

Project 5  
CS 434  
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## Part 1. Write three queries on your TDA database

This Query asks what games on their specific playforms have the rating on "M"

Query: `select gameTitle,platformName  
from playon  
where gameTitle IN (select gameTitle  
from isGivenRatings  
where ratingName = "M");`

Results:

```
mysql> select gameTitle,platformName from playon where gameTitle IN (select gameTitle from isGivenRatings where ratingName = "M");
```

gameTitle	platformName
Alone in the Dark: The New Nightmare	Nintendo Gameboy Color
Alone in the Dark: The New Nightmare	Sony Playstation
Alone in the Dark: The New Nightmare	Sega Dreamcast
Alone in the Dark: The New Nightmare	Sony Playstation 2
Bio F.R.E.A.K.S.	Nintendo 64
Bio F.R.E.A.K.S.	Sony Playstation
Blue Stinger	Sega Dreamcast
Carmageddon 64	Nintendo 64
Carrier	Sega Dreamcast
Conker's Bad Fur Day	Nintendo 64
D2	Sega Dreamcast
Daikatana	Nintendo Gameboy Color
Daikatana	Nintendo 64
Dino Crisis	Sony Playstation
Dino Crisis	Sega Dreamcast
Doom 64	Nintendo 64
Duke Nukem 64	Nintendo 64
Duke Nukem: Zero Hour	Nintendo 64
ECW Hardcore Revolution	Sega Dreamcast
ECW Hardcore Revolution	Nintendo 64
ECW Hardcore Revolution	Sony Playstation
ECW Hardcore Revolution	Nintendo Gameboy Color
Evil Dead: Hail to the King	Sega Dreamcast
Evil Dead: Hail to the King	Sony Playstation
Forsaken 64•ForsakenPAL	Nintendo 64
Grand Theft Auto 2	PC
Grand Theft Auto 2	Sega Dreamcast
Grand Theft Auto 2	Sony Playstation
Grand Theft Auto 2	Nintendo Gameboy Color

Turok 3: Shadow of Oblivion	Nintendo Gameboy Color
Turok 3: Shadow of Oblivion	Nintendo 64
Turok: Dinosaur Hunter•Turok: Jiku SenshiJP	Nintendo 64
Turok: Rage Wars	Nintendo Gameboy Color
Turok: Rage Wars	Nintendo 64
Unreal Tournament	Mac OSX
Unreal Tournament	Sega Dreamcast
Unreal Tournament	PC
Unreal Tournament	Sony Playstation 2
Urban Chaos	Sony Playstation
Urban Chaos	Sega Dreamcast
Vanishing Point	Sega Dreamcast
Vanishing Point	Sony Playstation
War Gods	Nintendo 64
War Gods	Sony Playstation
Zombie Revenge	Sega Dreamcast

107 rows in set (0.23 sec)

NOTES:1. Notice the successful join because you can see the same title on multiple platforms.

2. Some platforms did not have ratings available coupled with the fact the M games account for only 14% of video games left the data with only 107 tuples

Here we check what games have the same developer and publisher.

Query: select gameTitle, developerName  
from developedBy where developerName <> ' '  
AND developerName IN (select publisherName  
from publishedBy)  
Order by gameTitle;

Results:

```
mysql> select gameTitle, developerName from developedBy where developerName <> ' ' AND developerName IN (select publisherName from publishedBy) Order by gameTitle;
```

gameTitle	developerName
"10,000,000"	EightyEight Games LTD
"Addams Family, The"	NEC
"Adventures of Batman & Robin, The"	Novotrade
"Adventures of Buckaroo Banzai: Across the Eighth Dimension, The"	Adventure International
"Adventures of Jimmy Neutron Boy Genius: Attack of the Twonkies, The"	THQ
"Adventures of Tintin: The Secret of the Unicorn, The"	Ubisoft Montpellier
"Amagoushi no Yakata Portable: Ichiyagi Wa, Saisho no Junan"	Nippon Ichi Software
"Amazing Spider-Man 2, The"	Beenox
"Amazing Spider-Man vs. The Kingpin, The"	Sega
"Amazing Spider-Man, The"	Beenox
"Animaniacs: Lights, Camera, Action!"	Warthog
"Animaniacs: Lights, Camera, Action"	Ignition Entertainment
"Aponashi Girls: Olympos(limited edition, three-part set)"	Human Entertainment
"Army Men: World War: Land, Sea, Air"	The 3DO Company
"Asaki, Yumemishi"	Quinrose
"Atlantis, the Lost Continent"	The Code Monkeys
"Barbie: Jet, Set & Style!"	THQ
"Beatles: Rock Band, The"	Harmonix
"Best of Arcade Games (Air Hockey, Brick Breaker, Bubble Buster, Tetraminos)"	Bigben Interactive

