University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: ___4_____

Date: ___2023/4/4___

Group Number: ____37_____

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Luna Wang	97806434	q2s1u	lunawang1004@gmail.com
Ray Huang	79217667	s6j0y	hzr18739931839@gmail.com
Yulu Duan	23366081	j5f7u	efyulu@student.ubc.ca

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

University of British Columbia, Vancouver
Department of Computer Science

SQL Script

The script that is used to create all the tables and default data in the database can be found in project_j5f7u_q2s1u_s6j0y/default.sql by following the repository link we submitted.

Project Description

This project is focused on Steam, a popular online game distribution platform launched in 2003. Unlike regular retail business and online shopping, the Steam platform includes many other functions for the users/players like "Community", "Sales Event" and "In-game items trading market", aiming to improve the user experience.

What it accomplished

It has created 24 3NF relations that have contained the related information for users, games, sales events, and companies. The default.sql provided 5 tuples for each table as our default data. On our website, we have provided the following functions:

- The user is able to view the default data for UserInfo and UserProfile.
- The user is able to insert a new user by providing the ID, Location, Phone Number, and User name. It will show an error message if the ID is duplicate or the phone number doesn't follow the format (123-456-7890).
- The user is able to delete a user by entering the user ID.
- The user is able to update the user's name, location, and phone number for a specific user ID.
- The user is able to find all the games below a specific price or released before a specific date.
- The user is able to view any number of attributes in any table.
- The user is able to search for which games are under a specific genre.
- The user is able to count the number of games each user has.
- The user is able to find how many people are playing the specific genre of game.
- The user is able to find average prices for the genres that have more than 1 game.
- The user is able to find the company name who participated all the sales events.

How did our final schema and default data differed from the M2

Our final schema is still the same and the default data for the SalesEventContent table changed from

INSERT
INTO SalesEventContent
VALUES (2, 'Summer sale 2022', NULL);

INSERT
INTO SalesEventContent
VALUES (3, 'Winter sale 2022', NULL);

INSERT
INTO SalesEventContent
VALUES (4, 'Sports Fest', 4);

INSERT
INTO SalesEventContent
VALUES (5, 'Scream Fest', NULL);

To:

INSERT
INTO SalesEventContent
VALUES (2, 'Summer sale 2022', 2);

INSERT
INTO SalesEventContent
VALUES (3, 'Winter sale 2022', 2);

INSERT
INTO SalesEventContent
VALUES (4, 'Sports Fest', 2);

INSERT
INTO SalesEventContent
VALUES (5, 'Scream Fest', 2);

In order to perform the division query.

Copy of the schema and screenshots that show what data is present
Schema:
UserInfo (Playtime: double, UID: integer, Location: string, Phone#: string, **Profile URL**: string)
UserProfile (Profile URL: string, User name: string, Creation Date: Date, Account Level: integer)
FriendOf (**UID**: integer, **FUID:** integer)
SupportTicketRequest (TID: integer, **Description**: string, **Date reported**: Date, **UID**: integer)
SupportTicketStatus (Description: string, Date reported: Date, **UID**: integer, Status: string)
Own (**UID**: integer, **GID**: integer, Date: Date, Ownership type: string)
GameInfo (GID: integer, **URL**: string, Description: string, **CPID**: integer, **CDID**: integer)
GameURL (URL: string, **Name:** string, **Release Date**: Date, Requirements: string, # of internal achievement: integer)
GamePrice (Name: string, Release Date: Date, Price: double)

University of British Columbia, Vancouver
Department of Computer Science

CompanyInfo (<u>CID</u>: integer, Email: string, **Name**: string, **Location**: string)

CompanyRevenue (<u>Name</u>: string, <u>Location</u>: string, Revenue: double)

Publisher (**<u>CPID</u>**: integer, # of game published: integer)

Developer (**<u>CDID</u>**: integer, # of game developed: integer)

BelongsTo (**<u>GID</u>**: integer, **<u>GeID</u>**: integer)

GenreUpdate (<u>Name</u>: string, LastUpdatedDate: Date)

GenreDescription (<u>GeID</u>: integer, **Description**: string)

GenreName (<u>Description</u>: string, **Name**: string)

ReviewWriteAssociateContent (<u>RID</u>: integer, **<u>GID</u>**: integer, **Review Text**: string, **rating**: integer, **Post Date**: Date)

ReviewWriteAssociateUser (<u>Review Text</u>: string, <u>rating</u>: integer, <u>Post Date</u>: Date, **UID**: integer)

