CS 340 Project: Game Library
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Game Library Web App

Project Outline

At Nathan's work, there is an extensive library of video games that employees can check out for free and return whenever convenient. Currently, the library is managed by one person, manually on an Excel spreadsheet. We will work on a game library web app that can be used by employees to examine the current library inventory and to make requests. The heart of the web app will be a database that contains all the information about the users, games, game metadata, platforms and requests.

The project will be written in node.js, HTML and CSS. We will use hand-written MySQL queries to manage all database access and modifications.

Project Deployment

- Our site is deployed at the URL below. **YOU MUST BE ON OSU VPN!**
    - http://flip1.engr.oregonstate.edu:7843/
- Please note that some backend functionality is implemented but other portions of the project are unfinished.
- Our game_request entity does not have an explicit creation form because a new game_request is generated by clicking the request button on the Library page.
- Login does not work yet.
- Most of the tables can be viewed by going to the admin tab (no authentication required yet).

Project Step 3 Feedback and Fixes

Feedback by the peer reviewers

Peer Review 1

1. Are the queries syntactically correct?

   Yes, all the queries reviewed are syntactically correct. The insert script functioned as required which reflects the INSERT statements in the data manipulation queries. The other queries function as expected.
   A couple items to keep in mind.
   If the attribute is the same as the alias there should not be any reason to alias it, e.g. GR.boxart_url AS boxart_url – this should already return boxart_url.
   You might want to add a table for game statuses. This is a simple change but is cleaner than storing a string. Not a big deal on this project but in the future if you ever want to add a new status you can simply add it to the database. This is much easier to work with in code when using an ORM as well.
   When searching and using an OR with LIKE just be careful. There should not be an issue with you current queries but be aware of when to use DISTINCT.
   I tried to delete a user and couldn't because of a foreign key. This may be expected of course, just double check cascades. If I am a user and want to delete my account there should be no issue if the request is pending or completed, but if I have something checked out it should be restricted. This can be handled in code instead of the backend through a conditional check but just something to be aware of.

2. Are there queries providing all functionalities as required by the CS340 Project Specs ?
   Yes, the queries provide all the necessary functionality a noted in the project specs.

3. Does each functionality listed in the CS340 Project Specs have a corresponding HTML page? (It's okay to implement multiple functionalities on the same HTML page)
   Yes, everything is already set up and functional beyond the requirements.

4. Is there a better way that data could be displayed on SHOW functionality pages?
   Everything looks good the way it is displayed. Without getting into UI and usability the website functions as expected and looks clean.

5. Is there a better way that the forms for UPDATE and ADD functionalities could be implemented?
   The forms could just be width limited rather than stretching across the entire screen. That is just personal preference. The view users could be cleaned up and placed in a

template to display each user in its own user card or something. However, the site looks great and functions beyond the expected requirements.

Peer Review 2

1. Fantastic progress! Are the queries syntactically correct?
   -It appears so.

2. Are there queries providing all functionalities as required by the CS340 Project Specs ?
   -Yes

3. Does each functionality listed in the CS340 Project Specs have a corresponding HTML page? -No
   -> How do you delete a user on your website?
   -> How does user update password?
   -> How do you mark a game as returned?
   -> How do you delete a request that a user no longer wants?
   -> How do you assign game copy to game request?

4. Is there a better way that data could be displayed on SHOW functionality pages? Is there a better way that the forms for UPDATE and ADD functionalities could be implemented?
   - I think update and delete functionality needs to be implemented on website.

5. General Feedback
   - When you click request, for the confirmation at the top, it is probably better to confirm the name and not the id. A user won't know the game id.
   - I'm not sure your logic for requests queue is correct. I submitted request but did not see it in unfulfilled request queue.
   - For game releases, game requests, and game copies, I assume you want some method in the admin portal of viewing each of these tables.
   -I assume you will also want a query to show which user has which game checked out
   -Game library vs Library at top is confusing. Maybe Game Library should be renamed about and Library renamed to Game Library?
   -You may want some method in library to indicate to user that a game is not available (button that shows it is checked out)

Actions based on the feedback

1. Removed extraneous aliases in our queries.

2. Regarding deleting users: we've decided to add another user role, "disabled", to remove users from the current users as we do not see a reason to completely delete a user from the system. This is non-essential so we will do it later.
3. Regarding the styling changes suggested, we've adjusted the form widths. We did not change the users view, as it's an admin-only page.
4. Regarding missing functionalities, we've created admin abilities to check-in (return) copies, check-out copies (assign them to a request). We've also added the ability for a user to update their password and to cancel their pending requests.
5. Regarding viewing all tables, we've added those views to the admin page.
6. Regarding the user view of the library, we will be adding the ability to filter by what's currently available to check out at a later project step, when we focus more on usability.
7. Regarding library naming and confirmation messages, we will be adding the ability for the admin to configure the app name and logo in the config.json.

