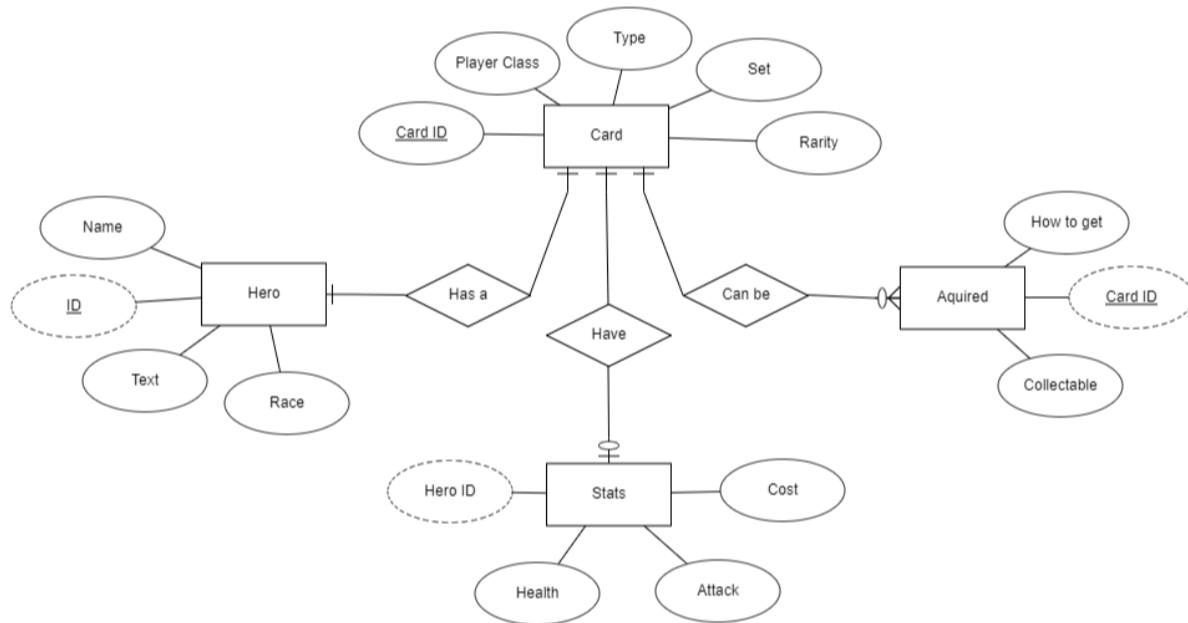


Jorden Hanford
DB Management Systems 2022
Final Project Write-Up

DB Final Write-Up

Schema Modifications:



For my database I had to make a slight change to the schema to simplify its creation where instead of the Stats table having a relationship with the Hero table I decided to change the relationship to be with the Cards table so there would be no need to add another table as a key table.

Create Table Statements:

Cards Table

```
spr2022bdb18=> CREATE TABLE cards (card_id SERIAL, player_class varchar(50), type varchar(50), set varchar(50), rarity varchar(50), PRIMARY KEY (card_id));
CREATE TABLE
```

```
CREATE TABLE cards (card_id SERIAL, player_class varchar(50), type varchar(50),  
set varchar(50), rarity varchar(50), PRIMARY KEY (card_id));
```

Heroes Table

```
spr2022bdb18=> CREATE TABLE heroes(hero_id SERIAL, name varchar(50), text varchar(150), race varchar(20), FOREIGN KEY (hero_id) REFERENCES cards(card_id));
CREATE TABLE
```

CREATE TABLE heroes (hero_id SERIAL, name varchar(50), text varchar(150), race varchar(50), FOREIGN KEY (hero_id) REFERENCES cards (card_id));

Stats Table

```
spr2022bdb18=> CREATE TABLE stats(hero_id SERIAL, health int, attack int, cost int, FOREIGN KEY (hero_id) REFERENCES cards(card_id));
CREATE TABLE
spr2022bdb18=> \COPY cards(player class, type, set, rarity) FROM '/u/jhanford/cardcsv/dbcards.csv' WITH (FORMAT CSV, NULL 'NULL', DELIM
```

CREATE TABLE stats (hero_id SERIAL, health int, attack int, cost int, FOREIGN KEY (hero_id) REFERENCES cards (card_id));

Acquired Table

```
spr2022bdb18=> CREATE TABLE aquired(card_id SERIAL, how_to_earn varchar(100), collectible boolean, FOREIGN KEY (card_id) REFERENCES cards(card_id));
CREATE TABLE
spr2022bdb18=> \COPY aquired(how to earn, collectible) FROM '/u/jhanford/cardcsv/dbacquired.csv' WITH (FORMAT CSV, NULL 'NULL', DELIMITER ',', HEADER
```

CREATE TABLE acquired (card_id SERIAL, how_to_earn varchar(100), collectible boolean, FOREIGN KEY (card_id) REFERENCES cards (card_id));

Database Population:

To populate my database I ended up splitting the original dataset csv file into separate csv's that contained the desired information for each table, then ported them over using an SFTP service to add them to my linux system. Then going into postgres using the \copy statement to copy the contents of the csv files into their respective tables.