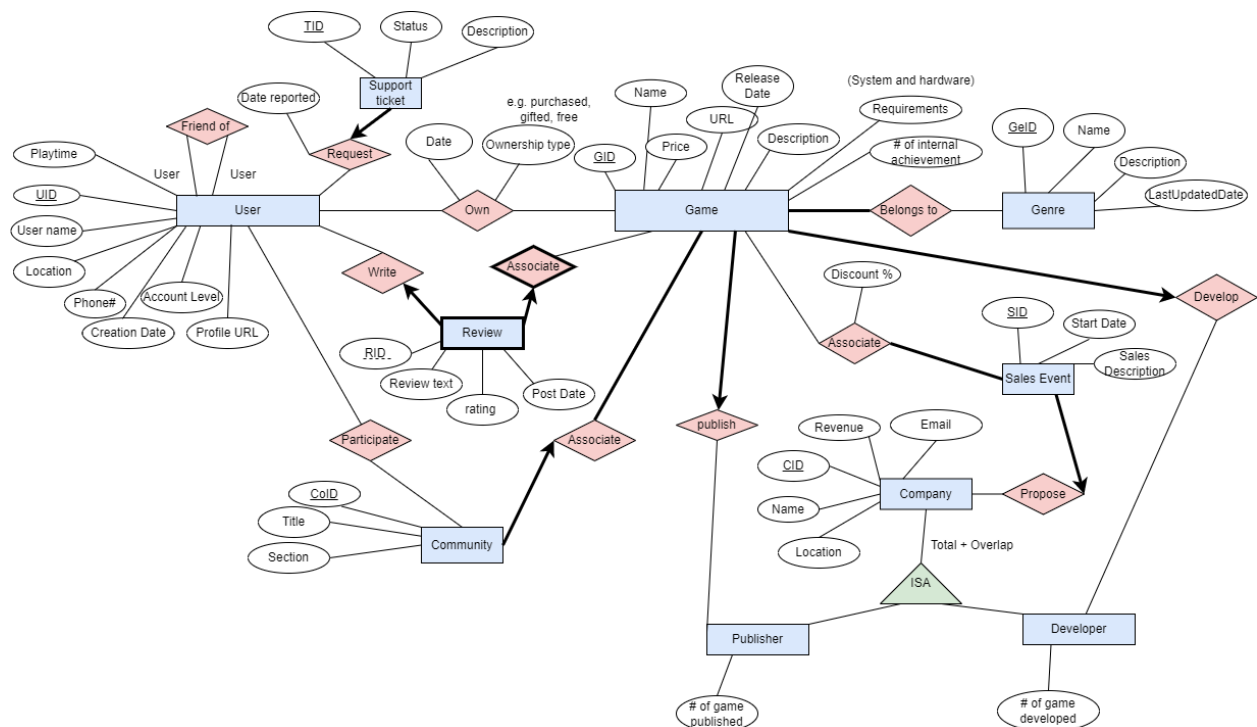Participate (**<u>CoID</u>**: integer, **<u>UID</u>**: integer)

CommunityAssociate (<u>CoID</u>: integer, **GID**: integer, Title: string, Section: string)

DiscountAssocaite (**<u>GID</u>**: integer, **<u>SID</u>**: integer, Discount %: integer)

SalesEventContent (<u>SID</u>: integer, **Sales Description**: string, **CID**: integer)

SalesEventDate (<u>Sales Description</u>: string, Start Date: Date)

Database:
```
select * from BELONGSTO;
```

	GID	GeID
1	1	1
2	4	1
3	5	1
4	2	2
5	3	2

```
select * from COMMUNITYASSOCIATE;
```

	CoID	GID	Title	Section
1	1	2	Players made artwork	Artwork
2	2	5	In-game screenshots	Screenshot
3	3	1	Trouble shooting discussion	Discussion
4	4	3	Trouble shooting discussion	Discussion
5	5	4	In-game screenshots	Screenshot

```
select * from COMPANYREVENUE;
```

	Name	Location	Revenue
1	Activition Games	Santa Monica, California, US	8.803
2	CD Project Red	Warsaw, Poland	229.9
3	FromSoftware Inc.	Tokyo, Japan	186
4	Rockstar Games	New York City, US	63
5	Warner Bro. Games	Burbank, California, US	62.7

```
select * from DEVELOPER;
```

	CDID	NumGamesDeveloped
1	1	24
2	2	22
3	3	110
4	4	49
5	5	5

```
select * from DISCOUNTASSOCIATE;
```

	GID	SID	DiscountPercentage	
1	2	1	65	
2	3	1	50	
3	3	2	60	
4	4	3	75	
5	5	4	20	

```
select * from FRIENDOF;
```

