

# CPSC 304 Project Cover Page

Milestone #: 4

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Group Number: 51

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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

## CPSC 304 Milestone 4

- GitHub Repo Link
- [https://github.students.cs.ubc.ca/CPSC304-2024S-T2/project\\_e1h8m\\_i6m6h\\_t9n6o](https://github.students.cs.ubc.ca/CPSC304-2024S-T2/project_e1h8m_i6m6h_t9n6o)

### Project Description

1. The Game State Management Project encompasses the entire game state of an Uno Game. For example, the cards held by each player, the type of cards held by each player, the cards remaining in the deck, and whose turn it is. A real-life situation would, of course, be a group of individuals engaged in a (virtual) game of Uno. This addresses the issue of tracking game states. In addition to this, we are also able to track active players (and information about them, such as their countries), active memberships pertinent to players. Furthermore, we also offer an Items and Store functionality that allows User's to make purchases and access their stores.
2. Database Structure:
  - The database, UNOGameSystem, includes tables to store player information, match details, player involvement in matches, items, and other game-related data. Events are also accounted for,
  - Primary tables include PlayerUsernameAndEmail, Players, Matches, PlayerInvolveMatches, HandBelongsToPlayerAndMatch, and several others responsible for managing in-game items and events.
3. Players Management:
  - PlayerUsernameAndEmail: Stores usernames and corresponding emails.
  - Players: Contains detailed player data including total wins, total games, experience points, win rates, country, and passwords. The table references PlayerUsernameAndEmail and PlayerLevel.
4. Membership Management:
  - The system manages player memberships through tables like MembershipPrivilegeClass and Memberships, tracking membership levels, issue and expiration dates, and player privileges.
5. Events Management:
  - Events: Manages event details, participation, and status, ensuring all event-related activities are easily trackable.
6. Matches and Participation:
  - Matches: Records match details such as start and end times, winner, and status.
  - PlayerInvolveMatches: Tracks players involved in specific matches.
7. Player Experience and Levels:
  - PlayerLevel: Maps experience points to player levels, ensuring experience points do not exceed 10,000. This references the Players table.

8. Item and Store Management:
- Items and related tables  
(ItemOriginalPrice, ItemDiscount, StoreSellItems, PlayerContainItems)  
manage in-game items, their prices, promotions, and which stores sell them, to Players. Different players can access different stores that are associated with them.

## Schema Changes

1. We removed some entities & relationships that are unnecessary to be included in this system since we only have limited time to complete this project.
  1. Removed entities: LuckyDraw and Character and all relationships involving those entities.
2. We denormalized (joined) several relations representing the Membership entity, as changing the issue/expiration date of one membership should not influence other users' memberships.
3. We changed the Membership entity into a normal entity with a one-to-one relationship with the player. Because one player can have at most one membership.
4. For the ISA relationship between different types of actions, we simplified them to a single table with some redundancy for easier interaction and display.

For more specificity, the primary changes are (though some of this may be redundant):

- > Event now has attributes StartDate, EndDate, Status, NumOfParticipants.
- > Membership now has Status, and DaysRemaining and TotalPoints has been removed.
- > Membership is no longer a weak entity and has a Foreign Key Constraint.
- > For Player, EXP has been renamed to ExperiencePoint; Password has been added, and PreferredLanguage has been removed.
- > For Turn, we have added Turnstamp, and dismantled Action to simplify ER Diagram.
- > For Draw, we have added DrawAmount and removed its relation to Deck.
- > Play is connection to an Aggregation now.
- > Card has a new attribute: IsCardInDeck.
- > The Character entity has been excised, along with redundant attributes like CharacterID, Price, and Name, and so have been the relevant relations. Player has taken over its functionality.
- > Some name changes which are easily inferrable.

As for the why: project complexity was too high to maintain, and this still achieves our main objective (outlined above), though it is much simpler. Progression in the course played a part, most definitely.