1) How many entries are there in the dataset?

SELECT COUNT(*) FROM cards;

```
spr2022bdb18=> select count(*) from cards;
   count
-----
    799
(1 row)
```

2) How many different player classes are there?

```
SELECT COUNT(Distinct (player_class)) from cards;
```

```
spr2022bdb18=> select count(distinct (player_class)) from cards;
  count
-----
    12
(1 row)
```

3) Which player class occurs the most?

```
SELECT mode() WITHIN GROUP (ORDER BY player_class) from cards;
```

```
spr2022bdb18=> SELECT mode() WITHIN GROUP (ORDER BY player_class) from cards;
  mode
-----
 NEUTRAL
(1 row)
```

4) Which card has the highest durability? (CHANGED durability is not an attribute of the table.)

4) How many MAGE class cards are there?

```
SELECT count(player_class) FROM cards WHERE player_class='MAGE';
```

```
spr2022bdb18=> select count(player_class) from cards where player_class='MAGE';
  count
-----
    24
(1 row)
```

5) Are there any duplicate cards?

```
SELECT DISTINCT * FROM heroes WHERE name in ( SELECT name FROM (
SELECT name, count(*) FROM heroes GROUP BY name HAVING count(*) > 1) as
dups);
```

hero_id	name	text	RACE
538	Silverware Golem	+1/+1 from Trogg Beastrager.	
178	Smugglina	Add a random Demon to your hand.	
793	Shadow Oil	Hero Power	+
767	Harvest	Draw a card. Gain a Mana Crystal.	
553	Living Bomb	Choose an enemy minion. If it lives until your next turn, deal 5 damage to all enemies.	
683	Druid of the Claw	Charge On! Charge; or +2 Health and Faunt.	
177	Ley Lines	Passive Hero Power Both players have Spell Damage +3.	+
388	Goldthorn	Give your minions +6 Health.	
99	Gluth		
719	Fate	Deathrattle: Your owner gets a banana.	
266	Jade Golem	Increased stats.	
492	Darkness Calls	Both players have Spell Damage +5.	
680	Decimate	Hero Power	+
633	Prince Malchezaar	Change the Health of enemy minions to 1.	
713	Razorgore the Untamed		DEMON
278	Cleave	Deal 4 damage to a minion and its owner.	
647	Decimate	Health changed to 1.	
330	Atiesh	After you cast a spell, summon a random minion of that cost.	+
		Lose 1 Durability.	+
358	Jade Golem	+2 Attack	
57	Enraged	Passive Hero Power	
597	Trogg Hate Minions!	Enemy minions cost (2) more. Swap at the start of your turn.	+
52	Preparation	The next spell you cast this turn costs (3) less.	
696	Ley Lines	Passive Hero Power	+
		Both players have Spell Damage +5.	+
550	Equipped	+1 Attack.	
222	Ancient Power	Hero Power	+
		Give each player a random card. It costs (0).	+
164	Hungry Naga		
3	Druid of the Flame	This minion has +1/+1. (+1 Attack/+1 Health)	BEAST
275	Bananas	+4 Health and Faunt.	
644	Mark of Nature	Deathrattle: Place a copy of this card in your deck.	
764	Hell Bovine	Deathrattle: The next spell you cast this turn costs (3) less.	DEMON
798	Preparation		
37	Eruption	Hero Power	+
		Deal 2 damage to the left-most enemy minion.	+
402	Cleave	Deal 7 damage to a minion and its owner.	
781	Doppelgangster	Battlecry: Summon 2 copies of this minion.	
773	Shadow Oil	Add 2 random Demons to your hand.	