	UserID	FUID	
1	4	1	
2	1	2	
3	5	2	
4	3	4	
5	2	5	

```
select * from GAMEINFO;
```

	GID	URL	gameDescription	CPID	CDID
1	1	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy is an immersive, open-world action RPG s	3	3
2	2	https://store.steampowered.com/app/1174180/Red_Dead_R	Arthur Morgan and the Van der Linde gang are outlaws on th	2	2
3	3	https://store.steampowered.com/app/271590/Grand_Theft_	When a young street hustler, a retired bank robber, and a te	5	5
4	4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice is an intense, third-person, actio	4	4
5	5	https://store.steampowered.com/app/1245620/ELDEN_RING	Elden Ring is an action role-playing game played in a third p	1	1

```
select * from GAMEPRICE;
```

	Name	Release_Date	Price
1	Elden Ring	2022-02-24	79.99
2	GRAND THEFT AUTO V	2015-04-15	29.98
3	Hogwarts Legacy	2023-02-10	79.99
4	Red Dead Redemption 2	2019-12-05	79.99
5	Sekiro: Shadows Die Twice	2019-03-21	79.99

```
select * from GAMEURL;
```

	URL	Name	Release_Date	Requirements
1	https://store.steampowered.com/app/1174180/Red_Dead_Re	Red Dead Redemption 2	2019-12-05	150 GB available space
2	https://store.steampowered.com/app/1245620/ELDEN_RING	Elden Ring	2022-02-24	60 GB available space
3	https://store.steampowered.com/app/271590/Grand_Theft_	GRAND THEFT AUTO V	2015-04-15	72 GB available space
4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice	2019-03-21	25 GB available space
5	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy	2023-02-10	85 GB available space

```
select * from GENRENAME;
```

	Description	Name
1	An action game is a video game genre that emphasizes phys	Action
2	Multiplayer online battle arena (MOBA) is a subgenre of stra	MOBA
3	Racing games are a video game genre in which the player pa	Racing
4	Role-Playing Game, a game in which players assume the rol	RPG
5	A sandbox game is a video game with a gameplay element t	Sandbox

```
select * from GENREUPDATE;
```

	Name	LastUpdatedDate
1	Action	2023-02-10
2	MOBA	2023-02-26
3	Racing	2023-02-23
4	RPG	2023-02-16
5	Sandbox	2023-01-17

```
select * from OWN;
```

	UserID	GID	ownDate	Ownership_type	☰
1	1	1	2023-02-28	Purchased	
2	2	2	2020-05-06	Purchased	
3	2	4	2021-07-20	Free for testing	
4	3	5	2022-09-20	Purchased	
5	5	3	2019-12-25	Gifted from friend	

```
select * from PARTICIPATE;
```

	CoID	UserID	
1	5	1	
2	4	2	
3	3	3	
4	2	4	
5	1	5	

```
select * from PUBLISHER;
```

	CPID	NumGamesPublished	
1	1	24	
2	2	27	
3	3	256	
4	4	750	
5	5	5	

```
select * from REVIEWWRITEASSOCIATECONTENT;
```

	RID	GID	ReviewText	Rating	PostDate
1	4	3	Enjoyable	5	2019-05-03
2	2	2	Good	5	2021-09-08
3	1	5	Love this game	5	2022-11-23
4	5	1	Once starting the game, Windows will restart...	2	2023-02-09
5	3	3	Too many cheaters!	3	2020-06-20

```
select * from REVIEWWRITEASSOCIATEUSER;
```

	ReviewText	Rating	PostDate	UserID	
1	Love this game	5	2022-11-23	1	
2	Enjoyable	5	2019-05-03	2	
3	Good	5	2021-09-08	2	
4	Too many cheaters!	3	2020-06-20	3	
5	Once starting the game, Windows will restart...	2	2023-02-09	5	

```
select * from SALESEVENTCONTENT;
```

	SID	SalesDescription	CID	
1	1	Rockstar Game Publisher Sale	2	
2	2	Summer sale 2022	2	
3	3	Winter sale 2022	2	
4	4	Sports Fest	2	
5	5	Scream Fest	2	

```
select * from SALESEVENTDATE;
```

	SalesDescription	StartDate	
1	Rockstar Game Publisher Sale	2021-08-19	
2	Scream Fest	2022-10-26	
3	Sports Fest	2022-05-15	
4	Summer sale 2022	2022-06-29	
5	Winter sale 2022	2022-12-20	

```
select * from SUPPORTTICKETREQUEST;
```

