CPSC 304 Project Cover Page

Milestone #: 4

Date: November 25th, 2022

Group Number: 51

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia.

Project Description

Our project is a database with the intended function of keeping track of the events in the pokemon television show in terms of what happens with the characters and pokemon. We based our data on the events of the first season of the show which takes place in the Kanto region and has 82 episodes. We represented the events in the show by creating tables for the things we would like to keep track of, for example the pokemon, the characters, who battles who, etc. As we built our project we had to add certain tables in order for everything to work properly together such as PokemonIsOfInstance which allows us to have multiple instances of the same pokemon. We mostly stuck to the idea we had at the start of the project although we have had to make a couple of adjustments along the way. Now that we've completed our project it's safe to say that we've completed our goal. If we were to continue watching the show and entering the data episode by episode we would easily be able to query our database at the end of the show in order to keep track of everything that happens throughout the entire show. We would easily be able to tell anyone interesting facts such as every pokemon that Ash catches throughout the show or how many battles there are in total.

Project Schema:

Our schema differs from our Milestone 2 submission in these few minor ways:

1. We did not use the 3NF decomposition for *Pokemon* and *Gym*. We recognize the implications that this may have on insertion, deletion, and updating; however, we found the benefits of readability outweigh the negatives.

2. *ID* was added to the relation for *heals*. This information can be useful in this table and can help simplify queries for specific pokemon.

3. The table *Character* was changed to *showCharacter* to avoid being confused with the SQL keyword of the same name.

4. *Category* was removed as an attribute from *Pokemon* as we deemed it irrelevant.

List of Tables:

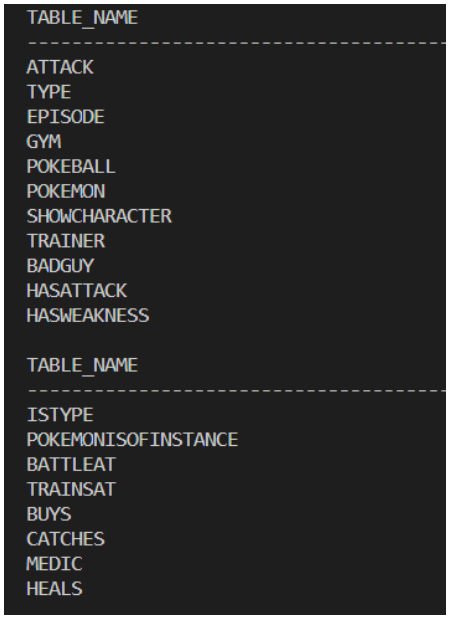


Table Schema:

Pokemon (<u>id</u>, height, weight, PName, size)

isType (**<u>id</u>**, <u>TName</u>)

type(<u>TName</u>)

hasWeakness (**<u>id</u>**, <u>TName</u>)

pokemonIsOfInstance (**id**, instanceNum, isKnockedOut)

Catches (**instanceNum**, **CName**, **EpisodeNumber**, **PType**)

ASSUMPTION: no pokemon gets caught more than once

Episode (*title*, EpisodeNumber)

Gym (Gname, location, region)

showCharacter (Cname, age)

ASSUMPTION: everyone's name is unique

Trainer (**Cname**, starterPokemon)

BadGuy(**Cname**, Affiliation)

Medic(**Cname**, Hospital)

Pokeball(PType)

Heals (**CName**, **id**, **instanceNum**, **EpisodeNumber**)

Buys(**PType**, **EpisodeNumber**, **Cname**)

TrainsAt(**Cname**, **EpisodeNumber**, **Gname**)

BattleAt(**TrainerName**, **BadGuyName**, **Gname**, **EpisodeNumber**)

HasAttack(**AttackName**, **id**)

Attack(AttackName, Type, Damage)

Example Tuples after Script Execution:

Attack:

```
SQL> SELECT * FROM attack;

ATTACKNAME           TYPE                    DAMAGE
-------------------- -------------------- ----------
Gust                 Flying                       40
Sand Attack          Ground                        0
Horn Attack          Normal                       65
Tackle               Normal                       40
Peck                 Flying                       35
Thunder Shock        Electric                     40
Hypnosis             Psychic                       0
Flamethrower         Fire                         90
Bug Bite             Bug                          60
Struggle             Normal                       50
Bite                 Dark                         60
```

Type:

```
SQL> SELECT * FROM type;

TNAME
--------------------
Bug
Dark
Dragon
Electric
Fairy
Fighting
Fire
Flying
Ghost
Grass
Ground
```

Episode:

```
SQL> SELECT * FROM Episode;

TITLE                                EPISODENUMBER
------------------------------------ -------------
Pokemon I Choose You!                            1
Pokemon Emergency!                               2
Ash Catches a Pokemon                            3
Challenge of the Samurai                         4
Showdown in Pewter City                          5
Clefairy and the Moon Stone                      6
The Water Flowers of Cerulean City               7
The Path to the Pokemon League                   8
The School of Hard Knocks                        9
Bulbasaur and the Hidden Village                10
Charmander - The Stray Pokemon                  11
```

Gym:

```
SQL> SELECT * FROM GYM;

GNAME              LOCATION           REGION
------------------ ------------------ ----------
Pewter City Gym    Pewter City        Kanto
Cerulean City Gym  Cerulean City      Kanto
Vermilion City Gym Vermilion City     Kanto
Celadon City Gym   Celadon City       Kanto
Fuchsia City Gym   Fuchsia City       Kanto
Saffron City Gym   Saffron City       Kanto
Cinnabar Island Gym Cinnabar Island   Kanto
Seafoam Islands Gym Seafoam Islands   Kanto
Viridian City Gym  Viridian City      Kanto
```

Pokeball:

```
SQL> SELECT * FROM Pokeball;

PTYPE
--------------------
Beast Ball
Cherish Ball
Dive Ball
Dream Ball
Dusk Ball
Fast Ball
Friend Ball
Great Ball
Heal Ball
Heavy Ball
Level Ball
```

Pokemon:

```
SQL> SELECT * FROM Pokemon;

        ID     HEIGHT     WEIGHT PNAME                PSIZE
---------- ---------- ---------- -------------------- ----------
         1          1          7 Bulbasaur            SMALL
         2          1         13 Ivysaur              SMALL
         3          2        100 Venusaur             LARGE
         4          1          9 Charmander           SMALL
         5          1         19 Charmeleon           MEDIUM
         6          2         91 Charizard            LARGE
         7          1          9 Squirtle             SMALL
         8          1         23 Wartortle            MEDIUM
         9          2         86 Blastoise            LARGE
        10          0          3 Caterpie             SMALL
        11          1         10 Metapod              SMALL
```

ShowCharacter:

```
SQL> SELECT * FROM Showcharacter;

CNAME                       AGE
-------------------- ----------
Ella                         12
Ash                          10
Jenna                        13
Gabriella                    14
Taylor                       15
Rihanna                      16
Chris                        22
Matt                         45
Jeffrey                      54
Alice                        12
Jenkins                      23
```

Trainer:

```
SQL> SELECT * FROM Trainer;

CNAME                     AGE
------------------- ----------
Tyrone                     12
Tyreese                    13
Daquan                     14
Charlise                   15
Abneet                     16
Ash                        10
Misty                      10
Ritchie                    10
Jessie                     10
James                      10
Professor Oak              40
```

BadGuy:

```
SQL> SELECT * FROM BadGuy;

CNAME               AFFILIATION
------------------- -------------------
Katie               Rocket
Danae               Aqua
Holly               Galactic
Erin                Rocket
Amanda              Plasma
Brock               Pewter
Gary                Viridian
Lt. Surge           Vermilion
Sabrina             Saffron
Erika               Celadon
Koga                Fuschia
```

