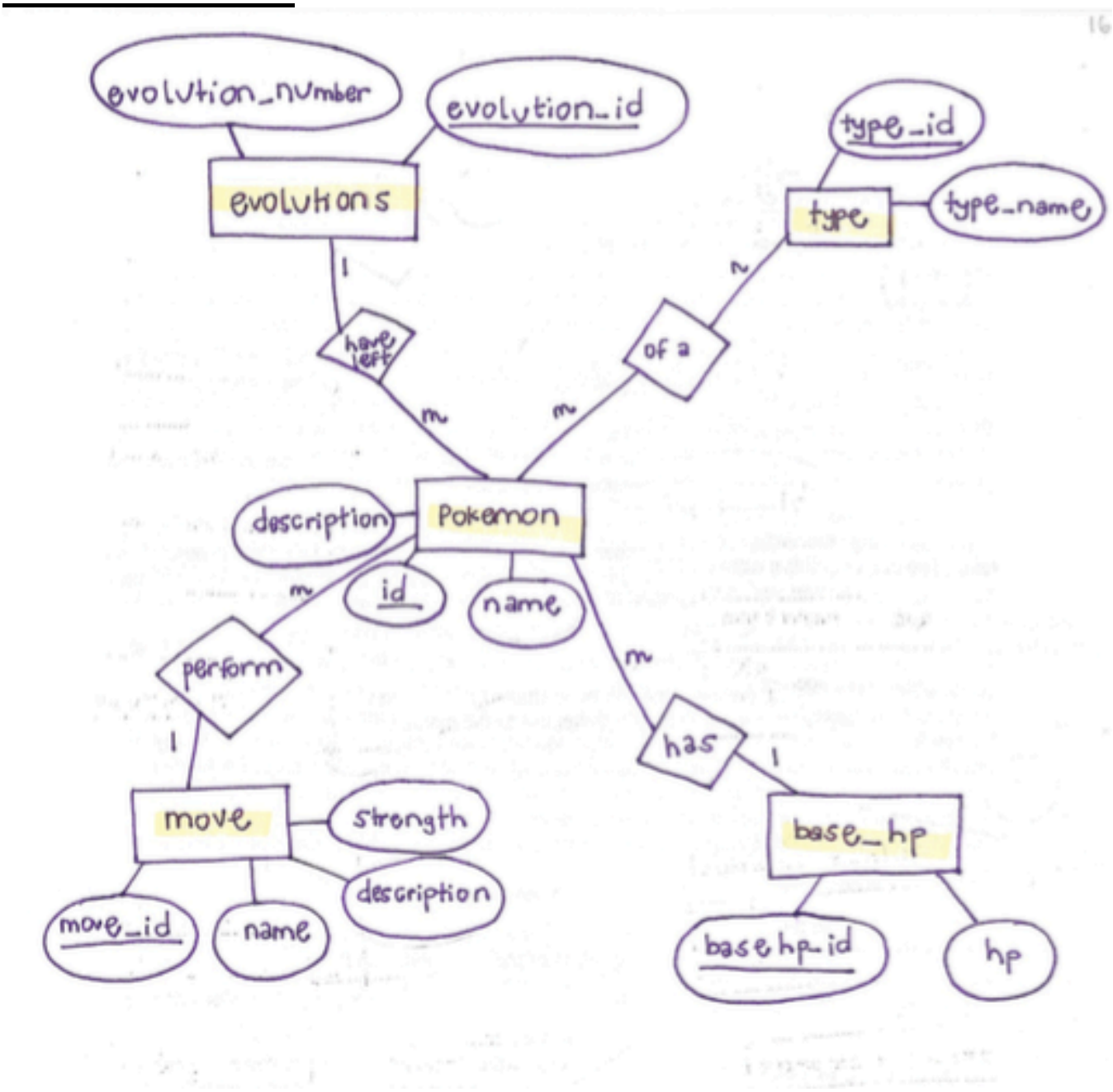
Table: pokemon_type
This table contains pid (Pokemon ID) and tid(Type ID). The pid is the Foreign Key and references id from the Pokemon table. The tid is the Foreign Key and references type_id from the Type table.