## Final Schema Screenshot

Name	Engine	Version	Row Format	Rows	Avg Row Length	Data Length	Max Data Length	Index Length	Data Free	Auto Increm...	Create Time	Update Time	Check Time	Collation
CardBelongsToDeck	InnoDB	10	Dynamic	108	151	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
CardHeldByHand	InnoDB	10	Dynamic	14	1170	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
CardDrawnInTurn	InnoDB	10	Dynamic	6	2730	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Decks	InnoDB	10	Dynamic	0	0	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	2	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
DrewCard	InnoDB	10	Dynamic	8	2048	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
DrawAction	InnoDB	10	Dynamic	2	8192	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Events	InnoDB	10	Dynamic	21	780	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	22	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
HandBelongsToPlayerA...	InnoDB	10	Dynamic	2	8192	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	3	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
ItemDiscount	InnoDB	10	Dynamic	8	2048	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
ItemOriginalPrice	InnoDB	10	Dynamic	5	3276	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Items	InnoDB	10	Dynamic	26	655	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	26	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Matches	InnoDB	10	Dynamic	0	0	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	2	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
MatchHasDeck	InnoDB	10	Dynamic	1	16384	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
MembershipPrivilegeCl...	InnoDB	10	Dynamic	5	3276	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Memberships	InnoDB	10	Dynamic	20	819	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	21	2024-08-05 21:28:34	2024-08-05 21:28:45		utf8mb4_090...
NumberCard	InnoDB	10	Dynamic	78	215	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayAction	InnoDB	10	Dynamic	9	1620	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayerContainsItems	InnoDB	10	Dynamic	39	420	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayerInvolveMatches	InnoDB	10	Dynamic	2	8192	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayerLevel	InnoDB	10	Dynamic	11	1489	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayerParticipateEvents	InnoDB	10	Dynamic	30	546	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Players	InnoDB	10	Dynamic	20	819	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	23	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
PlayerUsernameAndEm...	InnoDB	10	Dynamic	20	819	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
ReverseCard	InnoDB	10	Dynamic	8	2048	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
SkipCard	InnoDB	10	Dynamic	8	2048	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
Stores	InnoDB	10	Dynamic	20	819	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	21	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
StoreSellItems	InnoDB	10	Dynamic	500	32	16.0 KiB	0.0 bytes	16.0 KiB	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
TurnBelongsToPlayerAn...	InnoDB	10	Dynamic	18	1260	16.0 KiB	0.0 bytes	32.0 KiB	0.0 bytes	14	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
TurnLastAction	InnoDB	10	Dynamic	2	8192	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
WildCard	InnoDB	10	Dynamic	4	4096	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...
WildDraw4Card	InnoDB	10	Dynamic	4	4096	16.0 KiB	0.0 bytes	0.0 bytes	0.0 bytes	0	2024-08-05 21:28:34	2024-08-05 21:28:34		utf8mb4_090...

1.