Upgrades to the Draft version

1. We have moved all our routes into separate files so that they do not clutter app.js.
2. We moved the database connection into a separate file so it can be included in multiple places.
3. We changed our get_all_game_requests query to get_game_requests_by_status, which allows us to filter by status or not.
4. Added queries for
    a. Get_game_requests_by_user
    b. Get_user_by_id
    c. One query for each entity to fill out the admin indexes.
5. Added new pages and routes for user profile.
6. Added admin index views
    a. Titles, Releases, Platforms, Copies
    b. Requests by status
7. Created an issue to add a "cancelled" status to our game requests, so that a user can cancel a request they no longer want.

Project Step 2 Feedback and Fixes

Feedback by the peer reviewers

Peer Review 1

The ER diagram was well designed with all the attributes and tables present that were defined in the project description. The primary keys were underlined and the relationships between the tables were accurate according to the outline.

The schema was also well designed with no error that I could see.

The SQL file ran with no issues, was syntactically correct, and possessed all the required attributes and tables that were described in the project description.

Peer Review 2

1. Are the attributes for each entity in the ERD same as that described in the database outline? Perhaps, There is a difficulty with the release id. I see release date; however, I am not sure if that is the release id. The descriptor for the release id is confusing as to what it connects to. There is a confusing id, called title id, I do not see it in the ERD. Platform_ID is stated as an attribute however I do not see it in the ERD. However, I believe there might be some confusion in regars to what a foreign key would look like in an ERD. So I am aware of there existence through the schema and not ERD

2. Is the participation of entities in the relationships same as that described in the outline? Yes the relationships demonstrate what the outline had described.

3. Is the cardinality of entities in the relationships same as that described in the outline? Yes the cardinality matches the outline

4. Is there something that could be changed/improved in the E R Diagram and/or the overall database design? I would suggest that the relationships demonstrate which item is connecting them, and showing how the foreign key relates to other entities.

The best peer review for a Schema would answer all of the following questions:
1. Are the relationship tables present where required and correctly defined, when compared with the database outline? Yes the schema has all the information that the outline states, and also has demonstrates the relationships.

2. Are foreign keys present where required and correctly defined, when compared with the database outline? Yes the foreign keys are present and point to the accurate entity.

3. Do the entity attributes match those described in the outline? Yes the entities show all the attributes that were declared in the outline.

4. Is there something that could be changed/improved in the Schema and/or the overall database design? I think it looks great, it even has the lines that overlap to show a line is unique to an entity.

The ideal peer review for a DDQ file would answer all of the following questions:
1. Is the SQL file syntactically correct? This can be easily verified by importing/copy-pasting it in phpmyadmin. (Do not forget to take backup of your own database before you do this!) The SQL file is syntactically correct. It runs without any errors.

2. Are the data types appropriate considering the description of the attribute in the database outline? Yes the attributes are similar to how it has been defined in the outline.

3. Are the foreign keys correctly defined when compared to the Schema? Yes each foreign key is present and works correctly.

4. Are relationship tables present when compared to the ERD/Schema? Yes the tables are present and seem to work properly.

Peer Review 3

ERD
Your outline defines the cardinality of Game Release to Users a many to many but you used a cardinality of N. This should be M since the user could have 0 game releases.
Wrong notation for 1 to many relation between Game Requests and Game Copies. You used a P when it should be M.

Schema
Your foreign keys need to be underlined in Game Request, Game Release, and Game Copy.

DBQ
None of the tables are populated as required by the project. “Sample Data: And we also need you to submit INSERT queries to populate your Project database with sample data. All data types should be appropriate, foreign keys should exist and be correct and it should match the database outline, schema, and ERD that you submit. Again, these sample data statements should be easily run-able as stated above.”