Abuse	Crack Dot Com
Abyss	EnjoyUp Games
Abyss Odyssey	ACE Team
AC/DC Live: Rock Band Track Pack	Harmonix
AC/DC Live: Rock Band Track Pack	Harmonix Music Systems
ACA NeoGeo: A-Z	Hamster
Academy of Champions: Soccer*Academy of Champions: FootballEU	Ubisoft Vancouver
Accel Knights 2: Full Throttle	ArtePiazza
Accel World VS Sword Art Online	Artdink
Accel World: Ginyoku no Kakusei	Namco Bandai Games
Accel World: Kasoku no Chouten	Namco Bandai Games
Acceleration of Suguri X Edition	Rockin' Android
Ace Attorney Investigations 2	Capcom
Ace Attorney Investigations: Miles Edgeworth	Capcom
Ace Combat 04: Shattered Skies/ Distant Thunder	Namco
Ace Combat 2	Namco
Ace Combat 3: Electrosphere	Namco
Ace Combat 5: The Unsung War/Ace Combat: Squadron Leader	Namco

PixelJunk Shooter	Q-Games
PixelJunk Shooter 2	Q-Games
PixelJunk SideScroller	Q-Games
PixelMaker	Nostatic Software, LLC
PixelMaker	Nostatic Software
PixlCross	PixlBit Studios
Piyotama[112]	SCE Japan Studio
Pizzicato Polka: Suisei Genya	Alpha Unit
Placards	Wombat Source
Plague Inc: Evolved	Ndemc Creations

Zumba Fitness: World Party	Zoe Mode
Zumba Kids	Zoe Mode
ZuPaPa!	SNK
Zurk's Rain Forest Lab	Soleil Software
Zusar Vasar	Real Vision
Zwei!!	Nihon Falcom
+-----+-----+	
22386 rows in set (0.62 sec)	

This query asks how many game rated “E” does each platform have. (NOTE: M data set for several system platforms did not include much ratings data. So certain systems only have ratings data where they share a title across multiple platforms.)

```
Query:select platformName, count(*)
      from playon
      where gameTitle In (select gameTitle
                          from isGivenRatings
                          where ratingName = " E")
      group by platformName;
```

Results:

```
mysql> select platformName, count(*) from playon where gameTitle In (select gameTitle from isGivenRatings where ratingName = " E") group by platformName;
```

platformName	count(*)
Apple II	2
Atari 2600	3
Atari 5200	3
Atari 7800	1
ColecoVision	2
Intellivision	2
iOS	1
Mac OSX	9
NINTENDO ENTERTAINMENT SYSTEM	3
Nintendo 64	177
Nintendo Gameboy	6
Nintendo Gameboy Advance	13
Nintendo Gameboy Color	48
Nintendo Gamecube	4
Nintendo Switch	2
Nintendo Wii	3
Panasonic 3DO	1
PC	1
Sega Dreamcast	128
Sega Genesis	1
Sega Master System	1
Sega Saturn	2
Sony Playstation	67
Sony Playstation 2	15
Sony Playstation 3	5
Sony Playstation 4	1
Super Nintendo	3
XBox	6
XBox 360	1

29 rows in set (0.02 sec)

## Part 2 Write three data modification commands

This query looks for the misspelled and all caps “NINTEDO ENTERTINMENT SYSTEM”  
And replaces it with “Nintendo Entertainment System”

```
Query: update platforms
      set systemName = "Nintendo Entertainment System"
      where systemName in ( select systemName
                           from(select *
                                from platforms
                                where systemName = "NINTEDO ENTERTAINMENT SYSTEM") as
                           platform);
```

Results:

Before Update:

iOS	NULL	NULL
Linux	NULL	NULL
Mac OSX	NULL	NULL
NEO-GEO	NULL	NULL
NINTEDO ENTERTAINMENT SYSTEM	NULL	NULL
Nintendo 3DS	NULL	NULL
Nintendo 64	NULL	NULL
Nintendo DS	NULL	NULL
Nintendo Gameboy	NULL	NULL

After Update (with query in screen shot):

```
mysql> update platforms set systemName = "Nintendo Entertainment System" where systemName in ( select systemName from(select * from platforms where systemName = "NINTEDO ENTERTAINMENT SYSTEM") as platform);
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from platforms;
+-----+-----+-----+
| systemName | yearCreated | yearsActive |
+-----+-----+-----+
| Apple II | NULL | NULL |
| Atari (Infogrames) | NULL | NULL |
| Atari 2600 | NULL | NULL |
| Atari 5200 | NULL | NULL |
| Atari 7800 | NULL | NULL |
| Atari Jaguar | NULL | NULL |
| Atari Lynx | NULL | NULL |
| Atari XEGS | NULL | NULL |
| ColecoVision | NULL | NULL |
| Intellivision | NULL | NULL |
| iOS | NULL | NULL |
| Linux | NULL | NULL |
| Mac OSX | NULL | NULL |
| NEO-GEO | NULL | NULL |
| Nintendo 3DS | NULL | NULL |
| Nintendo 64 | NULL | NULL |
| Nintendo DS | NULL | NULL |
| Nintendo Entertainment System | NULL | NULL |
| Nintendo Gameboy | NULL | NULL |
```

For this I inserted any developers or publishers in the videogame table that weren't in the developer and publisher tables into the developer/ publisher tables. To do this thought I had to temporarily stop checking foreign constraints as seen in the images below. I then updated all the data correctly as to not loose unique data and break the ability to join tables correctly.