Table: pokemon_base
This table contains pid (Pokemon ID) and bid(Base HP ID). The pid is the Foreign Key and references id from the Pokemon table. The bid is the Foreign Key and references basehp_id from the Base_hp table.

Table: pokemon_evolution
This table contains pid (Pokemon ID) and eid(Evolutions ID). The pid is the Foreign Key and references id from the Pokemon table. The eid is the Foreign Key and references evolution_id from the Evolutions table.

Table: pokemon_move
This table contains pid (Pokemon ID) and mid(Move ID). The pid is the Foreign Key and references id from the Pokemon table. The mid is the Foreign Key and references move_id from the Move table.

ER DIAGRAM



DATABASE SCHEMA

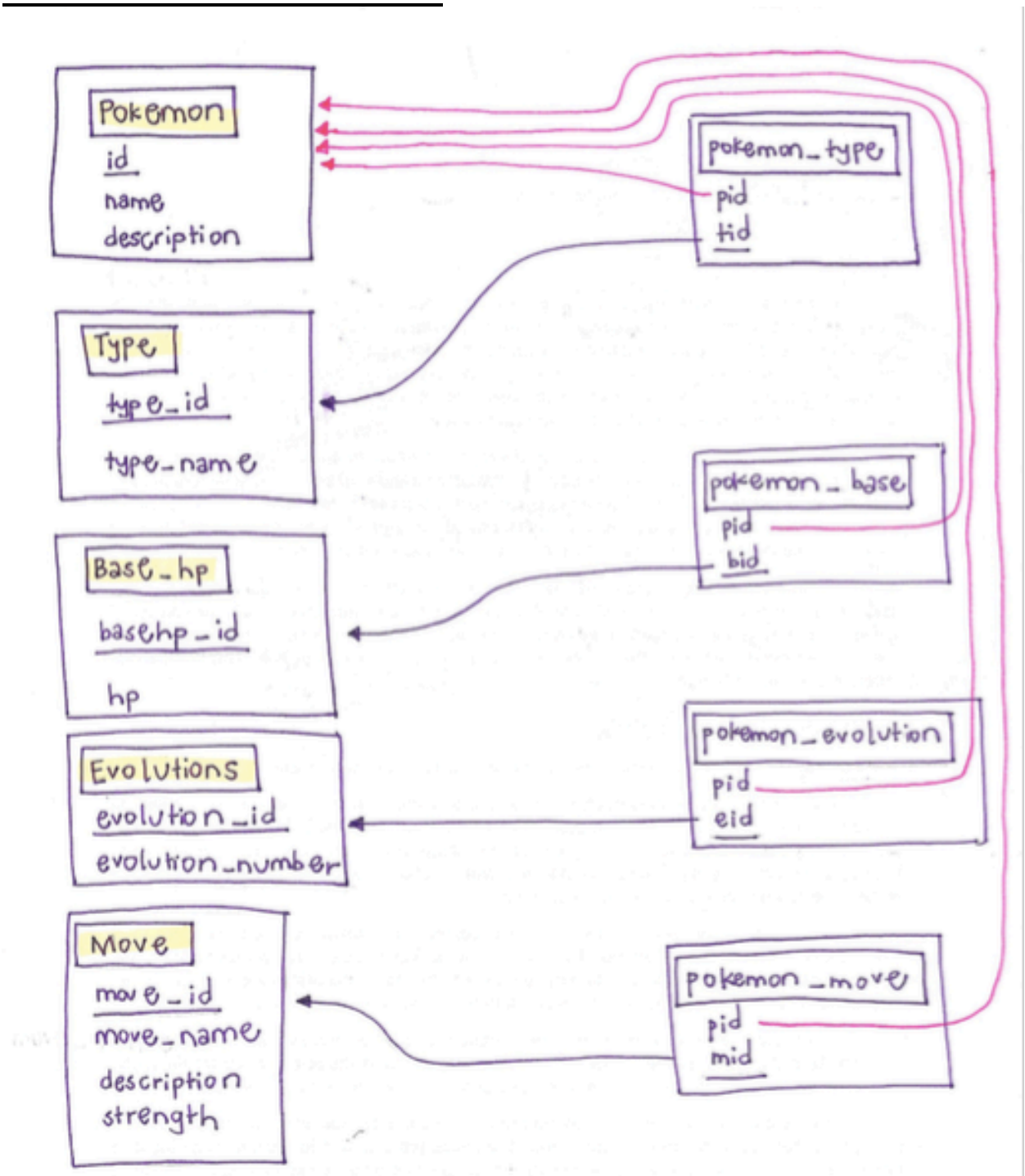


TABLE CREATION QUERIES

```
CREATE TABLE `Pokemon`(
        `id` int(11) NOT NULL AUTO_INCREMENT,
        `name` varchar(255) NOT NULL,
        `description` varchar(255),
        PRIMARY KEY (`id`),
        UNIQUE KEY (`name`)
)ENGINE=InnoDB;


CREATE TABLE `Type`(
        `type_id` int(11) NOT NULL AUTO_INCREMENT,
        `type_name` varchar(255) NOT NULL,
        PRIMARY KEY (`type_id`),
        UNIQUE KEY (`type_name`)
)ENGINE=InnoDB;

CREATE TABLE `Base_hp`(
        `basehp_id` int(11) NOT NULL AUTO_INCREMENT,
        `hp` int(11) NOT NULL,
        PRIMARY KEY (`basehp_id`),
        UNIQUE KEY (`hp`)
)ENGINE=InnoDB;

CREATE TABLE `Evolutions`(
        `evolution_id` int(11) NOT NULL AUTO_INCREMENT,
        `evolution_number` int(11) NOT NULL,
        PRIMARY KEY (`evolution_id`),
        UNIQUE KEY (`evolution_number`)
)ENGINE=InnoDB;

CREATE TABLE `Move` (
        `move_id` int(11) NOT NULL AUTO_INCREMENT,