Game Copies Table Library_tag is defined as being UNIQUE in your table but your outline does not define it as such. Outline does not define length of library_tag. Table has it set to 255. Dt_created and dt_upadated are not defined in your outline or ER Diagram for game copies. Game Platforms Table Dt_created and dt_updated are not defined in your outline or ER Diagram for game platform Outline does not have defined sizes for varchar of length 255 for both Name and Manufacturer. Table has them set to 255.
Game Releases Table Rating is able to be set to NULL but is not defined as such in outline. Boxart_url varchar of length 255 length is 255 but is not defined as such in outline. Dt_created and dt_upadated are not defined in your outline or ER Diagram Game Request Table Dt_created and dt_upadated are not defined in your outline or ER Diagram Game Titles Table Name uses varchar of length 255 of size 255 but is not defined as such in outline. Name is specified as being unique but not defined as such in outline.
Genre uses varchar of length 255 of size 255 but is not defined as such in outline. Developer uses varchar of length 255 of size 255 but is not defined as such in outline.
Producer uses varchar of length 255 of size 255 but is not defined a such in outline. Dt_created and dt_upadated are not defined in your outline or ER Diagram Users Table First_name, last_name, e-mail, password, password_salt all use varchar of length 255 of size 255 but this is not defined in the outline. Dt_created and dt_upadated are not defined in your outline or ER Diagram.

Actions based on the feedback

1. Regarding the foreign keys missing from the ERD, we decided not to take any action after doing additional research to confirm that foreign keys belong in the schema, but not the ERD.
2. Regarding the cardinality of relationships in the ERD, we decided not to take any action as it seems the reviewer is mistaken about notation practices. M, N, and P are all used to represent “many” relationships and signify that they can all be different numbers.
3. Regarding the suggestion to underline foreign keys in the schema, we decided not to take any action, citing the examples given in our class lectures.
4. Regarding the tables not being populated, we rectified the situation to meet the project specifications.
5. Regarding the many attribute parameters and constraints present in our DDQ but missing from our outline, we have added those parameters and constraints to the outline for consistency.
6. Regarding the dt_created and dt_updated attributes, while we feel that these are purely for maintenance and don’t describe the entities, we’ve decided to err on the side of caution and include them in the schema and ERD.

Upgrades to the Draft version

1. Removed password_salt attribute from user entity since it is not needed when using bcrypt.

2. Changed game_request.game_id to game_request.copy_id for consistency.
3. Changed game_releases.rating to DECIMAL(5,2).

Project Step 1 Feedback and Fixes

Feedback by the peer reviewers

Note on Peer Feedback

The feedback we received was for our initial project idea based on a database for the video game, **Stardew Valley**. We decided to change our project so this feedback no longer applies. Below, we have included our feedback from the last project and our responses to that feedback, just in case it is required for grading. Then, we provide the justification for our project change.

Feedback by the peer reviewer

1. Are there sufficient entities as required?
Yes. Heather and Nathan have 6 entities (required: 4).
2. Are there sufficient number and types of relationships as required ?
Yes. The Villagers <-> Gems relationship satisfies the many-to-many requirement.
3. Is there a good reason to have the things described as entities to be entities? Or can they be just attributes of other entities?
Locations is an entity that was a bit confusing to me. For Villagers, the home attribute links to the Locations entity. However, for Players, the farm attribute (which seems to also represent a location) does not link to the Locations entity. I wasn't able to discern the difference. You may want to consider making location an attribute linking to the Locations entity for both (or neither and remove the Locations entity).
4. Do the various relationships make sense to you ?
"Buildings & Animals are owned by one Player, and a Player can own many animals (one-to-many)"
You may want to break Buildings and Animals up into separate points or include a description of the Player to Buildings relationship like you did for Player and Animals in the latter half of the description.
5. Is there sufficient information about each attribute to justify it's presence ?
Yes. I feel like I have a good picture based on the description of each attribute.
6. Are the data types mentioned for attributes ? It need not be an actual keyword from MySQL/MariaDB like "varchar" but is it sufficiently described as a string, number, date, etc?
Yes, data types are specified.
7. Do the data types make sense for the attributes?