Captured with Xnip

Table	Column	Type	Default Value	Nullable	Character Set	Collation	Privileges	Extra	Comments
WildDraw4Card	◆ card_id	int	NO				select,insert,update,references		
WildDraw4Card	◆ deck_id	int	NO				select,insert,update,references		
WildCard	◆ card_id	int	NO				select,insert,update,references		
WildCard	◆ deck_id	int	NO				select,insert,update,references		
TurnLostAction	◆ turn_id	int	NO				select,insert,update,references		
TurnLostAction	◆ player_id	int	NO				select,insert,update,references		
TurnLostAction	◆ match_id	int	NO				select,insert,update,references		
TurnBelongsToPlayerA...	◆ turn_id	int	NO				select,insert,update,references		
TurnBelongsToPlayerA...	◆ player_id	int	NO				select,insert,update,references		
TurnBelongsToPlayerA...	◆ match_id	int	NO				select,insert,update,references		
TurnBelongsToPlayerA...	◆ time_stamp	timestamp	CURRENT_TIME...	YES			select,insert,update,references		
TurnBelongsToPlayerA...	◆ turn_order	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		DEFAULT_GE...
Stores	◆ store_id	int	NO				select,insert,update,references		
Stores	◆ player_id	int	NO				select,insert,update,references		
Stores	◆ num_of_items	int	0	YES			select,insert,update,references		
StoreSellItems	◆ store_id	int	NO				select,insert,update,references		
StoreSellItems	◆ item_id	int	NO				select,insert,update,references		
SkipCard	◆ card_id	int	NO				select,insert,update,references		
SkipCard	◆ deck_id	int	NO				select,insert,update,references		
SkipCard	◆ color	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
ReverseCard	◆ card_id	int	NO				select,insert,update,references		
ReverseCard	◆ deck_id	int	NO				select,insert,update,references		
ReverseCard	◆ color	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Players	◆ win_rate	float	0	YES			select,insert,update,references		
Players	◆ player_id	int	NO				select,insert,update,references		
Players	◆ total_win	int	0	YES			select,insert,update,references		
Players	◆ total_game_count	int	0	YES			select,insert,update,references		
Players	◆ experience_point	int	0	YES			select,insert,update,references		
Players	◆ username	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Players	◆ country	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Players	◆ password	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
PlayUsernameAndE...	◆ username	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
PlayUsernameAndE...	◆ email	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
PlayParticipateEvents	◆ player_id	int	NO				select,insert,update,references		
PlayParticipateEvents	◆ event_id	int	NO				select,insert,update,references		
PlayerLevel	◆ level	int	NO				select,insert,update,references		
PlayerInvolveMatches	◆ player_id	int	NO				select,insert,update,references		
PlayerInvolveMatches	◆ match_id	int	NO				select,insert,update,references		
PlayContainItems	◆ player_id	int	NO				select,insert,update,references		
PlayContainItems	◆ item_id	int	NO				select,insert,update,references		
PlayAction	◆ turn_id	int	NO				select,insert,update,references		
PlayAction	◆ player_id	int	NO				select,insert,update,references		
PlayAction	◆ match_id	int	NO				select,insert,update,references		
PlayAction	◆ card_id	int	NO				select,insert,update,references		
PlayAction	◆ deck_id	int	NO				select,insert,update,references		
PlayAction	◆ hand_id	int	NO				select,insert,update,references		
NumberCard	◆ card_id	int	NO				select,insert,update,references		
NumberCard	◆ deck_id	int	NO				select,insert,update,references		
NumberCard	◆ number	int	NO				select,insert,update,references		
NumberCard	◆ color	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Memberships	◆ issue_date	date		NO			select,insert,update,references		
Memberships	◆ expire_date	date		NO			select,insert,update,references		
Memberships	◆ membership_id	int	NO				select,insert,update,references		
Memberships	◆ player_id	int	NO				select,insert,update,references		
Memberships	◆ privilege_level	int	NO				select,insert,update,references		
Memberships	◆ status	varchar(255)	YES	utf8mb4	utf8mb4_090...	select,insert,update,references			
MembershipPrivilege...	◆ privilege_level	int	NO				select,insert,update,references		
MembershipPrivilege...	◆ privilege_class	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Matches	◆ match_id	int	NO				select,insert,update,references		
Matches	◆ start_time	timestamp	CURRENT_TIME...	YES			select,insert,update,references		
Matches	◆ end_time	timestamp		YES			select,insert,update,references		
Matches	◆ winner	varchar(255)	YES	utf8mb4	utf8mb4_090...	select,insert,update,references			
Matches	◆ status	varchar(255)	In Process	YES	utf8mb4	utf8mb4_090...	select,insert,update,references		
MatchHasDeck	◆ match_id	int	NO				select,insert,update,references		
MatchHasDeck	◆ deck_id	int	NO				select,insert,update,references		
Items	◆ item_id	int	NO				select,insert,update,references		
Items	◆ current_price	int	NO				select,insert,update,references		
Items	◆ name	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Items	◆ quality	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Items	◆ applied_promotion	varchar(255)	YES	utf8mb4	utf8mb4_090...	select,insert,update,references			
ItemOriginalPrice	◆ original_price	int		NO			select,insert,update,references		
ItemOriginalPrice	◆ quality	varchar(255)		NO			select,insert,update,references		
ItemDiscount	◆ discount	int		NO			select,insert,update,references		
ItemDiscount	◆ applied_promotion	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
HandBelongsToPlayer...	◆ hand_id	int	NO				select,insert,update,references		
HandBelongsToPlayer...	◆ player_id	int	NO				select,insert,update,references		
HandBelongsToPlayer...	◆ match_id	int	NO				select,insert,update,references		
HandBelongsToPlayer...	◆ card_amount	int	7	YES			select,insert,update,references		
Events	◆ start_date	date		NO			select,insert,update,references		
Events	◆ end_date	date		NO			select,insert,update,references		
Events	◆ event_id	int	NO				select,insert,update,references		
Events	◆ num_of_participants	int	0	YES			select,insert,update,references		
Events	◆ name	varchar(255)	YES	utf8mb4	utf8mb4_090...	select,insert,update,references			
Events	◆ status	varchar(255)	NO	utf8mb4	utf8mb4_090...	select,insert,update,references			
DrawAction	◆ turn_id	int	NO				select,insert,update,references		
DrawAction	◆ player_id	int	NO				select,insert,update,references		
DrawAction	◆ match_id	int	NO				select,insert,update,references		
DrawAction	◆ draw_amount	int	NO				select,insert,update,references		
Draw2Card	◆ card_id	int	NO				select,insert,update,references		
Draw2Card	◆ deck_id	int	NO				select,insert,update,references		
Decks	◆ color	varchar(255)		NO	utf8mb4	utf8mb4_090...	select,insert,update,references		
Decks	◆ deck_id	int	NO				select,insert,update,references		
Decks	◆ card_amount	int	108	YES			select,insert,update,references		
CardsDrawnInTurn	◆ turn_id	int	NO				select,insert,update,references		
CardsDrawnInTurn	◆ player_id	int	NO				select,insert,update,references		
CardsDrawnInTurn	◆ match_id	int	NO				select,insert,update,references		
CardsDrawnInTurn	◆ card_id	int	NO				select,insert,update,references		
CardsDrawnInTurn	◆ deck_id	int	NO				select,insert,update,references		
CardHeldByHand	◆ card_id	int	NO				select,insert,update,references		
CardHeldByHand	◆ deck_id	int	NO				select,insert,update,references		
CardHeldByHand	◆ hand_id	int	NO				select,insert,update,references		
CardHeldByHand	◆ player_id	int	NO				select,insert,update,references		
CardHeldByHand	◆ match_id	int	NO				select,insert,update,references		
CardBelongsToDeck	◆ card_id	int	NO				select,insert,update,references		
CardBelongsToDeck	◆ deck_id	int	NO				select,insert,update,references		
CardBelongsToDeck	◆ is_card_in_deck	int	1	YES			select,insert,update,references		
CardBelongsToDeck	◆ name	varchar(255)	NO	utf8mb4	utf8mb4_090...	select,insert,update,references			