	TID	Description	Date_reported	UserID	
1	5	Game is not in my game library	2020-09-06	5	
2	3	Game Refund	2021-06-06	1	
3	4	Game Refund	2023-01-23	2	
4	1	Gameplay or technical issues	2023-01-23	3	
5	2	Missing DLC or extra content	2013-10-19	2	

```
select * from SUPPORTTICKETSTATUS;
```

	Description	Date_reported	UserID	Status
1	Game is not in my game library	2020-09-06	5	Resolved
2	Game Refund	2021-06-06	1	Resolved
3	Game Refund	2023-01-23	2	In Progress
4	Gameplay or technical issues	2023-01-23	3	In Progress
5	Missing DLC or extra content	2013-10-19	2	Resolved

```
select * from USERINFO;
```

	Playtime	UserID	UserLocation	PhoneNum	Profile_URL
1	1000	1	Canada	604-012-8901	https://steamcommunity.com/id/1/
2	300	2	USA	206-780-4576	https://steamcommunity.com/id/2/
3	2560	3	USA	080-345-6048	https://steamcommunity.com/id/3/
4	5000	4	USA	112-530-8761	https://steamcommunity.com/id/4/
5	8920	5	Canada	009-056-8701	https://steamcommunity.com/id/5/

```
select * from USERPROFILE;
```

	Profile_URL	User_name	Creation_Date	Account_Level	
1	https://steamcommunity.com/id/1/	Sniper	2019-09-19	50	
2	https://steamcommunity.com/id/2/	NaviElec	2009-10-18	100	
3	https://steamcommunity.com/id/3/	Mr.Database	2020-05-05	15	
4	https://steamcommunity.com/id/4/	0x15	2022-12-23	3	
5	https://steamcommunity.com/id/5/	304Lover	2018-08-04	15	

```
select * from GenreDescription;
```

	GeID	Description	
1	5	A sandbox game is a video game with a gameplay element t	
2	2	An action game is a video game genre that emphasizes phys	
3	3	Multiplayer online battle arena (MOBA) is a subgenre of stra	
4	4	Racing games are a video game genre in which the player pa	
5	1	Role-Playing Game, a game in which players assume the rol	

CompanyInfo:

University of British Columbia, Vancouver
Department of Computer Science

	CID	Email	Name	Location
1	1	web-support@fromsoftware.co.jp	FromSoftware Inc.	Tokyo, Japan
2	2	support@rockstargames.com	Rockstar Games	New York City, US
3	3	ex.jane.doe@warnerbros.com	Warner Bro. Games	Burbank, California, US
4	4	privacy@activision.com	Activition Games	Santa Monica, California, US
5	5	biz@cdprojektred.com	CD Project Red	Warsaw, Poland

SQL queries and where it can be found

INSERT Query:

project_j5f7u_q2s1u_s6j0y/database.sql, line 554 and 555

```
insert into UserProfile values (:Profile_URL, :User_name, :Creation_Date,
:Account_Level
insert into UserInfo values (:Playtime, :UserID, :UserLocation, :PhoneNum,
:Profile_URL
```

DELETE Query:

project_j5f7u_q2s1u_s6j0y/database.sql, line 692

```
DELETE FROM UserProfile up WHERE up.Profile_URL = '" . $profileURL . "'
```

Update Query:

project_j5f7u_q2s1u_s6j0y/database.sql, line 581

```
UPDATE UserProfile SET User_name='" . $new_user_name . "' WHERE
Profile_URL='" . $profileURL . "'
```

project_j5f7u_q2s1u_s6j0y/database.sql, line 584

```
UPDATE UserInfo SET UserLocation='" . $new_location . "' WHERE UserID='" .
$user_id . "'
```

project_j5f7u_q2s1u_s6j0y/database.sql, line 587

```
UPDATE UserInfo SET PhoneNum='" . $new_phone_number . "' WHERE UserID='" .
$user_id . "'
```

Selection Query:

project_j5f7u_q2s1u_s6j0y/database.sql, line 370

```
SELECT Name, $selectedColumns FROM GamePrice WHERE Release_Date <
TO_DATE('" . $releaseDate . "') AND Price < $price
```

project_j5f7u_q2s1u_s6j0y/database.sql, line 372

```
SELECT Name, $selectedColumns FROM GamePrice WHERE Price < $price
```

project_j5f7u_q2s1u_s6j0y/database.sql, line 374

```
SELECT Name, $selectedColumns FROM GamePrice WHERE Release_Date <
TO_DATE('" . $releaseDate . "')
```