HasAttack:

```
SQL> SELECT * FROM HasAttack;

ATTACKNAME                ID
------------------- ----------
Gust                      12
Gust                      16
Gust                      17
Gust                      18
Gust                      41
Gust                      42
Gust                      49
Gust                     144
Gust                     146
Sand Attack               16
Sand Attack               17
```

HasWeakness:

```
SQL> SELECT * FROM hasWeakness;

        ID TNAME
---------- --------------------
         1 Fire
         2 Fire
         3 Fire
         4 Water
         5 Water
         6 Water
         7 Electric
         8 Electric
         9 Electric
        10 Fire
        11 Fire
```

IsType:

```
SQL> SELECT * FROM isType;

        ID TNAME
---------- --------------------
         1 Grass
         1 Poison
         2 Grass
         2 Poison
         3 Grass
         3 Poison
         4 Fire
         5 Fire
         6 Fire
         6 Flying
         7 Water
```

PokemonIsOfInstance:

```
SQL> SELECT * FROM Pokemonisofinstance;

        ID INSTANCENUM ISKNO
---------- ----------- -----
        25          39 no
        10          40 no
        17          41 no
        41          42 no
         1          43 no
         4          44 no
        98          45 no
       116          46 no
        57          47 no
        54          48 no
        89          49 no
```

BattleAt:

```
SQL> SELECT * FROM BattleAt;

CNAMET               CNAMEB               GNAME               EPISODENUMBER
-------------------- -------------------- -------------------- -------------
Ash                  Blaine               Cinnabar Island Gym             67
Ash                  Brock                Pewter City Gym                  5
Ash                  Erika                Celadon City Gym                26
Ash                  Koga                 Fuchsia City Gym                32
Ash                  Lt. Surge            Vermilion City Gym              14
Ash                  Sabrina              Saffron City Gym                22
```

TrainsAt:

```
SQL> SELECT * FROM trainsAt;

CNAME                EPISODENUMBER GNAME
-------------------- ------------- --------------------
Ash                              5 Pewter City Gym
Ash                             14 Vermilion City Gym
Ash                             22 Saffron City Gym
Ash                             50 Cinnabar Island Gym
Ash                             59 Cinnabar Island Gym
Brock                           50 Cinnabar Island Gym
Misty                           50 Cinnabar Island Gym
```

Buys:

```
SQL> SELECT * FROM Buys;

PTYPE                EPISODENUMBER CNAME
-------------------- ------------- ------------
Fast Ball                       81 Abneet
Poke Ball                        1 Ash
Safari Ball                     35 Ash
Timer Ball                      82 Daquan
Love Ball                       80 Tyreese
Luxury Ball                     79 Tyrone
```

Catches:

```
SQL> SELECT * FROM catches;

INSTANCENUM CNAME                EPISODENUMBER PTYPE
----------- -------------------- ------------- --------------------
          1 Ash                              3 Poke Ball
          1 Ash                              4 Poke Ball
          1 Ash                              5 Poke Ball
          1 Ash                             10 Poke Ball
          1 Ash                             11 Poke Ball
          1 Ash                             13 Poke Ball
          1 Ash                             25 Poke Ball
          1 Ash                             30 Poke Ball
          1 Ash                             35 Poke Ball
          1 Brock                            6 Poke Ball
          1 Bruno                           71 Poke Ball
```

Medic:

```
SQL> SELECT * FROM medic;

CNAME                HOSPITAL
-------------------- ------------
Chris                Hospital6
Matt                 Hospital2
Jeffrey              Hospital3
Alice                Hospital4
Jenkins              Hospital5
Joy                  Hospital1
```

Heals:

```
SQL> SELECT * FROM heals;

CNAME                INSTANCENUM         ID EPISODENUMBER
-------------------- ----------- ---------- -------------
Joy                            1         25            82
Joy                           34        147            82
Joy                           35        148            82
Joy                           36        149            82
Joy                           37        150            82
Joy                           38        151            82
```