Please ignore the average row length and the row length as they are inaccurate. Instead in the repository, inside insertion\_images, find the associated tables and their population after the SQL script provided is run. Please do pardon the lack of editing but the tables are present, You will also find the primary keys and the foreign keys listed, in the bottom left.

Also please refer to previous and the updated ER diagrams which you can find in the repository as well.

You will find information about this in the README.txt file, as well.

## List of SQL Queries

```
1. /db.js
-- /config/db.js Line 17
CREATE DATABASE ${process.env.DATABASE}

-- /config/db.js Line 21
USE ${process.env.DATABASE}

1. /models/dashboard.js

-- /models/dashboard.js Line 8
SELECT COUNT(*) AS activePlayers
FROM Players

-- /models/dashboard.js Line 22
SELECT COUNT(*) AS activeEvents
FROM Events
WHERE status = "Active"

-- /models/dashboard.js Line 37
SELECT COUNT(*) AS activeMatches
FROM Matches
WHERE status = "In Process"

-- /models/dashboard.js Line 52
SELECT SUM(iop.original_price) AS revenue
FROM PlayerContainItems pi
JOIN Items i ON pi.item_id = i.item_id
JOIN ItemOriginalPrice iop ON i.quality = iop.quality;

-- /models/dashboard.js Line 93
SELECT
    player_id AS playerID,
    username AS username,
    total_win AS totalWin,
    total_game_count AS totalGameCount,
    win_rate AS winRate,
    experience_point AS experiencePoint,
    country AS country
FROM Players
ORDER BY player_id DESC;

-- /models/dashboard.js Line 115
SELECT
    p.player_id AS playerID,
    p.username AS username,
    p.country AS country,
    pue.email AS email
```

```
FROM Players p
JOIN PlayerUsernameAndEmail pue ON p.username = pue.username
WHERE p.player_id = ?;

-- /models/dashboard.js line 136
SELECT * FROM PlayerUsernameAndEmail WHERE username = ?;

-- /models/dashboard.js line 147
SELECT * FROM PlayerUsernameAndEmail WHERE email = ?;

-- /models/dashboard.js line 158
UPDATE PlayerUsernameAndEmail
SET username = ?, email = ?
WHERE username = ?;

-- /models/dashboard.js line 179
UPDATE Players SET username = ?, password = ?, country = ? WHERE player_id = ?
;

-- /models/dashboard.js line 197
INSERT INTO Players SET username = ?, password = ?, country = ?;

-- /models/dashboard.js line 211
INSERT INTO PlayerUsernameAndEmail SET username = ?, email = ?;

-- /models/dashboard.js line 221
DELETE FROM PlayerUsernameAndEmail WHERE username = ?;

-- /models/dashboard.js line 231
SELECT player_id FROM Players WHERE username = ?;

1. /models/events.js
-- /models/events.js line 49
SELECT
    event_id AS eventID,
    name AS eventName,
    start_date AS eventStartDate,
    end_date AS eventEndDate,
    num_of_participants AS numOfParticipants,
    status AS eventStatus
FROM Events
ORDER BY event_id DESC;

-- /models/events.js line 96
INSERT INTO Events SET name = ?, start_date = ?, end_date = ?,
num_of_participants = ?, status = ?;

-- /models/events.js line 142
UPDATE Events SET name = ?, start_date = ?, end_date = ?, num_of_participants
```

```

= ?, status = ? WHERE event_id = ?;

-- /models/events.js Line 173
SELECT *
FROM Events
WHERE event_id = ?;

-- /models/events.js Line 197
DELETE FROM Events WHERE event_id = ?;

-- /models/events.js Line 242
SELECT * FROM Events WHERE name = ?;

1. /models/matches.js
-- /models/matches.js Line 11
SELECT
    match_id AS matchID,
    start_time AS matchStartTime,
    end_time AS matchEndTime,
    winner AS matchWinner,
    status AS matchStatus
FROM Matches
ORDER BY match_id DESC;

-- /models/matches.js Line 36
INSERT INTO Matches (end_time, winner) VALUES (NULL, NULL);

-- /models/matches.js Line 41
INSERT INTO PlayerInvolveMatches SET match_id = ?, player_id = ?;

-- /models/matches.js Line 55
SELECT
    start_time AS matchStartTime,
    end_time AS matchEndTime,
    winner AS matchWinner
FROM Matches
WHERE match_id = ?;

-- /models/matches.js Line 79
SELECT
    p.username AS username,
    p.country AS country
FROM Players p
JOIN PlayerInvolveMatches pim ON p.player_id = pim.player_id
WHERE pim.match_id = ?;

-- /models/matches.js Line 156
SELECT
    t.turn_id AS turnID,