University of British Columbia, Vancouver
Department of Computer Science

Projection Query:
project_j5f7u_q2s1u_s6j0y/database.sql, line 657
```
SELECT $selectedColumns FROM $tableName
```

Join Query:
project_j5f7u_q2s1u_s6j0y/database.sql, line 627 - 629
```
SELECT DISTINCT gu.Name, gu.URL
            FROM GameInfo gi,BelongsTo bt, GenreDescription gd,
GenreName gn, GameURL gu
            WHERE bt.GID = gi.GID AND bt.GeID = gd.GeID AND
gd.Description = gn.Description AND gu.URL = gi.URL AND gn.Name =
'{$_GET['joinGenre']}'
```

Aggregation with Group By
project_j5f7u_q2s1u_s6j0y/database.sql, line 717 - 720
```
SELECT o.UserID, up.User_name, COUNT(*)
        FROM Own o, UserProfile up, UserInfo ui
        WHERE o.UserID = ui.UserID AND ui.Profile_URL = up.Profile_URL
        GROUP BY o.UserID, up.User_name
```

Aggregation with Having
project_j5f7u_q2s1u_s6j0y/database.sql, line 324 - 328
```
SELECT DISTINCT COUNT(o.UserID), gn.Name
        FROM Own o,BelongsTo bt, GenreDescription gd, GenreName gn
        WHERE bt.GID = o.GID AND bt.GeID = gd.GeID AND gd.Description
= gn.Description
        GROUP BY gn.Name
        Having gn.Name = '{$_GET['Genren']}'
```

Nested Aggregation with Group By
project_j5f7u_q2s1u_s6j0y/database.sql, line 749 - 756
```
SELECT gd.GeID, gn.Name, AVG(gp.price)
        FROM GameInfo gi,BelongsTo bt, GenreDescription gd, GameURL gu,
GamePrice gp, GenreName gn
        WHERE bt.GID = gi.GID AND bt.GeID = gd.GeID AND gi.URL = gu.URL
AND gu.Name = gp.Name AND gu.Release_Date = gp.Release_Date AND
gd.description = gn.description
```

```
        GROUP BY gd.GeID, gn.Name

        Having 1 < (SELECT COUNT(*)

                    FROM BelongsTo bt1

                    WHERE bt1.GeID = gd.GeID

                    GROUP BY bt1.GeID)
```

Division Query

project_j5f7u_q2s1u_s6j0y/database.sql, line 405 - 413

```
SELECT DISTINCT C.Name

     FROM CompanyInfo C, SalesEventContent S2

     WHERE NOT EXISTS

     ((SELECT S.SID

       FROM  SalesEventContent S)

       MINUS

       (SELECT S1.SID

        FROM SalesEventContent S1

        WHERE S1.CID = C.CID))
```

University of British Columbia, Vancouver
Department of Computer Science

Screenshots demonstrating the functionality

Insert Before:

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/
5	Canada	009-056-8701	8920	https://steamcommunity.com/id/5/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3
https://steamcommunity.com/id/5/	304Lover	04-AUG-18	15

Insert During:

Insert a new user

ID: 6

Location: Canada

Phone Number: 236-989-8928   Format: 123-456-7890

User name: Eri

Insert

Insert After:

University of British Columbia, Vancouver
Department of Computer Science
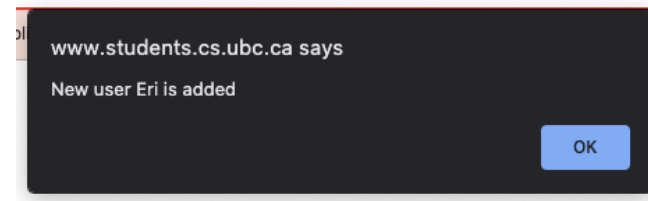
www.students.cs.ubc.ca says

New user Eri is added

OK

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/
5	Canada	009-056-8701	8920	https://steamcommunity.com/id/5/
6	Canada	236-989-8928	0	https://steamcommunity.com/id/6/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3
https://steamcommunity.com/id/5/	304Lover	04-AUG-18	15
https://steamcommunity.com/id/6/	Eri	04-APR-23	1

Delete Before:

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/
5	Canada	009-056-8701	8920	https://steamcommunity.com/id/5/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3
https://steamcommunity.com/id/5/	304Lover	04-AUG-18	15

delete during:

Delete a User

User ID : 5

Delete

Delete after:

University of British Columbia, Vancouver
Department of Computer Science

User with ID 5 has been deleted.