SQL Queries

Insert

Before

145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Mew	10	10	TINY

Insert into Pokemon(id,height,weight,Pname,Psize) value (152, Group 51, 10, 10, LARGE)

145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Mew	10	10	TINY
152	Group 51	10	10	LARGE

DELETE

Before

145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Mew	10	10	TINY
152	Group 51	10	10	LARGE

Delete from Pokemon where id = 152

145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Mew	10	10	TINY

Update

Before

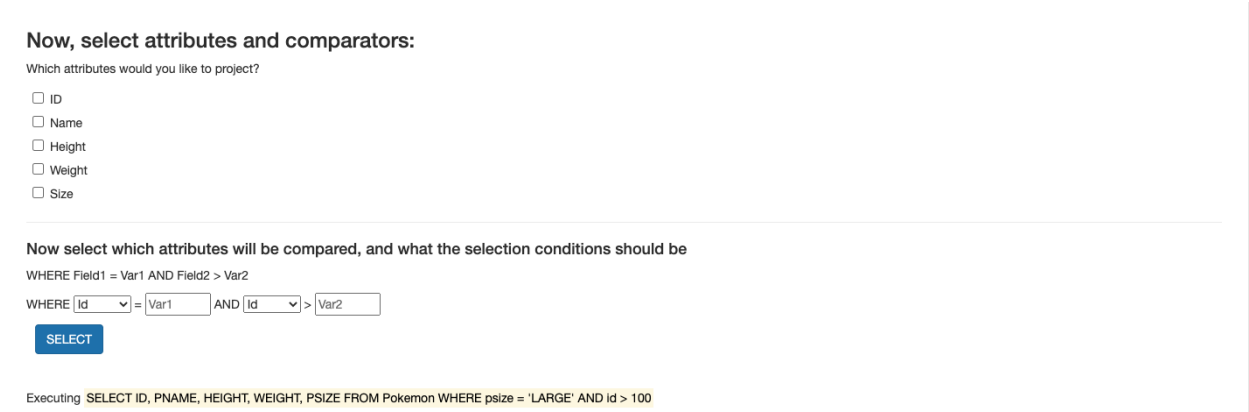
145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Mew	10	10	TINY

update Pokemon set pname = “Updated Name”, height = 100, weight = 100, psize = “TINY” where id = 151

145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
147	Dratini	2	3	SMALL
148	Dragonair	4	17	MEDIUM
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
151	Updated Name	100	100	TINY

Selection - Pokemon

SELECT ID, PNAME, HEIGHT, WEIGHT, PSIZE FROM Pokemon WHERE psize = 'LARGE' AND id > 100



Retrieved data from table Pokemon:

ID	PNAME	HEIGHT	WEIGHT	PSIZE
103	Exeggutor	2	120	LARGE
111	Rhyhorn	1	115	LARGE
112	Rhydon	2	120	LARGE
115	Kangaskhan	2	80	LARGE
121	Starmie	1	80	LARGE
123	Scyther	2	56	LARGE
127	Pinsir	2	55	LARGE
128	Tauros	1	88	LARGE
130	Gyarados	7	235	LARGE
131	Lapras	3	220	LARGE
142	Aerodactyl	2	59	LARGE
143	Snorlax	2	460	LARGE
144	Articuno	2	55	LARGE
145	Zapdos	2	53	LARGE
146	Moltres	2	60	LARGE
149	Dragonite	2	210	LARGE
150	Mewtwo	2	122	LARGE
152	Group 51	10	10	LARGE

Selection - isType

SELECT ID, TName FROM isType WHERE Tname = 'Grass'

Now select the attributes and compartors:

Which attributes would you like to project?