```

```

t.time_stamp AS timestamp,
t.player_id AS playerID,
p.username AS username,
t.turn_order AS currentDirection
FROM TurnBelongsToPlayerAndMatch t
JOIN Players p ON t.player_id = p.player_id
WHERE t.match_id = ?
ORDER BY t.turn_id;

-- /models/matches.js line 180
SELECT
    pa.turn_id AS turnID,
    'Play' AS action,
    cbd.name AS additionalInfo
FROM PlayAction pa
JOIN CardBelongsToDeck cbd ON pa.card_id = cbd.card_id AND pa.deck_id =
cbd.deck_id
WHERE pa.match_id = ?;

-- /models/matches.js line 201
SELECT
    da.turn_id AS turnID,
    'Draw' AS action,
    da.draw_amount AS additionalInfo
FROM DrawAction da
WHERE da.match_id = ?;

-- /models/matches.js line 221
SELECT
    tla.turn_id AS turnID,
    'Turn Lost' AS action
FROM TurnLostAction tla
WHERE tla.match_id = ?;

-- /models/matches.js line 241
SELECT
    h.player_id AS playerID,
    h.card_amount AS cardInHand,
    d.card_amount AS cardInDeck
FROM HandBelongsToPlayerAndMatch h
JOIN MatchHasDeck md ON h.match_id = md.match_id
JOIN Decks d ON md.deck_id = d.deck_id
WHERE h.match_id = ?;

-- /models/matches.js line 262
SELECT
    p.username AS username
FROM Players p

```

```

JOIN PlayerInvolveMatches pim ON p.player_id = pim.player_id
WHERE pim.match_id = ?;

1. /models/memberships.js
-- /models/memberships.js Line 33
SELECT
    p.username AS username,
    p.player_id AS playerID,
    m.issue_date AS membershipIssueDate,
    m.expire_date AS membershipExpireDate,
    mpc.privilege_class AS membershipPrivilegeClass,
    m.privilege_level AS membershipPrivilegeLevel,
    m.status AS membershipStatus,
    CASE
        WHEN m.status = 'active' THEN DATEDIFF(m.expire_date, m.issue_date)
        ELSE 0
    END AS membershipDaysRemaining
FROM Memberships m
JOIN Players p ON m.player_id = p.player_id
JOIN MembershipPrivilegeClass mpc ON m.privilege_level =
mpc.privilege_level
ORDER BY ${orderByClause};

-- /models/memberships.js Line 70
SELECT
    mpc.privilege_class AS privilegeClass
FROM MembershipPrivilegeClass mpc
WHERE privilege_level = ?

-- /models/memberships.js Line 87
SELECT
    p.player_id AS playerID,
    p.username AS username,
    m.issue_date AS membershipIssueDate,
    m.expire_date AS membershipExpireDate,
    mpc.privilege_class AS membershipPrivilegeClass,
    m.privilege_level AS membershipPrivilegeLevel,
    m.status AS membershipStatus
FROM Memberships m
JOIN Players p ON m.player_id = p.player_id
JOIN MembershipPrivilegeClass mpc ON m.privilege_level = mpc.privilege_level
WHERE m.player_id = ?;

-- /models/memberships.js Line 115
SELECT membership_id FROM Memberships WHERE player_id = ?

-- /models/memberships.js Line 149
UPDATE Memberships SET ${setClause} WHERE player_id = ?