259	Black King		
187	Gluth		
423	Shaky Spirit	Double a minion's Health.	
380	Goldthorn	+6 Health.	
115	Rafam		
181	Medivh		
298	The Majordomo	Hero Power	+
		Summon a 3/3 Flamewaker Acolyte.	
520	Smugglina	Increased stats from Brass Knuckles.	
44	Ice Block	Your hero is Immune this turn.	
314	Open the Gates	Hero Power	+
		Summon three 1/1 Whelps.	+
610	Fate	Deathrattle: random card in owner's hand costs (0).	
513	Hell Bovine	Deathrattle: Place a copy of this card in your deck.	
717	Staff of Origination	Add a random legendary minion to your hand. It costs (4) less.	DEMON
671	Armor Plating	+1 Health.	
167	Lord Slitherspear	At the end of your turn, summon 1/1 Hungry Naga for each enemy minion.	
690	Ice Block Plating	Give a minion +1 Health.	
769	Dark Wispers	+5/+5 and Faunt.	
728	Famished	Quite Hungry.	
581	Blessing of Might	Give a minion +3Attack.	
48	Archaedas	Quite Hungry.	
149	Famished	Quite Hungry.	
140	Smuggling	+2/+2 from Shaky Zipgunner.	
134	Jade Idol	Summon a(1) (0) Jade Golem.	
230	Dark Wispers	+5/+5 and Faunt.	
491	Darkness Calls	Summon two random Naxxramas bosses and trigger their Battlecries.	
635	Worshipper	Your hero has +3 Attack on your turn.	
63	Equipped	Increased Attack.	
79	Prince Malchezaar		
601	Lord Strathurus Rex		
123	Hungry Naga		
389	Lord Slitherspear		
336	Razorgore the Untamed	At the end of your turn, summon 1/1 Hungry Naga for each enemy minion.	
258	Bananas	Has +1/+1.	
505	Jade Golem		
486	Boom Bot		
488	Druid of the Fang	Battlecry: If you have a Beast, transform this minion into a 7/7.	
531	Rafam		
507	Ancient Power	Hero Power	+
		Add a random card to your hand. It costs (0).	+
480	Ice Block	Secret: When your hero takes fatal damage, prevent it and become Immune this turn.	
31	Jade Golem		
132	Trogg Hate Minions!	Passive Hero Power	+
13		Enemy minions cost (1). Swap at the start of your turn.	+
15	Smuggling	+2/+2 from Smuggler's Crate.	
755	Prince Malchezaar		
122	Big Banana	Give a minion +2/+2.	

adacs.pdx.edu - PuTTY			
122 Big Banana	Give a minion +2/+2.		
86 Blessing of Might	+3 Attack.	+	
225 Staff of Origination	Passive Hero Power		
	Your hero is Immune.		
735 Worshipper	Your hero has +1 Attack on your turn.		
534 Troll Hate Minions!	Passive Hero Power	+	
	Enemy minions cost (11). Swap at the start of your turn.		
440 Doppelgangster	Battlecry: Summon 2 copies of this minion.		
95 Jade Idol	Choose One - Summon all (0) Jade Golem; or Shuffle 3 copies of this card into your deck.		
602 Tank Mode	+1 Health.		
216 Boom Bot	Deathrattle: Deal 1-4 damage to a random enemy.	MECHANICAL	
248 Sun Raider Phaerix	Your other minions are Immune.		
733 Onyxia	Battlecry: Summon 1/1 Whelps until your side of the battlefield is full.	DRAGON	
10 Harvest	Hero Power	+	
	Draw a card. Gain a Mana Crystal.		
173 Divine Spirit	This minion has double Health.		
546 Medivh			
711 Sun Raider Phaerix			
722 Open the Gates	Hero Power	+	
	Summon three 2/2 Whelps. Get a new Hero Power.		
408 Enraged	+2 Attack.		
144 Druid of the Claw	Taunt.	BEAST	
35 The Majordomo	Hero Power	+	
	Summon a 1/3 Flamewaker Acolyte.		
152 Burning Adrenaline	Costs (2) less.		
118 Archaedas	At the end of your turn, turn a random enemy minion into a 0/2 Statue.		
617 Onyxia			
588 Druid of the Flame			
376 Living Bomb	Choose an enemy minion. If it lives until your next turn, deal 5 damage to all enemies.		
631 Jade Golem			
671 Mark of Nature			
559 Jade Golem			
615 Atiesh	This minion has +4 Health and Taunt.		
	After you cast a spell,	+	
	summon a random	+	
	minion of that cost.	+	
	Immortal Ability.		
201 Bananas	Give a friendly minion +1/+1. (+1 Attack/+1 Health)		
689 Tank Mode	+1 Health.		
362 Skeleasaurus Rex	At the end of your turn, give each player a random card. It costs (0).		
241 Eruption	Hero Power	+	
	Deal 3 damage to the left-most enemy minion.		
574 Burning Adrenaline	Deal 2 damage to the enemy hero.		
675 Druid of the Fang			
640 Fate	Deathrattle: Your owner gets a coin.		
508 Black King			
357 Silverware Golem			
117 Big Banana	Has +2/+2.		
(117 rows)			

6) What is the highest health card?

SELECT MAX(health) from stats;

```
spr2022bdb18=> select max(health) from stats;
max
-----
100
(1 row)
```

7) What is the avg health of all cards?