Yes.
8. Are constraints described for attributes? Do they make sense ? The implementation details of the constraints do not matter right now.
Yes, constraints are described. The max char for name (15) seemed a bit low to me but not being familiar with the game, I can't say for certain.
9. Is there anything else that you wish the student did to make their outline better and more suitable for a CS340 Project?
The outline was well thought out and suitable for a CS340 Project.

Actions based on the feedback

Although we changed our project entirely, here are our responses to the actions that were suggested to our original project. We didn't feel that any action was necessary but will offer clarification.

1. Regarding the comment on the max char for a name being 15 characters, it is only intended to hold a first name and it needs to be easy enough to display frequently.
2. Regarding the locations entity, a location is intended to describe an area outside the user's farm. The user's farm is special in that it is customizable by the player.
3. Regarding the relationship between animals, buildings, and players, players own buildings. A building is located on the player's farm, and can only be owned by one player, however there can be many buildings owned by one player. Animals simply live inside those buildings. This eliminates the direct relationship between players and animals.

Upgrades to the Draft version

We decided to change our project from a database representing the game **Stardew Valley** to this game library project because we felt that we wanted to complete a project that would demonstrate higher level skills and be more impressive on our resumes. The game library project is an improvement because:

1. It will be used by people in the real world, requiring us to make real decisions about which features that people will find useful. We will also be externally motivated to maintain it and fix bugs as necessary.
2. It has the potential to pull in data via real-world APIs (MobyGames) or through screen/DOM scraping (game review sites), demonstrating skills that are desirable in the job market.

Database Outline

Entities

- **All Entities:**
    - All entities will have these fields:
    - id: an auto-incremented int(11) identifying the user; cannot be NULL; used as the primary key
    - dt_created: current timestamp marking when the entity was created, cannot be NULL
    - dt_updated: current timestamp marking when the entity was last updated, cannot be NULL

- **Users:**
    - Describes a user of the web app and their role.
    - first_name: a varchar of length 255 string containing the user's first name; cannot be NULL
    - last_name: a varchar of length 255 string containing the user's last name; cannot be NULL
    - email: a varchar of length 255 string containing the user's email; cannot be NULL. Is Unique.
    - password: a varchar of length 255 string containing the user's hashed password; cannot be NULL
    - role: an enum describing the user's role. Cannot be NULL
        - 'User', 'admin', 'root'
- **Game_Copies:**
    - Describes an actual physical copy of a video game that is in the library.
    - status: an enum describing the status of this copy; cannot be NULL
        - Available, checked_out, lost
    - release_id: a foreign key linking a copy of a game to the metadata about a release of that game; cannot be NULL.
    - library_tag: a varchar of length 255 containing the library tag that is stuck to the game box; cannot be NULL
    - dt_procured: a date field containing the date this copy was purchased; can be NULL.
- **Game_Titles:**
    - Describes metadata related to a game title, but not a specific platform.
    - name: a varchar of length 255 string containing the game's name; cannot be NULL; must be unique
    - description: a TEXT field containing a description of the game; can be NULL

    - genre: a varchar of length 255 string containing the game's genre; can be NULL
    - developer: a varchar of length 255 string containing the game's developer; can be NULL
    - producer: a varchar of length 255 string containing the game's producer; can be NULL

- **Game_Platforms:**
    - Describes a game platform, like a specific console family or a PC.
    - Name: A varchar of length 255 string with the name of this platform; cannot be NULL. Is Unique.
    - Manufacturer: A varchar of length 255 string with the manufacturer of this platform; can be NULL
    - Release date: A date field with the release date of this platform; can be NULL

Relationships

- **Game_Releases - game_titles, and game_platforms**
    - Many-to-many relationship between game_titles and game_platforms.
    - A game_Title can have many game_platforms through game_releases.
    - A game_platform can have many game_titles through game_releases.
    - Contains additional data about the release, with the following attributes:
        - title_ID: A foreign key linking a game release to GameTitle about that release; cannot be NULL
        - platform_ID: A foreign key linking a game release to the platform of that release; cannot be NULL
        - release_date: A date field representing the release date; cannot be NULL
        - rating: a decimal field representing the review score of this release; can be NULL.
        - boxart_url: A varchar of length 255 string with a URL link to boxart for this release; can be NULL