```

```

-- /models/memberships.js Line 166
INSERT INTO Memberships SET ?

-- /models/memberships.js Line 183
DELETE FROM Memberships WHERE player_id = ?

-- /models/memberships.js Line 194
SELECT * FROM Memberships

-- /models/memberships.js Line 201
UPDATE Memberships SET status = ? WHERE player_id = ?

1. /models/search-results.js
-- /models/search-results.js line 6
SELECT
    e.name AS event_name,
    COUNT(ppe.player_id) AS participants
FROM Events e
JOIN PlayerParticipateEvents ppe ON e.event_id = ppe.event_id
GROUP BY e.name
HAVING COUNT(ppe.player_id) > ${number};

-- /models/search-results.js line 15
SELECT country, event_name, COUNT(player_id) AS participants
FROM (
    SELECT p.country, e.name AS event_name, ppe.player_id
    FROM Players p
    JOIN PlayerParticipateEvents ppe ON p.player_id = ppe.player_id
    JOIN Events e ON ppe.event_id = e.event_id
) AS country_event_participation
GROUP BY country, event_name;

-- /models/search-results.js line 25
SELECT p.username
FROM Players p
WHERE NOT EXISTS (
    SELECT e.event_id
    FROM Events e
    WHERE e.status = 'Completed' AND NOT EXISTS (
        SELECT pe.player_id
        FROM PlayerParticipateEvents pe
        WHERE pe.event_id = e.event_id AND pe.player_id = p.player_id
    )
);
;

1. /models/store-items.js
-- /models/store-items.js line 8
SELECT
    s.store_id AS storeID,

```

```

s.num_of_items AS numOfItems,
p.username AS username,
p.player_id AS playerID
FROM Stores s
JOIN Players p ON s.player_id = p.player_id
ORDER BY s.player_id DESC;

-- /models/store-items.js Line 48
SELECT
    i.item_id AS itemID,
    i.name AS itemName,
    i.quality AS itemQuality,
    i.current_price AS itemCurrentPrice,
    iop.original_price AS itemOriginalPrice,
    i.applied_promotion AS itemAppliedPromotion,
    id.discount AS itemDiscount
FROM Items i
JOIN ItemOriginalPrice iop ON i.quality = iop.quality
JOIN ItemDiscount id ON i.applied_promotion = id.applied_promotion
ORDER BY i.item_id DESC;

-- /models/store-items.js Line 78
SELECT
    i.item_id AS itemID,
    i.name AS itemName,
    i.quality AS itemQuality,
    i.current_price AS itemCurrentPrice,
    i.applied_promotion AS itemAppliedPromotion,
    iop.original_price AS itemOriginalPrice,
    id.discount AS itemDiscount
FROM Items i
JOIN ItemOriginalPrice iop ON i.quality = iop.quality
JOIN ItemDiscount id ON i.applied_promotion = id.applied_promotion
JOIN StoreSellItems ssi ON i.item_id = ssi.item_id
WHERE ssi.store_id = ?
ORDER BY i.item_id;

-- /models/store-items.js Line 107
SELECT
    id.discount AS itemDiscount
FROM ItemDiscount id
WHERE applied_promotion = ?;

-- /models/store-items.js Line 125
SELECT
    iop.original_price AS itemOriginalPrice
FROM ItemOriginalPrice iop
WHERE quality = ?;

```

```
-- /models/store-items.js Line 142
SELECT store_id FROM Stores WHERE player_id = ?;

-- /models/store-items.js Line 154
SELECT
    i.item_id AS itemID,
    i.name AS itemName,
    i.quality AS itemQuality,
    i.applied_promotion AS itemAppliedPromotion
FROM Items i
WHERE item_id = ?;

-- /models/store-items.js Line 174
SELECT * FROM Items WHERE name = ?;

-- /models/store-items.js Line 186
SELECT *
FROM StoreSellItems
WHERE store_id = (SELECT store_id FROM Stores WHERE player_id = ?) AND
item_id = ?;

-- /models/store-items.js Line 200
INSERT INTO StoreSellItems SET store_id = ?, item_id = ?;

-- /models/store-items.js Line 222
UPDATE Items SET name = ?, description = ?, price = ?, category = ?,
stock_quantity = ? WHERE item_id = ?;

-- /models/store-items.js Line 236
INSERT INTO Stores SET player_id = ?;

-- /models/store-items.js Line 248
INSERT INTO Items SET name = ?, quality = ?, applied_promotion = ?,
current_price = ?;

-- /models/store-items.js Line 263
DELETE FROM Items WHERE item_id = ?;

-- /models/store-items.js Line 275
DELETE FROM StoreSellItems WHERE store_id = ? AND item_id = ?;

-- /models/store-items.js Line 287
SET SQL_SAFE_UPDATES = 0;

-- /models/store-items.js Line 290
UPDATE Stores
SET num_of_items = (
    SELECT COUNT(*)
    FROM StoreSellItems
```

```
WHERE StoreSellItems.store_id = Stores.store_id
);
```

```
-- /models/store-items.js Line 298
SET SQL_SAFE_UPDATES = 1;
```