SELECT AVG(health) FROM stats;

```
spr2022bdb18=> SELECT AVG(health) FROM stats;
avg
-----
7.5051282051282051
(1 row)
```

8) What is the avg cost of playing a card?

```
SELECT AVG(cost) FROM stats;
```

```
|spr2022bdb18=> SELECT AVG(cost) FROM stats;
|          avg
|-----
|      2.9920382165605096
|(1 row)
```

9) What is the highest attack card?

```
SELECT MAX(attack) FROM stats;
```

```
|spr2022bdb18=> SELECT MAX(attack) FROM stats;
|max
|-----
|      25
|(1 row)
```

10) What is the highest cost card?

```
SELECT MAX(cost) FROM stats;
```

```
|spr2022bdb18=> SELECT MAX(cost) FROM stats;
|max
|-----
|      12
|(1 row)
```

11) How many unique card sets are there?

```
SELECT COUNT(DISTINCT (set)) FROM cards;
```

```
|spr2022bdb18=> SELECT COUNT(DISTINCT (set)) FROM cards;
|count
|-----
|      16
|(1 row)
```

12) How many different races are there?

```
SELECT COUNT(DISTINCT (race)) FROM heroes;
```

```
spr2022bdb18=> SELECT COUNT(DISTINCT (race)) FROM heroes;
  count
-----
      6
(1 row)
```

13) Which cards are collectible?

```
SELECT * FROM aquired;
```

See aquired_querey.txt for results.

14) Are there more common, rare, epic, or legendary cards?

```
SELECT mode() WITHIN GROUP (ORDER BY rarity) from cards;
```

```
spr2022bdb18=> SELECT mode() WITHIN GROUP (ORDER BY rarity) from cards;
  mode
-----
 COMMON
(1 row)
```

15) How many different types of cards are there?

```
SELECT COUNT(DISTINCT (player_class, type, set, rarity)) FROM cards;
```

```
spr2022bdb18=> SELECT COUNT(DISTINCT (player_class, type, set, rarity)) FROM cards;
  count
-----
      333
(1 row)
```

16) How many of the cards are the paladin type?

```
SELECT COUNT(player_class) FROM cards WHERE player_class='PALADIN';
```

```
spr2022bdb18=> SELECT COUNT(player_class) FROM cards WHERE player_class='PALADIN';
   count
-----
      30
(1 row)
```

17) Are there any cards with multiple weaknesses? (CHANGED due to their not being an attribute for weaknesses.)

17) Are there any HERO POWER cards that cost 0?

```
SELECT type, cost FROM cards JOIN stats ON card_id = hero_id WHERE
type='HERO POWER' AND cost=0;
```

```
spr2022bdb18=> SELECT type, cost FROM cards JOIN stats ON card_id = hero_id WHERE type='HERO POWER' AND cost=0;
   type | cost
-----+-----
(0 rows)
```

18) What is the most powerful card?

```
SELECT H.name, C.type, S.attack FROM cards C JOIN heroes H ON
C.card_id=H.hero_id JOIN stats S ON S.hero_id=C.card_id WHERE S.attack = 25;
```

```
spr2022bdb18=> SELECT H.name, C.type, S.attack FROM cards C JOIN heroes H ON C.card_id=H.hero_id JOIN stats S ON S.hero_id=C.card_id WHERE S.attack = 25;
   name    | type    | attack
-----+-----+-----
Jade Golem | MINION |      25
(1 row)
```

19) What is the weakest card?

```
SELECT H.name, C.type, S.attack FROM cards C JOIN heroes H ON
C.card_id=H.hero_id JOIN stats S ON S.hero_id=C.card_id WHERE S.attack =
(SELECT MIN	attack FROM stats);
```

```
| id WHERE attack <= (SELECT MIN(attack)
|          FROM cards)
```

name	type	attack
Animated Shield	MINION	0
Frog	MINION	0
Corrupted Egg	MINION	0
Spectral Warrior	MINION	0
Summoning Stone	MINION	0
Discarded Armor	MINION	0
Lightwell	MINION	0
Barrel	MINION	0
Enigmatic Portal	MINION	0
Target Dummy	MINION	0
Summoning Portal	MINION	0
Alarm-o-Bot	MINION	0
Mirror Image	MINION	0
Wrath of Air Totem	MINION	0
Earthen Statue	MINION	0
Explosive Rune	MINION	0
Rock	MINION	0
Shieldbearer	MINION	0
Blood Imp	MINION	0
(19 rows)		

20) Which card type occurs the most?

SELECT mode() WITHIN GROUP (ORDER BY type) from cards;

```
| spr2022bdb18=> SELECT mode() WITHIN GROUP (ORDER BY type) from cards;
|          mode
|-----
|          MINION
| (1 row)
```