Creating a Game Rental Network Database

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Understanding of this project

This project is designed to teach students how to create a database management system from scratch. Starting with a problem and then creating a full solution to address the problem.

Goal of this project

The goal of this project is to provide a system that manages the inventory and rental of video games in a rental store network.

There are many stores in this network, each in a different region carrying different stock and having different employees.

Technical problems and issues

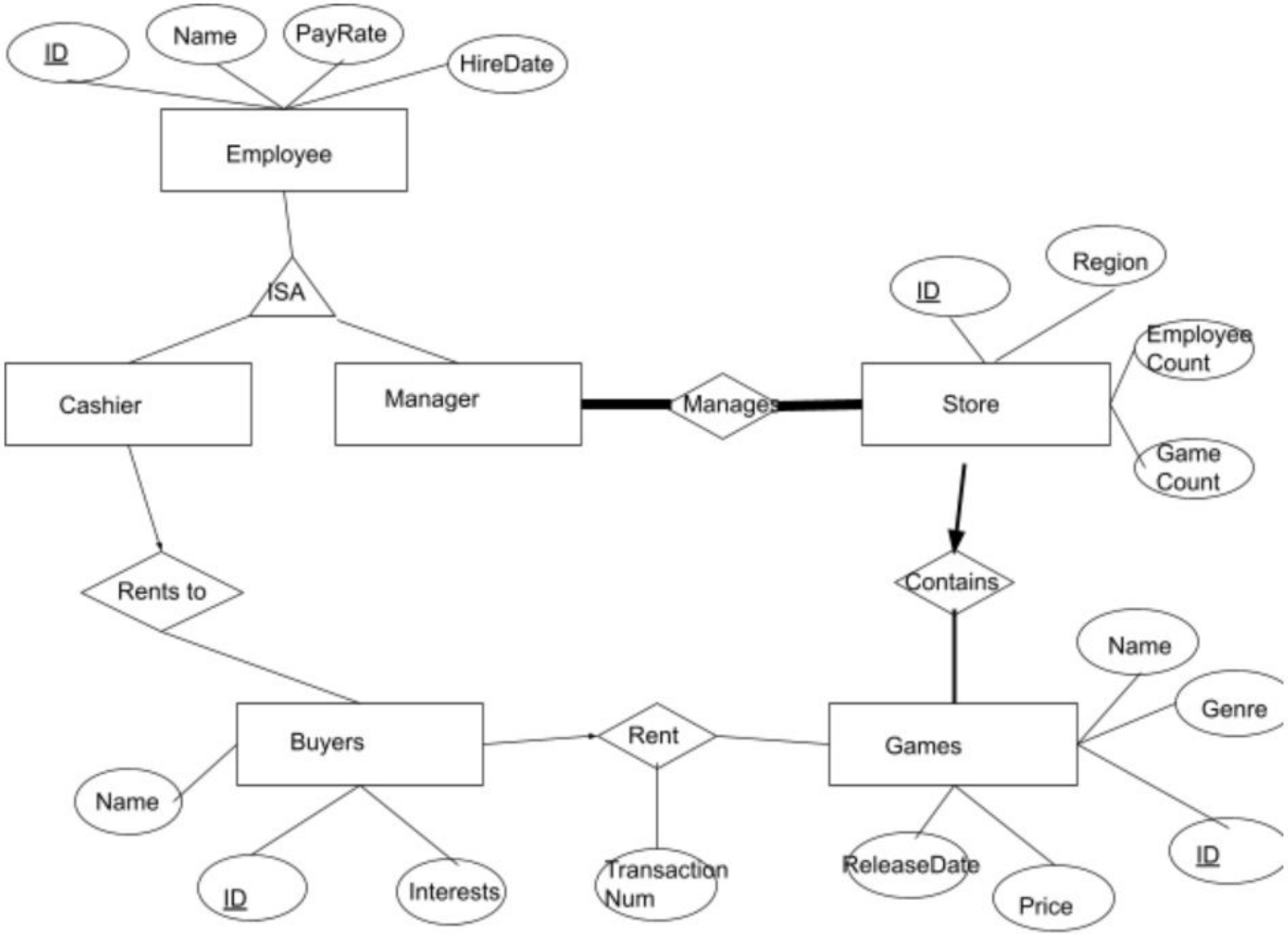
Separating staff from managers permissions - login specific to managers will have administrative permissions, but staff logins will not.