## Demo with Screenshots

### 1. INSERT

#### 1. Before

The screenshot shows the Uno Game System Admin dashboard. On the left is a blue sidebar with navigation links: Dashboard, Store Items, Memberships, Events, Matches, and Logout. The main area has a search bar at the top. Below it is a 'DASHBOARD' section with four cards: Active Players (20), Active Events (5), Active Matches (0), and Revenue (\$25,932.00). The bottom section is titled 'Recent Players' with a table:

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Dangerous Salesman	20	27	0.74	10000	Japan	<input type="checkbox"/> <input type="checkbox"/>
Selfish Engineer	12	13	0.92	9000	USA	<input type="checkbox"/> <input type="checkbox"/>
Poor Student	8	10	0.8	8000	China	<input type="checkbox"/> <input type="checkbox"/>
Happy Professor	15	25	0.6	5000	India	<input type="checkbox"/> <input type="checkbox"/>
Handsome Programmer	10	20	0.5	3000	Canada	<input type="checkbox"/> <input type="checkbox"/>

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1.

#### 2. During

The screenshot shows the same dashboard as above, but with a modal window open over it. The modal is titled 'Create New Player' and contains fields for Username (Test Name), Password (\*\*\*\*\*), Confirm Password (\*\*\*\*\*), Email (test@testmail.ca), and Country (Canada). At the bottom are 'Register' and 'Cancel' buttons. The background dashboard elements are dimmed.

1.

#### 3. After

**DASHBOARD**

Active Players	Active Events	Active Matches	Revenue
21	5	0	\$25,932.00

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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## 1. Before

### 1. Before

**RECENT MEMBERSHIPS**

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Brilliant Analyst	2024-07-21	135	Diamond	5	Active	
Skilled Mechanic	2024-07-17	0	Gold	3	Expired	
Organized Librarian	2024-07-15	365	Diamond	5	Active	
Efficient Assistant	2024-06-14	251	Platinum	4	Active	
Expert Technician	2024-06-08	0	Gold	3	Expired	
Ambitious Entrepreneur	2024-05-30	270	Bronze	1	Active	
Poor Student	2024-05-26	0	Silver	2	Expired	
Insightful Consultant	2024-05-19	0	Silver	2	Expired	
Dangerous Salesman	2024-04-15	0	Diamond	5	Expired	
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	

Sort By: Recent Create Membership

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## 2. DELETE

### 1. Before

### 1. Before

### 2. During

UNO GAME SYSTEM

ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

RECENT MEMBERSHIPS

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Brilliant Analyst	2024-07-21	135	Diamond	5	Active	 
Skilled Mechanic	2024-07-17	0	Gold	3	Expired	 
Organized Librarian	2024-07-15	365		5	Active	 
Efficient Assistant	2024-06-14	251		4	Active	 
Expert Technician	2024-06-08	0		3	Expired	 
Ambitious Entrepreneur	2024-05-30	270		1	Active	 
Poor Student	2024-05-26	0		2	Expired	 
Insightful Consultant	2024-05-19	0		2	Expired	 
Dangerous Salesman	2024-04-15	0		5	Expired	 
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	 

Sort By: Recent

Create Membership

Are you sure?

This action cannot be undone. All values associated with this field will be lost.

**Delete Membership**

**Cancel**

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### 1. 3. After

UNO GAME SYSTEM

ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

Search Anything...

Sort By: Recent

Create Membership

RECENT MEMBERSHIPS

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Skilled Mechanic	2024-07-17	0	Gold	3	Expired	
Organized Librarian	2024-07-15	365	Diamond	5	Active	
Efficient Assistant	2024-06-14	251	Platinum	4	Active	
Expert Technician	2024-06-08	0	Gold	3	Expired	
Ambitious Entrepreneur	2024-05-30	270	Bronze	1	Active	
Poor Student	2024-05-26	0	Silver	2	Expired	
Insightful Consultant	2024-05-19	0	Silver	2	Expired	
Dangerous Salesman	2024-04-15	0	Diamond	5	Expired	
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	
Curious Researcher	2024-04-01	233	Diamond	5	Active	

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### 3. UPDATE

**UNO GAME SYSTEM ADMIN**

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

RECENT MEMBERSHIPS

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Skilled Mechanic	2024-07-17	0	Gold	3	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Organized Librarian	2024-07-15	365	Diamond	5	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Efficient Assistant	2024-06-14	251	Platinum	4	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Expert Technician	2024-06-08	0	Gold	3	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Ambitious Entrepreneur	2024-05-30	270	Bronze	1	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Poor Student	2024-05-26	0	Silver	2	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Insightful Consultant	2024-05-19	0	Silver	2	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Dangerous Salesman	2024-04-15	0	Diamond	5	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Curious Researcher	2024-04-01	233	Diamond	5	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>