        `move_name` varchar(255) NOT NULL,
        `description` varchar(255),
        `strength` int(11),
        PRIMARY KEY(`move_id`),
        UNIQUE KEY(`move_name`)
)ENGINE=InnoDB;

CREATE TABLE `pokemon_type` (
        `pid` int(11) NOT NULL,
        `tid` int(11) NOT NULL,
        PRIMARY KEY(`pid`,`tid`),
        FOREIGN KEY (`pid`) REFERENCES `Pokemon`(`id`)
```

```
                ON DELETE CASCADE
                ON UPDATE CASCADE,
        FOREIGN KEY (`tid`) REFERENCES `Type`(`type_id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE `pokemon_base` (
        `pid` int(11) NOT NULL,
        `bid` int(11) NOT NULL,
        PRIMARY KEY(`pid`,`bid`),
        FOREIGN KEY (`pid`) REFERENCES `Pokemon`(`id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE,
        FOREIGN KEY (`bid`) REFERENCES `Base_hp`(`basehp_id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE `pokemon_evolution` (
        `pid` int(11) NOT NULL,
        `eid` int(11) NOT NULL,
        PRIMARY KEY(`pid`,`eid`),
        FOREIGN KEY (`pid`) REFERENCES `Pokemon`(`id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE,
        FOREIGN KEY (`eid`) REFERENCES `Evolutions`(`evolution_id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE
)ENGINE=InnoDB;

CREATE TABLE `pokemon_move` (
        `pid` int(11) NOT NULL,
        `mid` int(11) NOT NULL,
        PRIMARY KEY(`pid`,`mid`),
        FOREIGN KEY (`pid`) REFERENCES `Pokemon`(`id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE,
        FOREIGN KEY (`mid`) REFERENCES `Move`(`move_id`)
                ON DELETE CASCADE
                ON UPDATE CASCADE
)ENGINE=InnoDB;
```