Overview of solution

1. Buyers rent games.
2. Buyers have names, ids, and interests.
3. Games have names, genre, ids, release dates, price, and rental length.
4. Cashiers rent games to buyers.
5. Cashiers have names, ids, hire date, and pay rate.
6. Cashiers can be managers or employees.
7. Buyers can rent from a network of stores.
8. Stores have regions, ids, staff count, game count, and manager.
9. Each store must have at least one manager and only managers can see pay rates and edit/add games.
10. Employees can rent games and view information about them, but not edit.

Requirements

1. Buyer registers with store in their region with name, and their interests.
2. Buyer can view name, genre, id, release date, price, and rental date of games they’re interested in
3. Buyer can search for games within the store to see if it is available
4. Everyone can sort and view games list by qualifiers (genre, release date, price)
5. Cashier or manager can check out the buyer if they have at least one game.
6. Buyer can ask for the cashier's name but not their id, hire date, or pay rate.
7. Everyone can see if a game is rented out (available)
8. Cashiers and managers can view all store information like region, id, staff count, game count, and manager.
9. Buyer can view store region and game count only.
10. Managers can edit inventory
11. Cashiers can view all game information but not edit the information


ID
Name
PayRate
HireDate
Employee
ISA
Cashier
Manager
Manages
Store
ID
Region
Employee Count
Game Count
Rents to
Contains
Buyers
Rent
Games
Name
Genre
ID
ReleaseDate
Price
Name
ID
Interests
Transaction Num

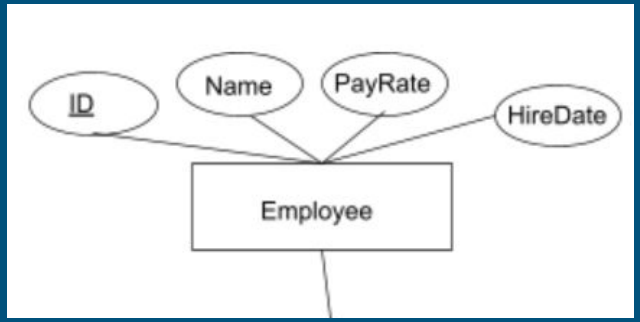
Redundancies and Method:

We broke up all the items and processes as we built the schema in the first place.

Instead of making everything attributes, we built everything to be self-contained. Therefore, when making the tables, there isn't very much overlap or redundancies between the tables.

Only one table contains a 'log' of information that has to be saved, and so is the only one that can contain redundancies by nature.

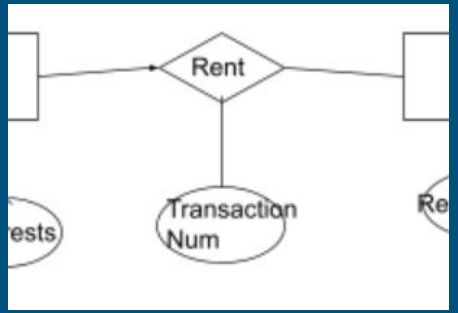
Employee Table



Employee(int eID, String name, int payRate, date hireDate)

CREATE TABLE Employee(INTEGER eID, VARCHAR(255) name, INTEGER payRate, TIMESTAMP hireDate, PRIMARY KEY(eID))

Rent Table



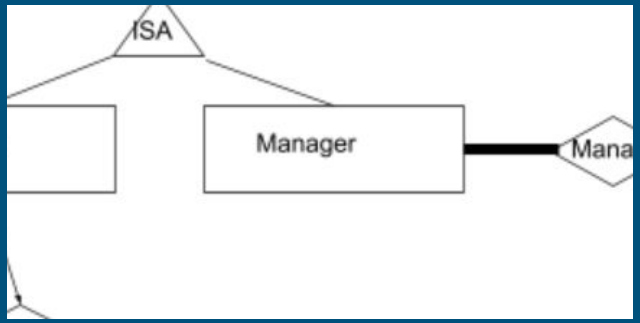
Rent (int transactionNum, int eID, int bID, int gID)