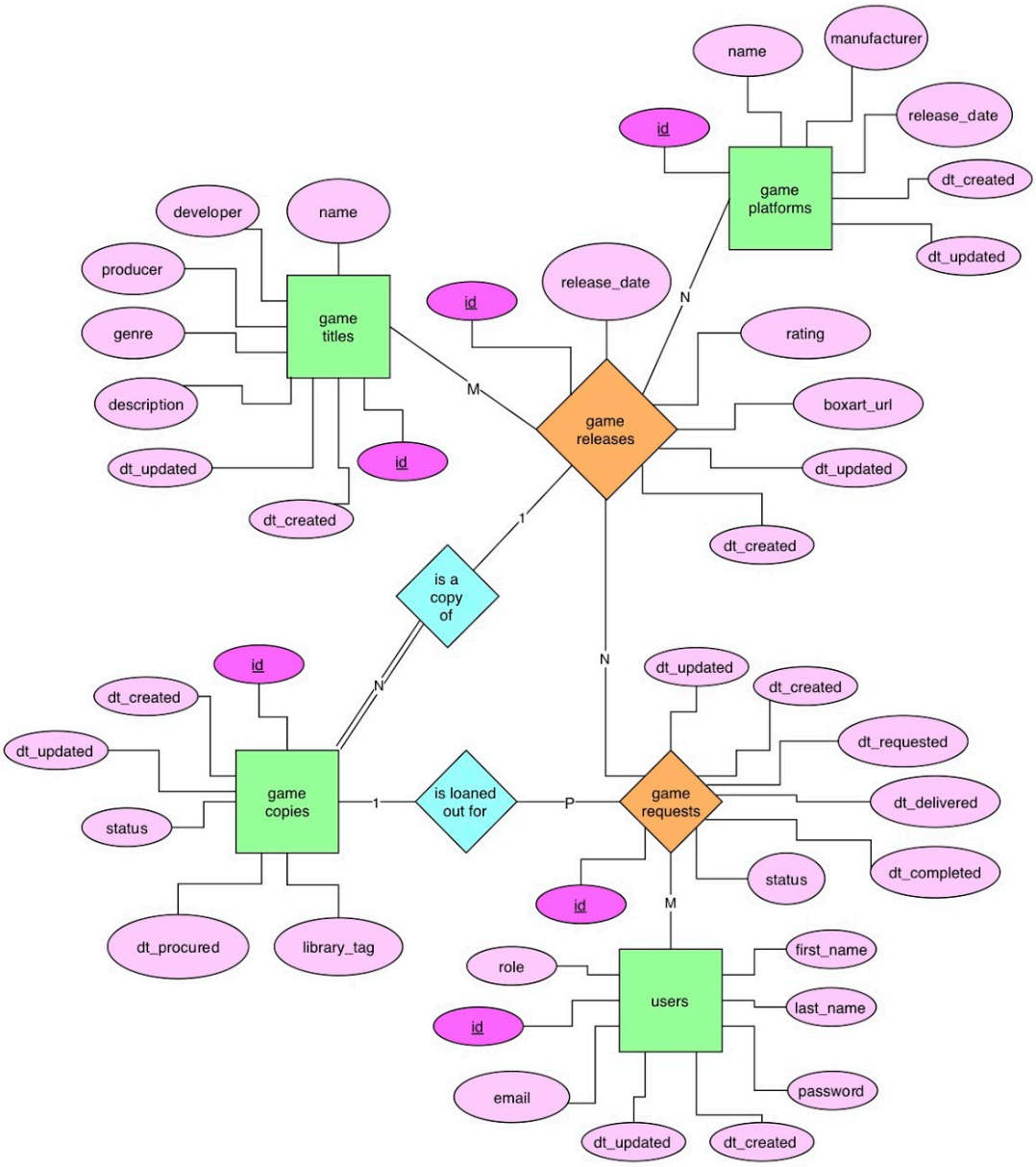
- **Game_Requests - users, game_releases**
    - Many-to-Many relationship involving users and game_releases, describing a request made by a user to borrow a game, and the status of that request until completion.
    - A user can make many requests for a game_release.
    - A game_release can have many requests by many users.
    - Contains additional data about the request, with the following attributes:
        - user_ID: foreign key linking a request to a specific user. Cannot be NULL
        - release_ID: foreign key linking a request to a release of a game. Used for the request initially, before an actual copy of the game is delivered. Cannot be NULL