Query 1: insert into developer(name) (select title from videogame where developername not in (select name from developer));

Query 2: insert into publisher(name) (select title from videogame where publishername not in (select name from publisher));

Results:

Inserting new game it failed, then turn off foreign key check then add new game, add new developer and publishers not listed, then turn back on foreign key constraint.

```
mysql> insert into videogame(title, dateReleased, genre, secondaryGenre, developerName, publisherName)
-> values ("Red Dead Redemption 2", "March 3, 2018", "Adventure", "Role-Playing", "RockStarGames", "Take-Two InterActive" );
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('cs434'.videogame, CONSTRAINT `videogame_ibfk_1` FOREIGN KEY (`developerName`) REFERENCES `developer` (`name`))
mysql> set foreign_key_checks = 0;
Query OK, 0 rows affected (0.00 sec)

mysql> insert into videogame(title, dateReleased, genre, secondaryGenre, developerName, publisherName) values ("Red Dead Redemption 2", "March 3, 2018", "Adventure", "Role-Playing", "RockStarGames", "Take-Two InterActive" );
Query OK, 1 row affected (0.00 sec)

mysql> insert into developer(name) (select title from videogame where developername not in (select name from developer));
Query OK, 1 row affected (0.19 sec)
Records: 1 Duplicates: 0 Warnings: 0

mysql> insert into publisher(name) (select title from videogame where publishername not in (select name from publisher));
Query OK, 0 rows affected (0.68 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> set foreign_key_checks = 1;
Query OK, 0 rows affected (0.00 sec)
```

Newly added game in video game data:

```
| Red Bull BC One
| Red Crucible
| Red Dead Redemption
| Red Dead Redemption 2
| Red Dead Redemption: Undead Nightmare
| Red Dead Redemption: Into the West
```

Making sure database data is now complete since I had the foreign key check set to false:

```
mysql> insert into isGivenRatings(gameTitle, dateReleased, ratingName) Values( "Red Dead Redemption 2", "March 3, 2018", "M");
Query OK, 1 row affected (0.00 sec)

mysql> insert into developedBy(gameTitle, dateReleased, developerName) Values( "Red Dead Redemption 2", "March 3, 2018", "Rockstar Games");
Query OK, 1 row affected (0.00 sec)

mysql> insert into publishedBy(gameTitle, dateReleased, publisherName) Values( "Red Dead Redemption 2", "March 3, 2018", "Take-Two Interactive");
Query OK, 1 row affected (0.00 sec)

mysql> insert into playon(gameTitle, gameYearReleased, platformName) Values( "Red Dead Redemption 2", "March 3, 2018", "Sony Playstation 4");
Query OK, 1 row affected (0.04 sec)
```

This is a simple delete query where title is unusual data.

Query: delete from playon where title = "-";

Results:

Before delete:

```
| Zugar Vazar  
| Zwei!!  
| Zwei!!  
| Zynga Poker  
| _summer  
| Æon Flux  
| Æon Flux  
| µMahjong  
| -  
| -  
| -  
| -  
| -  
| -  
+-----+  
31840 rows in set (0.05 sec)
```

Query inserted:

```
mysql> delete from videogame where title = "-";  
Query OK, 7 rows affected (0.04 sec)  
  
mysql> select title from videogame order by title;  
+-----+  
| title  
+-----+  
| #KILLALLZOMBIES  
| #killallzombies
```

After delete:

```
| Zumba Fitness: World Party  
| Zumba Kids  
| ZuPaPa!  
| Zurk's Rain Forest Lab  
| Zugar Vazar  
| Zwei!!  
| Zwei!!  
| Zynga Poker  
| _summer  
| Æon Flux  
| Æon Flux  
| µMahjong  
+-----+  
31833 rows in set (0.05 sec)
```

### Part 3 Create a view on top of your database schema

Query: create view Nintendo\_64\_Games as select gameTitle  
from playon where platformname = "Nintendo 64";

Create View:

```
mysql> create view Nintendo_64_Games as select gameTitle from playon where platformname = "Nintendo 64";  
Query OK, 0 rows affected (0.39 sec)
```