CREATE TABLE Rent (INTEGER eID, INTEGER bID, PRIMARY KEY(transactionNum), FOREIGN KEY(eID, bID, gID))

transactionNum -> eID, bID

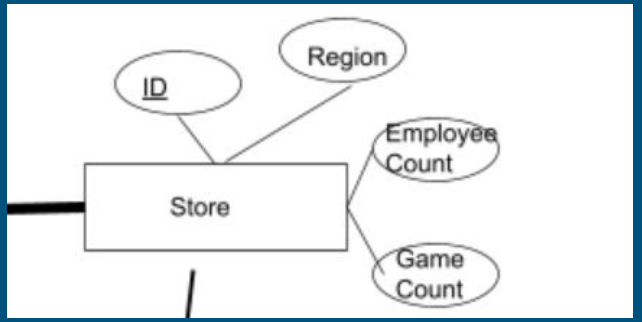
Manager Table

Manager (int eID, int sID)



CREATE TABLE Manager(INTEGER eID, INTEGER sID, PRIMARY KEY(eID, sID),
FOREIGN KEY(eID, sID))

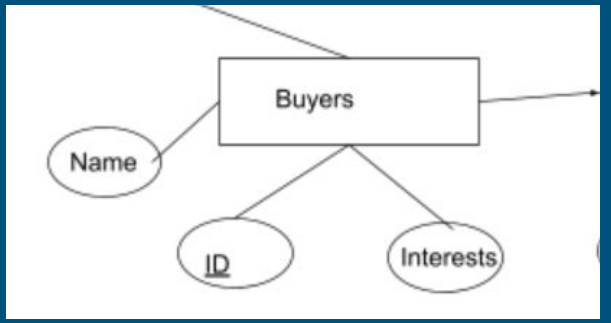
Store Table



Store(int sID, String region, int employeeCount, int gameCount)

CREATE TABLE Store (INTEGER sID, VARCHAR(255) region, INTEGER employeeCount, INTEGER gameCount, PRIMARY KEY(sID))

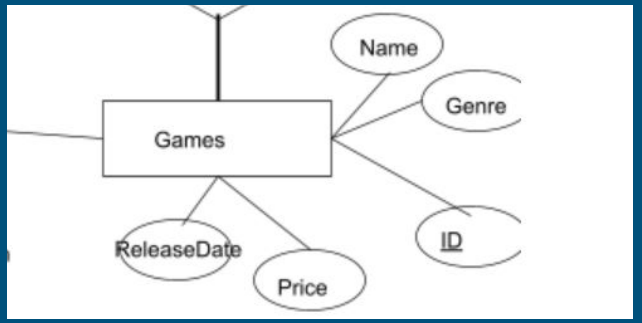
Buyers Table



Buyers(int bID, String name, String interests)

CREATE TABLE Buyers(INTEGER bID, VARCHAR(255) name, VARCHAR(255) interests, PRIMARY KEY(bID))