POPULATE TABLES

Pokemon

INSERT INTO Pokemon (id, name, description) VALUES (1, "Bulbasaur", "It can go for days without eating a single morsel. In the bulb on its back, it stores energy.");

INSERT INTO Pokemon (id, name, description) VALUES (2, "Ivysaur", "The bulb on its back grows by drawing energy. It gives off an aroma when it is ready to bloom.");

INSERT INTO Pokemon (id, name, description) VALUES (3, "Venusaur", "The flower on its back catches the sun's rays. The sunlight is then absorbed and used for energy.");

INSERT INTO Pokemon (id, name, description) VALUES (4, "Charmander", "The flame at the tip of its tail makes a sound as it burns. You can only hear it in quiet places.");

INSERT INTO Pokemon (id, name, description) VALUES (5, "Charmeleon", "Tough fights could excite this Pokemon. When excited, it may blow out bluish-white flames.");

INSERT INTO Pokemon (id, name, description) VALUES (6, "Charizard", "When expelling a blast of superhot fire, the red flame at the tip of its tail burns more intensely.");

INSERT INTO Pokemon (id, name, description) VALUES (7, "Squirtle", "Shoots water at prey while in the water. Withdraws into its shell when in danger.");

INSERT INTO Pokemon (id, name, description) VALUES (8, "Wartortle", "When tapped, this Pokemon will pull in its head, but its tail will still stick out a little bit.");

INSERT INTO Pokemon (id, name, description) VALUES (9, "Blastoise", "Once it takes aim at its enemy, it blasts out water with even more force than a fire hose.");

INSERT INTO Pokemon (id, name, description) VALUES (10, "Caterpie", "If you touch the feeler on top of its head, it will release a horrible stink to protect itself.");

INSERT INTO Pokemon (id, name, description) VALUES (11, "Metapod", "Hardens its shell to protect itself. However, a large impact may cause it to pop out of its shell.");

INSERT INTO Pokemon (id, name, description) VALUES (12, "Butterfree", "Its wings, covered with poisonous powders, repel water. This allows it to fly in the rain.");

INSERT INTO Pokemon (id, name, description) VALUES (74, "Geodude", "Commonly found near mountain trails, etc. If you step on one by accident, it gets angry.");

INSERT INTO Pokemon (id, name, description) VALUES (75, "Graveler", "Often seen rolling down mountain trails. Obstacles are just things to roll straight over, not avoid.");

INSERT INTO Pokemon (id, name, description) VALUES (76, "Golem", "Once it sheds its skin, its body turns tender and whitish. Its hide hardens when it's exposed to air.");

Type

INSERT INTO Type (type_name) VALUES ("Plant");
INSERT INTO Type (type_name) VALUES ("Fire");
INSERT INTO Type (type_name) VALUES ("Water");
INSERT INTO Type (type_name) VALUES ("Bug");
INSERT INTO Type (type_name) VALUES ("Rock");

Base_hp

INSERT INTO Base_hp (hp) VALUES (39);
INSERT INTO Base_hp (hp) VALUES (40);
INSERT INTO Base_hp (hp) VALUES (45);
INSERT INTO Base_hp (hp) VALUES (55);
INSERT INTO Base_hp (hp) VALUES (58);
INSERT INTO Base_hp (hp) VALUES (60);
INSERT INTO Base_hp (hp) VALUES (78);
INSERT INTO Base_hp (hp) VALUES (79);
INSERT INTO Base_hp (hp) VALUES (80);

Evolutions

INSERT INTO Evolutions (evolution_number) VALUES (0);
INSERT INTO Evolutions (evolution_number) VALUES (1);
INSERT INTO Evolutions (evolution_number) VALUES (2);

Move

INSERT INTO Move (move_name, description, strength) VALUES ("Vine Whip", "Vine Whip deals damage with no additional effect. ", 45);

INSERT INTO Move (move_name, description, strength) VALUES ("Razor Leaf", "Razor Leaf deals damage and has an increased critical hit ratio (1⁄8 instead of1⁄16). ", 55);