Select \* from new table;

```
mysql> select * from Nintendo_64_Games;  
+-----+-----+  
| gameTitle |  
+-----+-----+  
| 007: The World Is Not Enough |  
| 1080° Snowboarding |  
| 64 Hanafuda: Tenshi no Yakusoku |  
| 64 Ozumo |  
| 64 Ozumo 2 |  
| 64 Trump Collection: Alice no Waku Waku Trump World |  
| A Bug's Life |  
| Aero Fighters Assault•Sonic Wings AssaultJP |  
| AeroGauge |  
| AI Shogi 3 |  
| Aidyn Chronicles: The First Mage |  
| Air Boarder 64 |  
| All Star Tennis '99•Yannick Noah All Star Tennis '99FRA |  
| All-Star Baseball 2000 |  
| All-Star Baseball 2001 |  
| All-Star Baseball 99 |  
| Animal Crossing•Dobutsu no MoriJP |  
| Armored: Project S.W.A.R.M. |  
| Army Men: Air Combat |  
| Army Men: Sarge's Heroes |  
| Army Men: Sarge's Heroes 2 |  
| Asteroids Hyper 64 |
```

Upaate Error:

Because the create view did not include the foreign key constraint in my “Create view” Table.  
It violated the playon(gameTitle, gameYear Released) foreign key constraint.

```
mysql> insert into Nintendo_64_games(gameTitle) values( "Test Game");  
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('cs434','playon', CONSTRAINT 'playon_ibfk_1' FOREIGN KEY ('gameTitle', 'gameYearReleased')  
REFERENCES 'videogame' ('title', 'dateReleased'))
```

However if I turn off foreign key constraints my update works just fine because it ignores that the game needs to match the foreign key and it allows data to be set to NULL:

```
mysql> set foreign_key_checks = 0;  
Query OK, 0 rows affected (0.00 sec)  
  
mysql> insert into Nintendo_64_games(gameTitle) values( "Test Game");  
Query OK, 1 row affected (0.04 sec)  
  
mysql> set foreign_key_checks = 1;  
Query OK, 0 rows affected (0.00 sec)
```

But with the foreign key constraint off it adds my fake “Test game” to the playon table without a date or system name breaking my data consistency.

```
| Test Drive: Ferrari Racing Legends | "July 3, 2012" | Xbox 360 |  
| Test Game | | |  
| Test Your Mind | "November 12, 2015" | Nintendo Wii U |  
| Testament of Sherlock Holmes, The | "September 25, 2013" | Xbox 360 |
```

## Part 4 Create at least one useful index for your TDA

I created two indexes:

1.

```
mysql> create index gameSystem on playson(platformname);
Query OK, 0 rows affected (0.62 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

2.

```
mysql> create index gamedev on developedBy(gameTitle,developerName);
Query OK, 0 rows affected (0.49 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

I then ran the three queries from above:

1. `select gameTitle,platformName from playson where gameTitle IN (select gameTitle from isGivenRatings where ratingName = " M");`
2. `select gameTitle, developerName from developedBy where developerName <> ' ' AND developerName IN (select publisherName from publishedBy) Order by gameTitle;`
3. `select platformName, count(*) from playson where gameTitle In (select gameTitle from isGivenRatings where ratingName = " E") group by platformName;`

In theory, I thought they would speed up the search time. But instead only sped up the search time for the last query from above. My indexes were not helpful in this case. Results with times can be seen below:

```
mysql> show profiles;
+-----+-----+-----+
| Query_ID | Duration | Query |
+-----+-----+-----+
| 1 | 0.00915500 | select gameTitle,platformName from playson where gameTitle IN (select gameTitle from isGivenRatings where ratingName = " M") |
| 2 | 0.37035600 | select gameTitle, developerName from developedBy where developerName <> ' ' AND developerName IN (select publisherName from publishedBy) Order by gameTitle |
| 3 | 0.02862100 | select platformName, count(*) from playson where gameTitle In (select gameTitle from isGivenRatings where ratingName = " E") group by platformName |
| 4 | 0.62356400 | create index gameSystem on playson(platformname) |
| 5 | 0.00031200 | create index gamedev on developedBy(gameTitle,developer) |
| 6 | 0.49167700 | create index gamedev on developedBy(gameTitle,developerName) |
| 7 | 0.00298200 | select gameTitle,platformName from playson where gameTitle IN (select gameTitle from isGivenRatings where ratingName = " M") |
| 8 | 0.45800600 | select gameTitle, developerName from developedBy where developerName <> ' ' AND developerName IN (select publisherName from publishedBy) Order by gameTitle |
| 9 | 0.01497100 | select platformName, count(*) from playson where gameTitle In (select gameTitle from isGivenRatings where ratingName = " E") group by platformName |
+-----+-----+-----+
9 rows in set, 1 warning (0.00 sec)
```