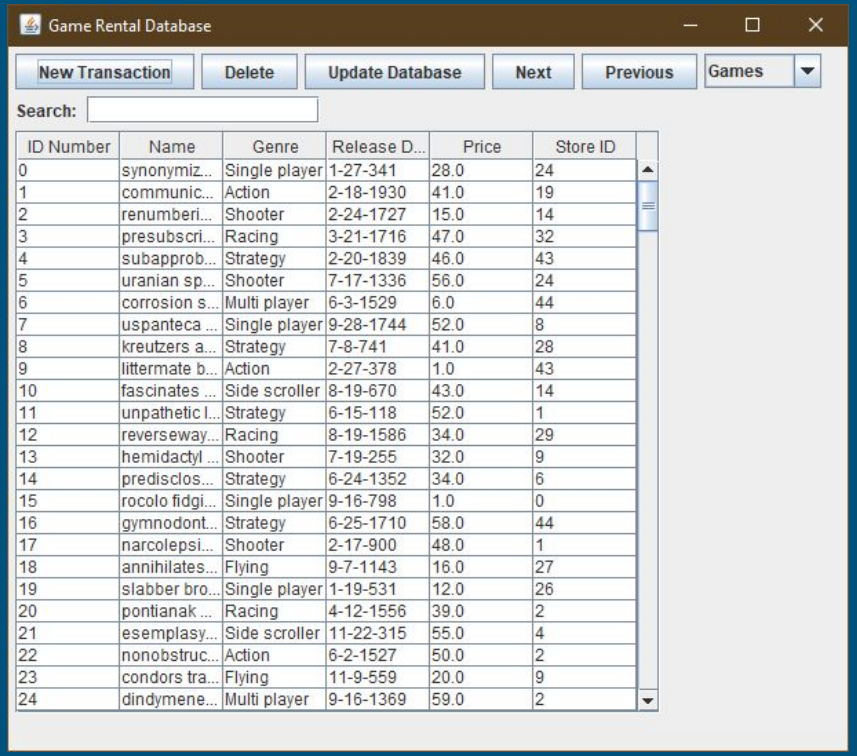
Games Table

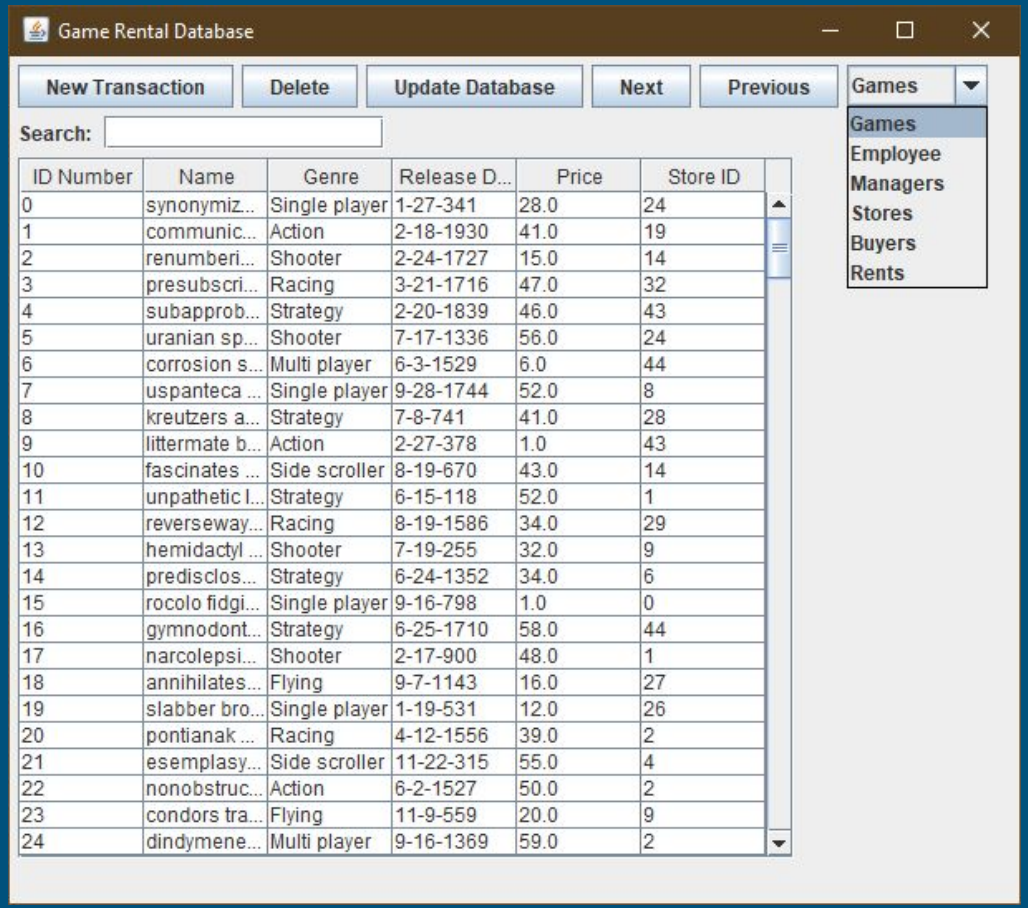


Games(int gID, String name, String genre, date releaseDate, double Price)