- [ ] ID
- [ ] Type

Now select which attributes will be compared, and what the selection conditions should be

WHERE Field1 Opp1 Var1

Id = Var1

getTable

Executing `SELECT ID, TName FROM isType WHERE Tname = 'Grass'`

Retrieved data from table isType:

ID	TName
1	Grass
2	Grass
3	Grass
43	Grass
44	Grass
45	Grass
46	Grass
47	Grass
69	Grass
70	Grass
71	Grass
102	Grass
103	Grass
114	Grass

Selection - Attack

SELECT AttackName, Type, Damage FROM Attack WHERE damage < 50 OR damage > 80

Now select the attributes and compartors:

Which attributes would you like to project?

- [ ] Attack Name
- [ ] Type
- [ ] Damage

Now select which attributes will be compared, and what the selection conditions should be

WHERE Field1 Opp1 Var1 OR Field2 Opp2 Var2

WHERE Attack Name = Var1 OR Damage = Var2

getTable

Executing SELECT AttackName, Type, Damage FROM Attack WHERE damage < 50 OR damage > 80

Retrieved data from table isType:

AttackName	Type	Damage
Gust	Flying	40
Sand Attack	Ground	0
Tackle	Normal	40
Peck	Flying	35
Thunder Shock	Electric	40
Hypnosis	Psychic	0
Flamethrower	Fire	90
Sing	Normal	0
Spore	Grass	0
Thrash	Normal	120
Teleport	Psychic	0
Swords Dance	Normal	0
Transform	Normal	0

Projection

SELECT ID, PNAME, HEIGHT, WEIGHT, PSIZE FROM Pokemon

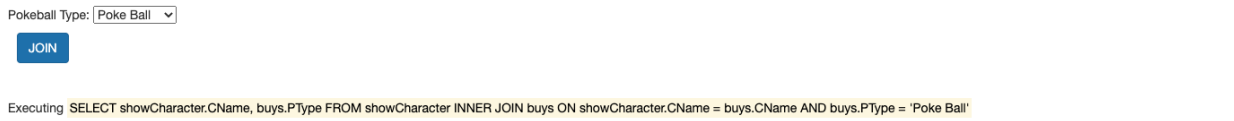
Retrieved data from table Pokemon:

ID	PNAME	HEIGHT	WEIGHT	PSIZE
1	Bulbasaur	1	7	SMALL
2	Ivysaur	1	13	SMALL
3	Venusaur	2	100	LARGE
4	Charmander	1	9	SMALL
5	Charmeleon	1	19	MEDIUM
6	Charizard	2	91	LARGE
7	Squirtle	1	9	SMALL
8	Wartortle	1	23	MEDIUM
9	Blastoise	2	86	LARGE
10	Caterpie	0	3	SMALL
11	Metapod	1	10	SMALL
12	Butterfree	1	32	MEDIUM
13	Weedle	0	3	SMALL
14	Kakuna	1	10	SMALL
15	Beedrill	1	30	MEDIUM
16	Pidgey	0	2	SMALL
17	Pidgeotto	1	30	MEDIUM
18	Pidgeot	2	40	MEDIUM
19	Rattata	0	4	SMALL
20	Raticate	1	18	SMALL
21	Spearow	0	2	SMALL
22	Fearow	1	38	MEDIUM
23	Ekans	2	7	SMALL
24	Arbok	4	65	LARGE
25	Pikachu	0	6	SMALL
26	Raichu	1	30	MEDIUM
27	Sandshrew	1	12	SMALL
28	Sandslash	1	30	MEDIUM
29	Nidoran F	0	7	SMALL
30	Nidorina	1	20	MEDIUM
31	Nidoqueen	1	60	MEDIUM
32	Nidoran M	1	9	SMALL

[Results continue to row 151]

Join

SELECT showCharacter.CName, buys.PType FROM showCharacter INNER JOIN buys ON showCharacter.CName = buys.CName AND buys.PType = 'Poke Ball'



Retrieved data from table isType:

showCharacter.CName	buys.PType
Ash	Poke Ball
Tyreese	Poke Ball

Division

```
SELECT Pname
FROM Pokemon P
WHERE NOT EXISTS (
    SELECT T.TName
    FROM type T
    WHERE (T.TName = 'Grass' OR T.TName = 'Poison') AND NOT EXISTS (
        SELECT I.id
        FROM isType I
        WHERE I.id = P.id AND T.TName = I.TName))
```