INSERT INTO Move (move_name, description, strength) VALUES ("Petal Dance", "The user of Petal Dance attacks for 2-3 turns, during which it cannot switch out, and then becomes confused. Confused Pokémon have a 50% chance of hurting themselves each turn, for 1-4 turns. The damage received is as if the Pokémon attacks itself with a type-less 40 base power Physical attack.", 120);

INSERT INTO Move (move_name, description, strength) VALUES ("Ember", "Ember deals damage and has a 10% chance of burning the target. ", 40);

INSERT INTO Move (move_name, description, strength) VALUES ("Fire Fang", "Fire Fang deals damage, has a 10% chance of burning the target and has a 10% chance of causing the target to flinch (if the target has not yet moved). ", 65);

INSERT INTO Move (move_name, description, strength) VALUES ("Inferno", "Inferno deals damage and burns the target, if it hits. Burned Pokémon lose 1⁄8 of their maximum HP each turn and their Attack is decreased by 50%.", 100);

INSERT INTO Move (move_name, description, strength) VALUES ("Bubble", "Bubble deals damage and has a 10% chance of lowering the target's Speed by one stage. ", 40);

INSERT INTO Move (move_name, description, strength) VALUES ("Water Pulse", "Water Pulse deals damage and has a 20% chance of confusing the target. ", 60);

INSERT INTO Move (move_name, description, strength) VALUES ("Hydro Pump", "Hydro Pump deals damage with no additional effect.", 110);

INSERT INTO Move (move_name, description, strength) VALUES ("Electroweb", "Electroweb deals damage and lowers the target's Speed by one stage. ", 55);

INSERT INTO Move (move_name, description, strength) VALUES ("Bug Bite", "Bug Bite deals damage, and if the target is holding a Berry, the user eats it and gains its effect. For example, if the target is holding a Sitrus Berry the user will recover 1⁄4 of the its HP. ", 60);

INSERT INTO Move (move_name, description, strength) VALUES ("Bug Buzz", "Bug Buzz deals damage and has a 10% chance of lowering the target's Special Defense by one stage.", 90);

INSERT INTO Move (move_name, description, strength) VALUES ("Rock Throw", "Rock Throw deals damage with no additional effect. ", 50);

INSERT INTO Move (move_name, description, strength) VALUES ("Bulldoze", "Bulldoze deals damage and lowers the target's Speed by one stage. ", 60);

INSERT INTO Move (move_name, description, strength) VALUES ("Earthquake", "Earthquake deals damage, and will hit with double power if the opponent is underground due to the move Dig.", 100);

pokemon_type

INSERT INTO pokemon_type (pid, tid) VALUES (1, 1);
INSERT INTO pokemon_type (pid, tid) VALUES (2, 1);
INSERT INTO pokemon_type (pid, tid) VALUES (3, 1);

INSERT INTO pokemon_type (pid, tid) VALUES (4, 2);
INSERT INTO pokemon_type (pid, tid) VALUES (5, 2);
INSERT INTO pokemon_type (pid, tid) VALUES (6, 2);

INSERT INTO pokemon_type (pid, tid) VALUES (7, 3);

```
INSERT INTO pokemon_type (pid, tid) VALUES (8, 3);
INSERT INTO pokemon_type (pid, tid) VALUES (9, 3);

INSERT INTO pokemon_type (pid, tid) VALUES (10, 4);
INSERT INTO pokemon_type (pid, tid) VALUES (11, 4);
INSERT INTO pokemon_type (pid, tid) VALUES (12, 4);

INSERT INTO pokemon_type (pid, tid) VALUES (74, 5);
INSERT INTO pokemon_type (pid, tid) VALUES (75, 5);
INSERT INTO pokemon_type (pid, tid) VALUES (76, 5);
```