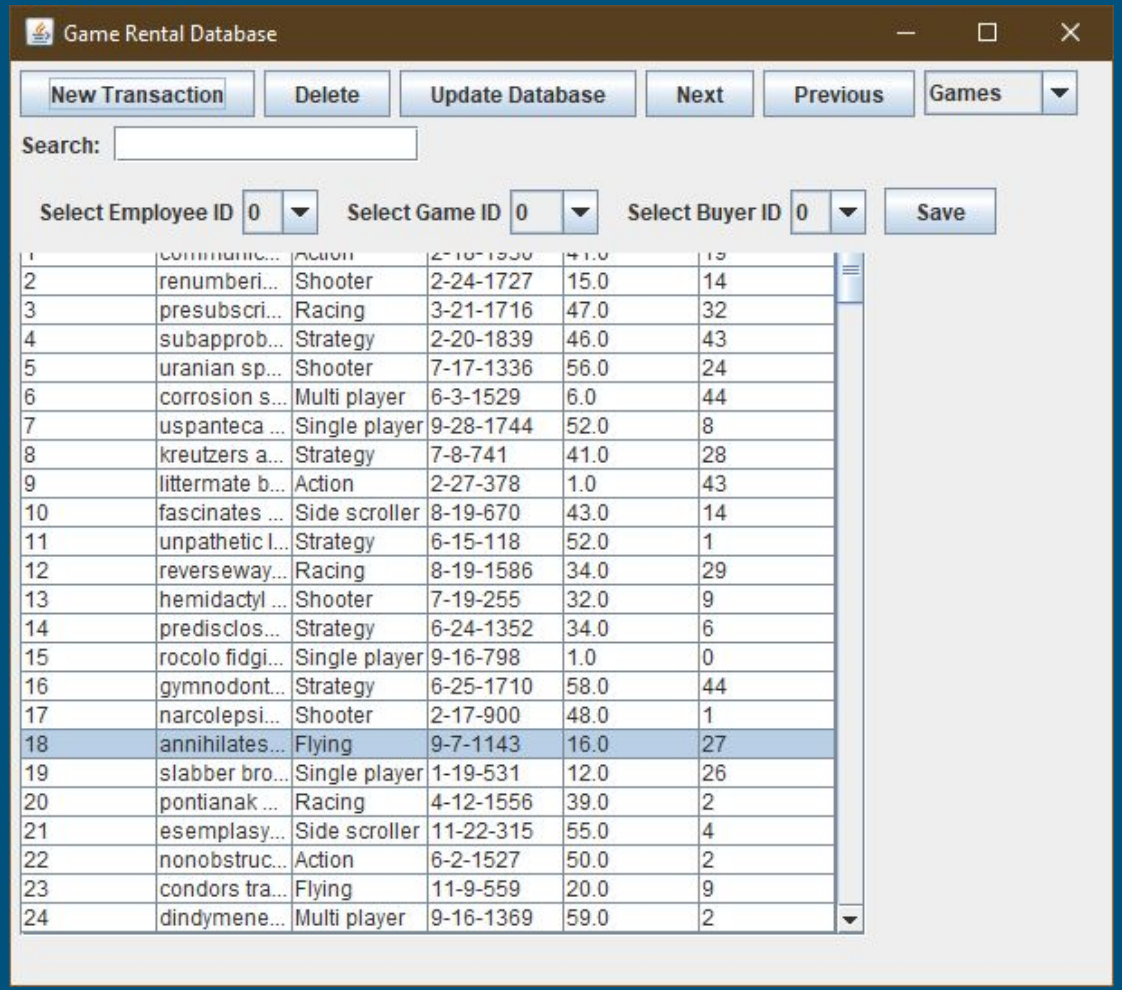
CREATE TABLE Games(INTEGER gID, VARCHAR(255) name, VARCHAR(255) genre, TIMESTAMP releaseDate, DOUBLE Price, INTEGER sID, PRIMARY KEY(gID), FOREIGN KEY (sID))