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3

University of British Columbia, Vancouver
Department of Computer Science

Update Before:

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/
5	Canada	009-056-8701	8920	https://steamcommunity.com/id/5/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3
https://steamcommunity.com/id/5/	304Lover	04-AUG-18	15

Update During:

Update user location

Please first provide your user ID, and then enter your new user name, new location or phone number. Please note that you cannot update your profile URL, creation date, account level, playtime, and user id. Please leave the entry box blank if you don't want to update that value.

The values are case sensitive and if you enter in the wrong case, the update statement will not do anything.

UserID: 5

New User Name: Mira

New Location: USA

New Phone Number: 234-678-1280   Format: 123-456-7890

[Update]

Update After:

University of British Columbia, Vancouver
Department of Computer Science

User Information is successfully updated

UserInfo

User ID	User Location	Phone Number	Playtime	Profile URL
1	Canada	604-012-8901	1000	https://steamcommunity.com/id/1/
2	USA	206-780-4576	300	https://steamcommunity.com/id/2/
3	USA	080-345-6048	2560	https://steamcommunity.com/id/3/
4	USA	112-530-8761	5000	https://steamcommunity.com/id/4/
5	USA	234-678-1280	8920	https://steamcommunity.com/id/5/

UserProfile

Profile_URL	User_name	Creation_Date	Account_Level
https://steamcommunity.com/id/1/	Sniper	19-SEP-19	50
https://steamcommunity.com/id/2/	NaviElec	18-OCT-09	100
https://steamcommunity.com/id/3/	Mr.Database	05-MAY-20	15
https://steamcommunity.com/id/4/	0x15	23-DEC-22	3
https://steamcommunity.com/id/5/	Mira	04-AUG-18	15

Join Before:
(all the tables that participate in the join query)
GameInfo

	GID	URL	gameDescription	CPID	CDID
1	1	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy is an immersive, open-world action RPG s	3	3
2	2	https://store.steampowered.com/app/1174180/Red_Dead_Re	Arthur Morgan and the Van der Linde gang are outlaws on th	2	2
3	3	https://store.steampowered.com/app/271590/Grand_Theft_	When a young street hustler, a retired bank robber, and a te	5	5
4	4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice is an intense, third-person, actio	4	4
5	5	https://store.steampowered.com/app/1245620/ELDEN_RING	Elden Ring is an action role-playing game played in a third p	1	1

BelongsTo

	GID	GeID	
1	1	1	
2	4	1	
3	5	1	
4	2	2	
5	3	2	

GenreName

	Description	Name	
1	An action game is a video game genre that emphasizes phys	Action	
2	Multiplayer online battle arena (MOBA) is a subgenre of stra	MOBA	
3	Racing games are a video game genre in which the player pa	Racing	
4	Role-Playing Game, a game in which players assume the role	RPG	
5	A sandbox game is a video game with a gameplay element t	Sandbox	

GameURL

	URL	Name	Release_Date	Requirements
1	https://store.steampowered.com/app/1174180/Red_Dead_R	Red Dead Redemption 2	2019-12-05	150 GB available space
2	https://store.steampowered.com/app/1245620/ELDEN_RING	Elden Ring	2022-02-24	60 GB available space
3	https://store.steampowered.com/app/271590/Grand_Theft_	GRAND THEFT AUTO V	2015-04-15	72 GB available space
4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice	2019-03-21	25 GB available space
5	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy	2023-02-10	85 GB available space

GenreDescription

	GeID	Description	
1	5	A sandbox game is a video game with a gameplay element t	
2	2	An action game is a video game genre that emphasizes phys	
3	3	Multiplayer online battle arena (MOBA) is a subgenre of stra	
4	4	Racing games are a video game genre in which the player pa	
5	1	Role-Playing Game, a game in which players assume the role	

Join During:

Search which games are under a specific genre

Genre ✓ RPG
           Action
Find   Moba
           Racing
           Sandbox

Join After: (this is an example result if we choose RPG)

Game Found

Game Name	Game URL
Elden Ring	https://store.steampowered.com/app/1245620/ELDEN_RING/
Sekiro: Shadows Die Twice	https://store.steampowered.com/app/814380/Sekiro_Shadows_Die_Twice__GOTY_Edition/
Hogwarts Legacy	https://store.steampowered.com/app/990080/Hogwarts_Legacy/

Aggregation with Group By Before
(all the tables that participate in the join query)
Own

	UserID	GID	ownDate	Ownership_type	☰
1	1	1	2023-02-28	Purchased	
2	2	2	2020-05-06	Purchased	
3	2	4	2021-07-20	Free for testing	
4	3	5	2022-09-20	Purchased	
5	5	3	2019-12-25	Gifted from friend	