pokemon_base

```
INSERT INTO pokemon_base (pid, bid) VALUES (1, 3);
INSERT INTO pokemon_base (pid, bid) VALUES (2, 6);
INSERT INTO pokemon_base (pid, bid) VALUES (3, 9);

INSERT INTO pokemon_base (pid, bid) VALUES (4, 1);
INSERT INTO pokemon_base (pid, bid) VALUES (5, 5);
INSERT INTO pokemon_base (pid, bid) VALUES (6, 7);

INSERT INTO pokemon_base (pid, bid) VALUES (7, 3);
INSERT INTO pokemon_base (pid, bid) VALUES (8, 5);
INSERT INTO pokemon_base (pid, bid) VALUES (9, 8);

INSERT INTO pokemon_base (pid, bid) VALUES (10, 3);
INSERT INTO pokemon_base (pid, bid) VALUES (11, 3);
INSERT INTO pokemon_base (pid, bid) VALUES (12, 6);

INSERT INTO pokemon_base (pid, bid) VALUES (74, 4);
INSERT INTO pokemon_base (pid, bid) VALUES (75, 4);
INSERT INTO pokemon_base (pid, bid) VALUES (76, 9);
```

pokemon_evolution

```
INSERT INTO pokemon_evolution (pid, eid) VALUES (1, 3);
INSERT INTO pokemon_evolution (pid, eid) VALUES (2, 2);
INSERT INTO pokemon_evolution (pid, eid) VALUES (3, 1);

INSERT INTO pokemon_evolution (pid, eid) VALUES (4, 3);
INSERT INTO pokemon_evolution (pid, eid) VALUES (5, 2);
INSERT INTO pokemon_evolution (pid, eid) VALUES (6, 1);

INSERT INTO pokemon_evolution (pid, eid) VALUES (7, 3);
```

```
INSERT INTO pokemon_evolution (pid, eid) VALUES (8, 2);
INSERT INTO pokemon_evolution (pid, eid) VALUES (9, 1);

INSERT INTO pokemon_evolution (pid, eid) VALUES (10, 3);
INSERT INTO pokemon_evolution (pid, eid) VALUES (11, 2);
INSERT INTO pokemon_evolution (pid, eid) VALUES (12, 1);

INSERT INTO pokemon_evolution (pid, eid) VALUES (74, 3);
INSERT INTO pokemon_evolution (pid, eid) VALUES (75, 2);
INSERT INTO pokemon_evolution (pid, eid) VALUES (76, 1);
```

pokemon_move

```
INSERT INTO pokemon_move (pid, mid) VALUES (1, 1);
INSERT INTO pokemon_move (pid, mid) VALUES (2, 2);
INSERT INTO pokemon_move (pid, mid) VALUES (3, 3);

INSERT INTO pokemon_move (pid, mid) VALUES (4, 4);
INSERT INTO pokemon_move (pid, mid) VALUES (5, 5);
INSERT INTO pokemon_move (pid, mid) VALUES (6, 6);

INSERT INTO pokemon_move (pid, mid) VALUES (7, 7);
INSERT INTO pokemon_move (pid, mid) VALUES (8, 8);
INSERT INTO pokemon_move (pid, mid) VALUES (9, 9);

INSERT INTO pokemon_move (pid, mid) VALUES (10, 10);
INSERT INTO pokemon_move (pid, mid) VALUES (11, 11);
INSERT INTO pokemon_move (pid, mid) VALUES (12, 12);

INSERT INTO pokemon_move (pid, mid) VALUES (74, 13);
INSERT INTO pokemon_move (pid, mid) VALUES (75, 14);
INSERT INTO pokemon_move (pid, mid) VALUES (76, 15);
```

GENERAL USE QUERIES

NOTE: **** [*text*], any text inside these brackets means user selection

```
SELECT Pokemon.id, Pokemon.name, Pokemon.description, Type.type_name, Base_hp.hp,
Evolutions.evolution_number, Move.move_name, Move.description, Move.strength FROM
Pokemon INNER JOIN pokemon_type ON Pokemon.id = pokemon_type.pid INNER JOIN
Type ON pokemon_type.tid = Type.type_id INNER JOIN pokemon_base ON
pokemon_base.pid = Pokemon.id INNER JOIN Base_hp ON Base_hp.basehp_id =
pokemon_base.bid INNER JOIN pokemon_evolution ON pokemon_evolution.pid = Pokemon.id
INNER JOIN Evolutions ON Evolutions.evolution_id = pokemon_evolution.eid INNER JOIN
pokemon_move ON pokemon_move.pid = Pokemon.id INNER JOIN Move ON Move.move_id
= pokemon_move.mid GROUP BY Pokemon.id
```