View Layouts



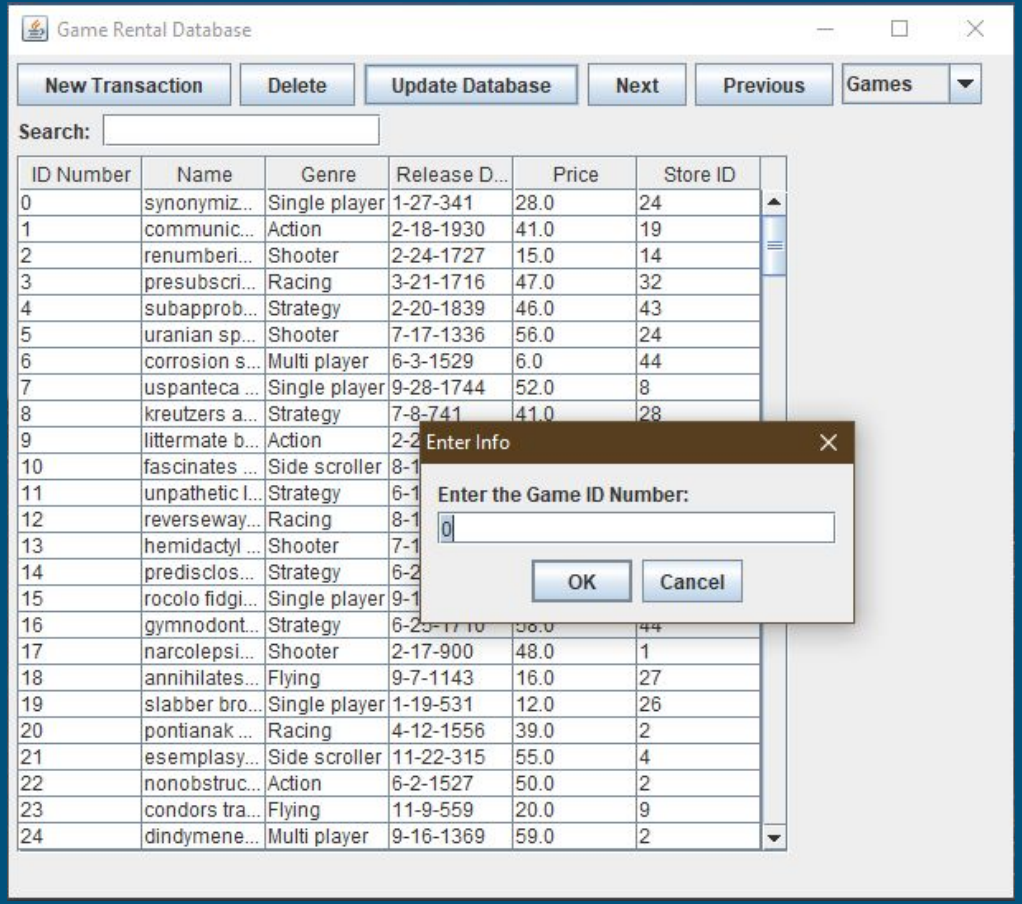


Adding Entries

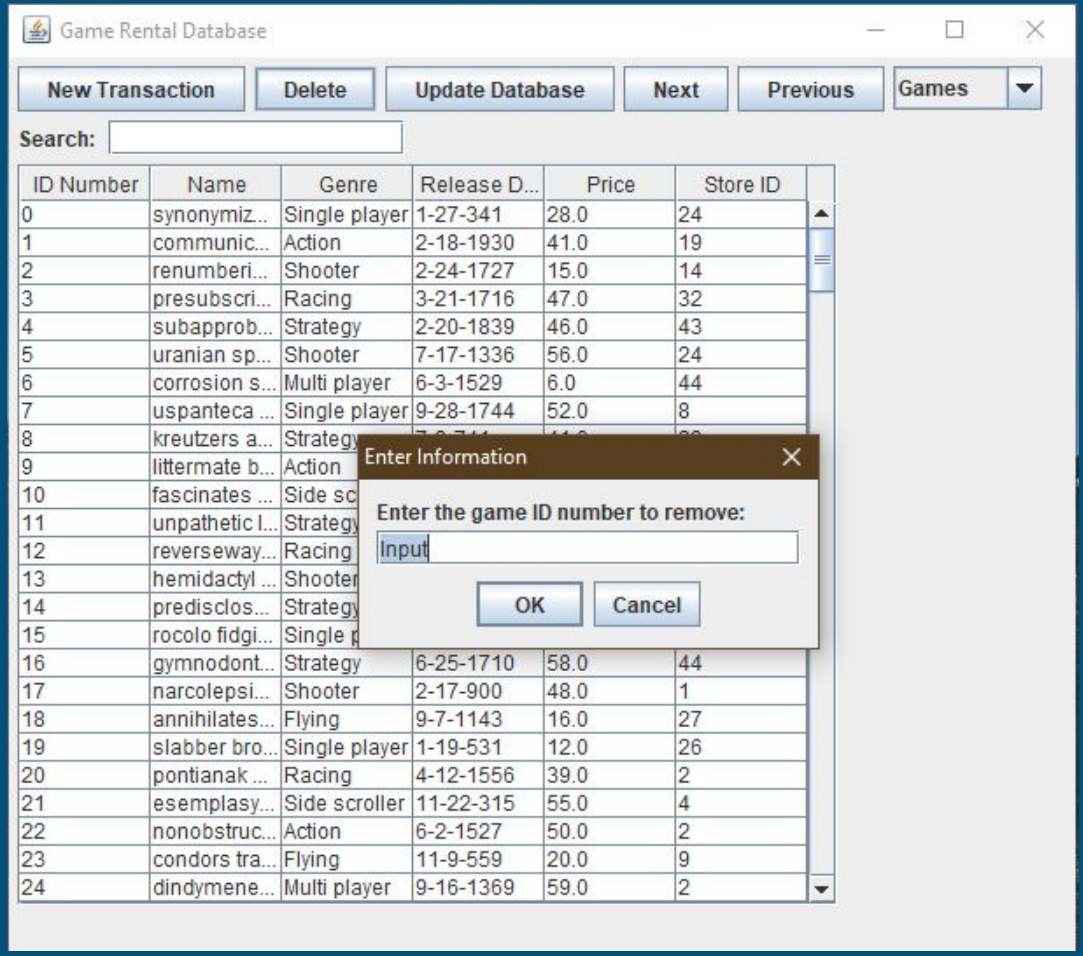


2	renumberi...	Shooter	2-24-1727	15.0	14
3	presubscri...	Racing	3-21-1716	47.0	32
4	subapprob...	Strategy	2-20-1839	46.0	43
5	uranian sp...	Shooter	7-17-1336	56.0	24
6	corrosion s...	Multi player	6-3-1529	6.0	44
7	uspanteca ...	Single player	9-28-1744	52.0	8
8	kreutzers a...	Strategy	7-8-741	41.0	28
9	littermate b...	Action	2-27-378	1.0	43
10	fascinates ...	Side scroller	8-19-670	43.0	14
11	unpathetic l...	Strategy	6-15-118	52.0	1
12	reverseway...	Racing	8-19-1586	34.0	29
13	hemidactyl ...	Shooter	7-19-255	32.0	9
14	predisclos...	Strategy	6-24-1352	34.0	6
15	rocolo fidgi...	Single player	9-16-798	1.0	0
16	gymnodont...	Strategy	6-25-1710	58.0	44
17	narcolepsi...	Shooter	2-17-900	48.0	1
18	annihilates...	Flying	9-7-1143	16.0	27
19	slabber bro...	Single player	1-19-531	12.0	26
20	pontianak ...	Racing	4-12-1556	39.0	2
21	esemplasy...	Side scroller	11-22-315	55.0	4
22	nonobstruc...	Action	6-2-1527	50.0	2
23	condors tra...	Flying	11-9-559	20.0	9
24	dindymene...	Multi player	9-16-1369	59.0	2