Selects all pokemon with types Grass and Poison

```
SELECT Pname
FROM Pokemon P
WHERE NOT EXISTS (
    SELECT T.TName
    FROM type T
    WHERE (T.TName = 'Grass' OR T.TName = 'Poison') AND NOT EXISTS (
        SELECT I.id
        FROM isType I
        WHERE I.id = P.id AND T.TName = I.TName))
```

DIVIDE

Retrieved data from table Pokemon:

Pname
Bulbasaur
Ivysaur
Venusaur
Oddish
Gloom
Vileplume
Bellsprout
Weepinbell
Victreebel

Aggregation - Group-By

```
SELECT Pokemon.Psize, max(height)
FROM Pokemon
GROUP BY Pokemon.Psize;
```

Selects the name and height of pokemon with tallest height of its size

```
SELECT Pokemon.Psize, max(height)
FROM Pokemon
GROUP BY Pokemon.Psize;
```

SELECT

Retrieved data from table Pokemon:

Psize	height
SMALL	2
MEDIUM	4
LARGE	10
TINY	100

Aggregation - Having

```
SELECT TName, Count(Tname)
FROM isType
GROUP BY TName
HAVING COUNT(TName) > 20;
```

Select Type Names where > 20 pokemon have type

```
SELECT TName, Count(Tname)
FROM isType
GROUP BY TName
HAVING COUNT(TName) > 20;
```

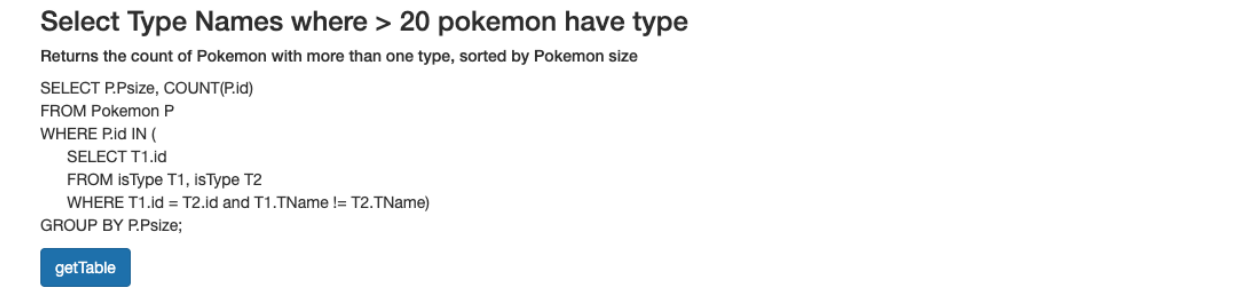
SELECT

Retrieved data from table isType:

Id	Count(Tname)
Poison	33
Normal	22
Water	32

Aggregation - Nested Group-By

```
SELECT P.Psize, COUNT(P.id)
FROM Pokemon P
WHERE P.id IN (
    SELECT T1.id
    FROM isType T1, isType T2
    WHERE T1.id = T2.id and T1.TName != T2.TName)
GROUP BY P.Psize;
```



Retrieved data from table Pokemon:

P.Psize	Count(P.id)
SMALL	22
MEDIUM	21
LARGE	25

Citations

1. The general structure of most `.php` files is inspired by the `oracle-test.php` file provided for CPSC 304 Tutorial 7. In particular, the following methods feature code from `oracle-test.php`:
    a. `debugAlertMessage()`
    b. `executePlainSQL()`
    c. `executeBoundSQL()`
    d. `connectToDB()`
    e. `disconnectFromDB()`
    f. `handle[SQL-statement]Request()`
    g. `handlePostRequest()`
    h. `printResult()`
    i. `handleGetRequest()`
2. Bootstrap was used throughout the project for HTML and CSS