UserProfile

University of British Columbia, Vancouver
Department of Computer Science

	Profile_URL	User_name	Creation_Date	Account_Level	
1	https://steamcommunity.com/id/1/	Sniper	2019-09-19	50	
2	https://steamcommunity.com/id/2/	NaviElec	2009-10-18	100	
3	https://steamcommunity.com/id/3/	Mr.Database	2020-05-05	15	
4	https://steamcommunity.com/id/4/	0x15	2022-12-23	3	
5	https://steamcommunity.com/id/5/	304Lover	2018-08-04	15	

UserInfo

	Playtime	UserID	UserLocation	PhoneNum	Profile_URL
1	1000	1	Canada	604-012-8901	https://steamcommunity.com/id/1/
2	300	2	USA	206-780-4576	https://steamcommunity.com/id/2/
3	2560	3	USA	080-345-6048	https://steamcommunity.com/id/3/
4	5000	4	USA	112-530-8761	https://steamcommunity.com/id/4/
5	8920	5	Canada	009-056-8701	https://steamcommunity.com/id/5/

Aggregation with Group By During:

Count the number of games each user have

Find

Aggregation with Group By After:

User ID	User Name	Number of Games
1	Sniper	1
2	NaviElec	2
3	Mr.Database	1
5	Mira	1

University of British Columbia, Vancouver
Department of Computer Science

Projection before(choose UserInfo relation as an example)

	Playtime	UserID	UserLocation	PhoneNum	Profile_URL
1	1000	1	Canada	604-012-8901	https://steamcommunity.com/id/1/
2	300	2	USA	206-780-4576	https://steamcommunity.com/id/2/
3	2560	3	USA	080-345-6048	https://steamcommunity.com/id/3/
4	5000	4	USA	112-530-8761	https://steamcommunity.com/id/4/
5	8920	5	Canada	009-056-8701	https://steamcommunity.com/id/5/

Projection during

Choose Attributes to View:

Select a relation: User Info

> User Profile
> User Info
> Friends
> SupportTicketStatus
> SupportTicketRequest
> CompanyRevenue
> CompanyInfo
> Publisher
> Developer
> GamePrice
> GameURL

Select one table, ...xes and make sure choose the desired table again.

Select attributes:

Submit

Choose Attributes to View:

Select a relation: User Info

Select one table, click submit, fill in checkboxes and make sure choose the desired table again.

Select attributes:
- ☐ Playtime
- ☑ UserID
- ☑ UserLocation
- ☑ PhoneNum
- ☐ Profile_URL

Submit

Projection After

Projection Results

UserID	UserLocation	PhoneNum
1	Canada	604-012-8901
2	USA	206-780-4576
3	USA	080-345-6048
4	USA	112-530-8761
5	Canada	009-056-8701

Nested Aggregation with Group By Before

GameInfo

	GID	URL	gameDescription	CPID	CDID
1	1	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy is an immersive, open-world action RPG s	3	3
2	2	https://store.steampowered.com/app/1174180/Red_Dead_R	Arthur Morgan and the Van der Linde gang are outlaws on th	2	2
3	3	https://store.steampowered.com/app/271590/Grand_Theft_	When a young street hustler, a retired bank robber, and a te	5	5
4	4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice is an intense, third-person, actio	4	4
5	5	https://store.steampowered.com/app/1245620/ELDEN_RING	Elden Ring is an action role-playing game played in a third p	1	1

BelongsTo

	GID	GeID	
1	1	1	
2	4	1	
3	5	1	
4	2	2	
5	3	2	

GenreDescription

University of British Columbia, Vancouver
Department of Computer Science

	GeID	Description
1	5	A sandbox game is a video game with a gameplay element t
2	2	An action game is a video game genre that emphasizes phys
3	3	Multiplayer online battle arena (MOBA) is a subgenre of stra
4	4	Racing games are a video game genre in which the player pa
5	1	Role-Playing Game, a game in which players assume the rol

GameURL

	URL	Name	Release_Date	Requirements
1	https://store.steampowered.com/app/1174180/Red_Dead_R	Red Dead Redemption 2	2019-12-05	150 GB available space
2	https://store.steampowered.com/app/1245620/ELDEN_RINC	Elden Ring	2022-02-24	60 GB available space
3	https://store.steampowered.com/app/271590/Grand_Theft_	GRAND THEFT AUTO V	2015-04-15	72 GB available space
4	https://store.steampowered.com/app/814380/Sekiro_Shado	Sekiro: Shadows Die Twice	2019-03-21	25 GB available space
5	https://store.steampowered.com/app/990080/Hogwarts_Le	Hogwarts Legacy	2023-02-10	85 GB available space