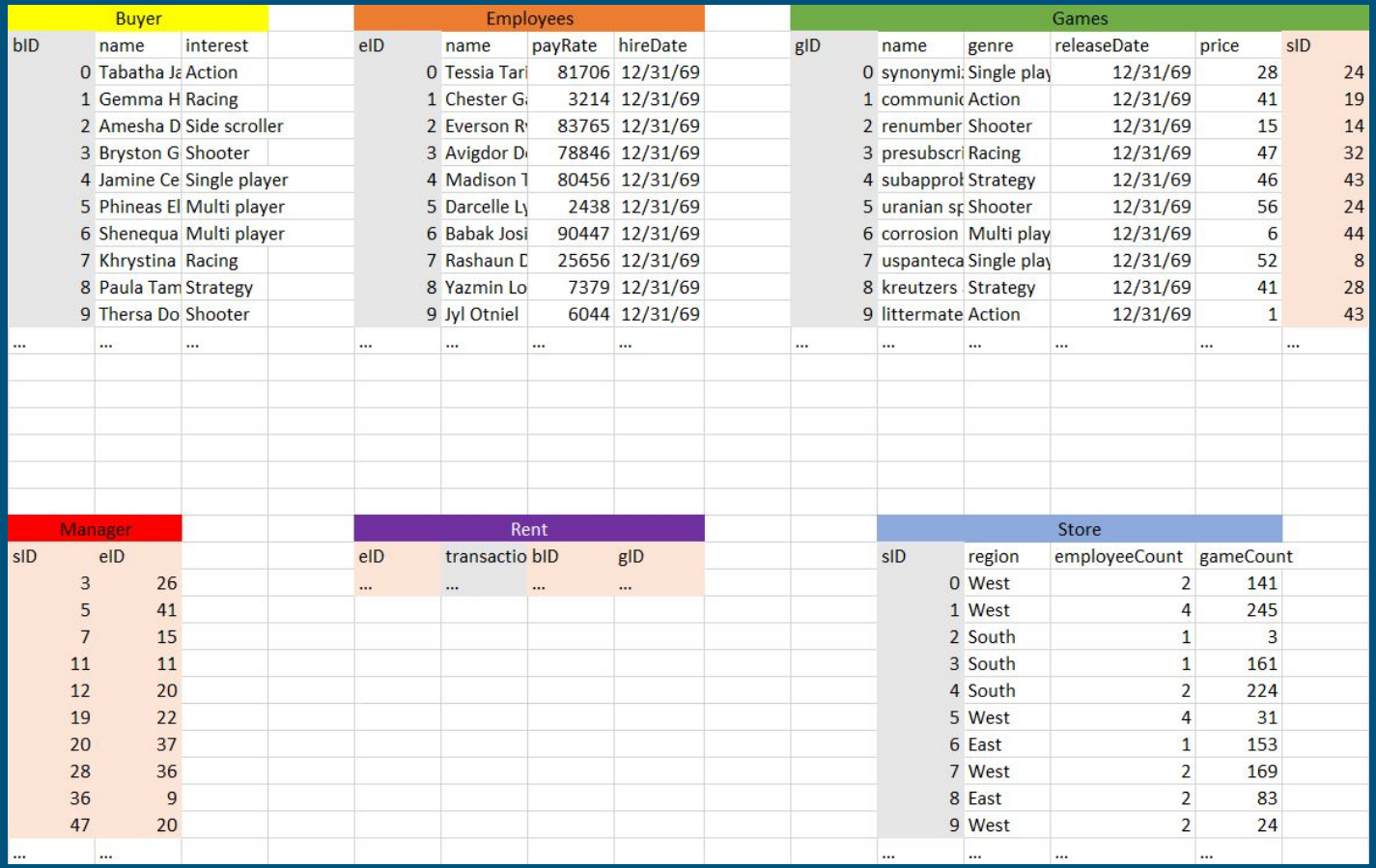
Modifying Entries



Deleting Entries



BCNF



Buyer

bID	name	interest
0	Tabatha Ja	Action
1	Gemma H	Racing
2	Amesha D	Side scroller
3	Bryston G	Shooter
4	Jamine Ce	Single player
5	Phineas El	Multi player
6	Shenequa	Multi player
7	Khrystina	Racing
8	Paula Tam	Strategy
9	Thersa Do	Shooter
...	...	...

Employees

eID	name	payRate	hireDate
0	Tessia Tari	81706	12/31/69
1	Chester Ga	3214	12/31/69
2	Everson R	83765	12/31/69
3	Avigdor D	78846	12/31/69
4	Madison T	80456	12/31/69
5	Darcelle Ly	2438	12/31/69
6	Babak Josi	90447	12/31/69
7	Rashaun D	25656	12/31/69
8	Yazmin Lo	7379	12/31/69
9	Jyl Otniel	6044	12/31/69
...	...	...	...

Games

gID	name	genre	releaseDate	price	sID
0	synonymi	Single play	12/31/69	28	24
1	communic	Action	12/31/69	41	19
2	renumber	Shooter	12/31/69	15	14
3	presubscri	Racing	12/31/69	47	32
4	subapprol	Strategy	12/31/69	46	43
5	uranian sp	Shooter	12/31/69	56	24
6	corrosion	Multi play	12/31/69	6	44
7	uspanteca	Single play	12/31/69	52	8
8	kreutzers	Strategy	12/31/69	41	28
9	littermate	Action	12/31/69	1	43
...	...	...	...	...	...

Manager

sID	eID
3	26
5	41
7	15
11	11
12	20
19	22
20	37
28	36
36	9
47	20
...	...

Rent

eID	transactio	bID	gID
...	...	...	...

Store

sID	region	employeeCount	gameCount
0	West	2	141
1	West	4	245
2	South	1	3
3	South	1	161
4	South	2	224
5	West	4	31
6	East	1	153
7	West	2	169
8	East	2	83
9	West	2	24
...	...	...	...