SELECT * FROM Pokemon

SELECT * FROM Type

SELECT * FROM Base_hp

SELECT * FROM Evolutions

SELECT * FROM Move

SELECT * FROM pokemon_type

SELECT * FROM pokemon_base

SELECT * FROM pokemon_evolution

SELECT * FROM pokemon_move

SELECT Pokemon.id, Pokemon.name, Pokemon.description, Type.type_name, Base_hp.hp, Evolutions.evolution_number, Move.move_name FROM Pokemon INNER JOIN pokemon_type ON Pokemon.id = pokemon_type.pid INNER JOIN Type ON pokemon_type.tid = Type.type_id INNER JOIN pokemon_base ON pokemon_base.pid = Pokemon.id INNER JOIN Base_hp ON Base_hp.basehp_id = pokemon_base.bid INNER JOIN pokemon_evolution ON pokemon_evolution.pid = Pokemon.id INNER JOIN Evolutions ON Evolutions.evolution_id = pokemon_evolution.eid INNER JOIN pokemon_move ON pokemon_move.pid = Pokemon.id INNER JOIN Move ON Move.move_id = pokemon_move.mid WHERE Pokemon.id = [pokemon_id]

SELECT Type.type_name, Pokemon.name FROM Type INNER JOIN pokemon_type ON Type.type_id = pokemon_type.tid INNER JOIN Pokemon ON Pokemon.id = pokemon_type.pid WHERE Type.type_id = [type_id]

SELECT Base_hp.hp, Pokemon.name FROM Base_hp INNER JOIN pokemon_base ON Base_hp.basehp_id = pokemon_base.bid INNER JOIN Pokemon ON Pokemon.id = pokemon_base.pid WHERE Base_hp.basehp_id = [Basehp_id]

SELECT Evolutions.evolution_number, Pokemon.name FROM Evolutions INNER JOIN pokemon_evolution ON Evolutions.evolution_id = pokemon_evolution.eid INNER JOIN Pokemon ON Pokemon.id = pokemon_evolution.pid WHERE Evolutions.evolution_id = [evolution_id]

SELECT Move.move_name, Pokemon.name FROM Move INNER JOIN pokemon_move ON Move.move_id = pokemon_move.mid INNER JOIN Pokemon ON Pokemon.id = pokemon_move.pid WHERE Move.move_id = [move_id]

*/***AGGREGATE FUNCTION USED***/*

```
SELECT COUNT(Pokemon.name) AS count FROM Pokemon INNER JOIN pokemon_type ON Pokemon.id = pokemon_type.pid INNER JOIN Type ON Type.type_id = pokemon_type.tid WHERE Type.type_id = [type_id]

INSERT INTO Base_hp(hp) VALUES ([hp])

INSERT INTO Evolutions(evolution_number) VALUES ([evolution_number])

INSERT INTO Move(move_name, description, strength) VALUES ([move_name],[move_description],[move_strength])

INSERT INTO Pokemon(id, name, description) VALUES ([pokemon_id],[pokemon_name],[description])

INSERT INTO Type(type_name) VALUES ([type_name])

INSERT INTO pokemon_base(pid, bid) VALUES ([pokemon_id],[basehp_id]))

INSERT INTO pokemon_evolution(pid, eid) VALUES ([pokemon_id],[evolution_id]))

INSERT INTO pokemon_move(pid, mid) VALUES ([pokemon_id],[move_id]))

INSERT INTO pokemon_type(pid, tid) VALUES ([pokemon_id],[type_id])
```