        - copy_ID: foreign key linking a request to a specific copy of a game, once it has been delivered. Can be NULL
        - dt_requested: datetime field for when the game was requested by the user; can be NULL
        - dt_delivered: datetime field for when the game was delivered to the user; can be NULL
        - dt_completed: datetime field for when the game was returned to the library or the request cancelled; can be NULL
        - status: an enum describing the status of the request. Cannot be NULL
            - 'pending', 'checked_out', 'completed'

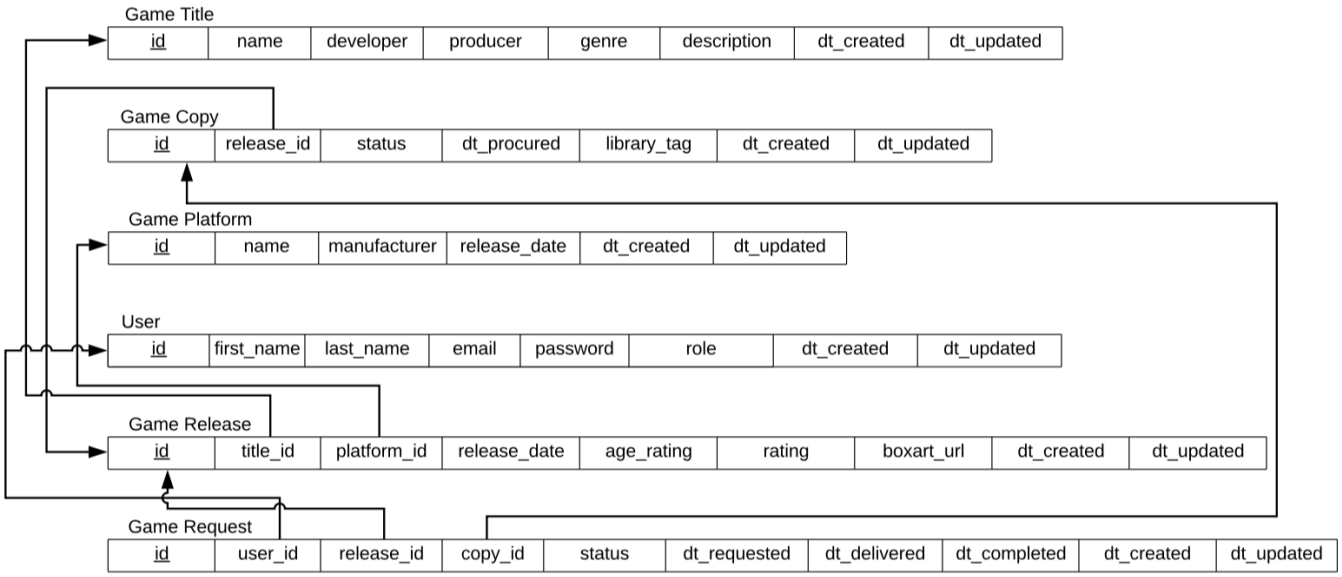
- **Adding a game to the library - game_copies and game_releases**
    - One to many relationship involving a game game_release and a game copy.
    - A game_copy must be a purchased physical copy (instance) of a game_release.
    - A game_release can have many purchased copies.

- **Loaning a game out - game_requests and game_copies**
    - One-to-many relationship involving a game_request and a game_copy.
    - A game_request can be fulfilled by loaning out one game_copy.
    - A game_copy can fulfill many requests (one at a time).

Entity-Relationship Diagram



Schema


Game Title
id
name
developer
producer
genre
description
dt_created
dt_updated
Game Copy
id
release_id
status
dt_procured
library_tag
dt_created
dt_updated
Game Platform
id
name
manufacturer
release_date
dt_created
dt_updated
User
id
first_name
last_name
email
password
role
dt_created
dt_updated
Game Release
id
title_id
platform_id
release_date
age_rating
rating
boxart_url
dt_created
dt_updated
Game Request
id
user_id
release_id
copy_id
status
dt_requested
dt_delivered
dt_completed
dt_created
dt_updated