GamePrice

	Name	Release_Date	Price
1	Elden Ring	2022-02-24	79.99
2	GRAND THEFT AUTO V	2015-04-15	29.98
3	Hogwarts Legacy	2023-02-10	79.99
4	Red Dead Redemption 2	2019-12-05	79.99
5	Sekiro: Shadows Die Twice	2019-03-21	79.99

GenreName

	Description	Name
1	An action game is a video game genre that emphasizes phys	Action
2	Multiplayer online battle arena (MOBA) is a subgenre of stra	MOBA
3	Racing games are a video game genre in which the player pa	Racing
4	Role-Playing Game, a game in which players assume the rol	RPG
5	A sandbox game is a video game with a gameplay element t	Sandbox

Nested Aggregation with Group By During

Find average prices for the genres that have more than 1 games

Find

Nested Aggregation with Group By After

Genre ID	Genre Name	Average Price
1	RPG	79.99
2	Action	54.985

Selection before:
GamePrice table

	Name	Release_Date	Price
1	Elden Ring	2022-02-24	79.99
2	GRAND THEFT AUTO V	2015-04-15	29.98
3	Hogwarts Legacy	2023-02-10	79.99
4	Red Dead Redemption 2	2019-12-05	79.99
5	Sekiro: Shadows Die Twice	2019-03-21	79.99

Selection during:

University of British Columbia, Vancouver
Department of Computer Science

SELECTION Query

Find all the games below a specific price or released before a specific date

☑ Price: `80`
☑ Release Date (Fromat: 02-FEB-2023): `28-JAN-2020`
`Select`

---

selection after:

Selection Results

Game Name	Price	Release_Date
GRAND THEFT AUTO V	29.98	15-APR-15
Red Dead Redemption 2	79.99	05-DEC-19
Sekiro: Shadows Die Twice	79.99	21-MAR-19

University of British Columbia, Vancouver
Department of Computer Science

Aggregation with Having before:

own table:

	UserID	GID	ownDate	Ownership_type	≡
1	1	1	2023-02-28	Purchased	
2	2	2	2020-05-06	Purchased	
3	2	4	2021-07-20	Free for testing	
4	3	5	2022-09-20	Purchased	
5	5	3	2019-12-25	Gifted from friend	

BelongsTo table:

	GID	GeID	
1	1	1	
2	4	1	
3	5	1	
4	2	2	
5	3	2	

GenreDescription table:

	GeID	Description
1	5	A sandbox game is a video game with a gameplay element t
2	2	An action game is a video game genre that emphasizes phys
3	3	Multiplayer online battle arena (MOBA) is a subgenre of stra
4	4	Racing games are a video game genre in which the player pa
5	1	Role-Playing Game, a game in which players assume the rol

GenreName table:

University of British Columbia, Vancouver
Department of Computer Science

	Description	Name
1	An action game is a video game genre that emphasizes phys	Action
2	Multiplayer online battle arena (MOBA) is a subgenre of stra	MOBA
3	Racing games are a video game genre in which the player pa	Racing
4	Role-Playing Game, a game in which players assume the role	RPG
5	A sandbox game is a video game with a gameplay element t	Sandbox

Aggregation with Having during:

Find how many people are playing the specific genre of game

Genre   ✓ RPG

           Action

Find   Moba

           Racing

Fin   Sandbox   rices for the genres that have more than 1 game

Aggregation with Having after: (here is an example if we choose Action)

Genre Found

Genre Name	Number of Player
Action	2

Division before:

CompanyInfo table:

	CID	Email	Name	Location
1	1	web-support@fromsoftware.co.jp	FromSoftware Inc.	Tokyo, Japan
2	2	support@rockstargames.com	Rockstar Games	New York City, US
3	3	ex.jane.doe@warnerbros.com	Warner Bro. Games	Burbank, California, US
4	4	privacy@activision.com	Activition Games	Santa Monica, California, US
5	5	biz@cdprojektred.com	CD Project Red	Warsaw, Poland

SalesEventContent table:

	SID	SalesDescription	CID
1	1	Rockstar Game Publisher Sale	2
2	2	Summer sale 2022	2
3	3	Winter sale 2022	2
4	4	Sports Fest	2
5	5	Scream Fest	2

Division during:

Find the company name who've participated all the sales events

Find

Division after:

Company Name
Rockstar Games