Sort By: Recent

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- 1.
2. During

**UNO GAME SYSTEM ADMIN**

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

RECENT MEMBERSHIPS

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Skilled Mechanic	2024-07-17	0	Gold	3	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Organized Librarian	2024-07-15	365	Diamond	5	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Efficient Assistant	2024-06-14	251	Platinum	4	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Expert Technician	2024-06-08	0	Gold	3	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Ambitious Entrepreneur	2024-05-30	270	Bronze	1	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Poor Student	2024-05-26	0	Silver	2	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Insightful Consultant	2024-05-19	0	Silver	2	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Dangerous Salesman	2024-04-15	0	Diamond	5	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>
Curious Researcher	2024-04-01	233	Diamond	5	Active	<input checked="" type="checkbox"/> <input type="button" value="Edit"/>

Sort By: Recent

**Edit Membership**

Username: Skilled Mechanic

Issue Date: 2024-07-17

Expire Date: 2099-09-09

Privilege Level: 5 Diamond

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- 1.
3. After

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

RECENT MEMBERSHIPS

Username	Issue Date	Days Remaining	Privilege Class	Privilege Level	Status	Actions
Skilled Mechanic	2024-06-05	27428	Diamond	5	Active	
Organized Librarian	2024-07-15	365	Diamond	5	Active	
Efficient Assistant	2024-06-14	251	Platinum	4	Active	
Expert Technician	2024-06-08	0	Gold	3	Expired	
Ambitious Entrepreneur	2024-05-30	270	Bronze	1	Active	
Poor Student	2024-05-26	0	Silver	2	Expired	
Insightful Consultant	2024-05-19	0	Silver	2	Expired	
Dangerous Salesman	2024-04-15	0	Diamond	5	Expired	
Passionate Teacher	2024-04-10	0	Platinum	4	Expired	
Curious Researcher	2024-04-01	233	Diamond	5	Active	

Sort By: Recent Create Membership

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## 1. Selection

### 1. Before

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

RECENT STORES

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	
19	25	Selfish Engineer	
18	25	Poor Student	

RECENT ITEMS

Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
Mystery Decoration Box	Legendary	\$1268	\$1688	Cyber Monday	25% OFF	
Mystery Effects Box	Legendary	\$1268	\$1688	Cyber Monday	25% OFF	
Name Change Card	Common	\$188	\$188	No Promotion	No Discount	
Decoration Fragment	Common	\$188	\$188	No Promotion	No Discount	

Sort By: Recent Create Item

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### 1.

### 2. During

**UNO GAME SYSTEM ADMIN**

Search Anything...

**RECENT STORES**

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	<a href="#">View Available Store Items</a>
19	25	Selfish Engineer	<a href="#">View Available Store Items</a>
18	25	Poor Student	<a href="#">View Available Store Items</a>

**RECENT ITEMS**

Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
Mystery Decoration Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Mystery Effects Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Name Change Card	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Decoration Fragment	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>

Sort By: Recent [Recent](#) [Created](#) [Create Item](#)

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1.

### 3. After

**UNO GAME SYSTEM ADMIN**

Search Anything...

**RECENT STORES**

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	<a href="#">View Available Store Items</a>
19	25	Selfish Engineer	<a href="#">View Available Store Items</a>
18	25	Poor Student	<a href="#">View Available Store Items</a>

**Available Items in Store 20**

Item ID	Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
1	Watch and Learn! Emote	Epic	\$488	\$888	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
2	Seriously?! Emote	Epic	\$488	\$888	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
3	Take This! Emote	Epic	\$488	\$888	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
4	No Pressure Emote	Uncommon	\$288	\$288	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
5	XOXO Emote	Uncommon	\$288	\$288	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
6	Sorry Emote	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
7	Crying Emote	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
8	Doubt Emote	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
9	Sign Emote	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
10	Heart Emote	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>

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1.

### 5. Projection

#### 1. Before

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Search Anything...

### RECENT STORES

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	<a href="#">View Available Store Items</a>
19	25	Selfish Engineer	<a href="#">View Available Store Items</a>
18	25	Poor Student	<a href="#">View Available Store Items</a>

### RECENT ITEMS

Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
Mystery Decoration Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Mystery Effects Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Name Change Card	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Decoration Fragment	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>

Sort By:     Create Item

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1.  
2. During

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Search Anything...

### RECENT STORES

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	<a href="#">View Available Store Items</a>
19	25	Selfish Engineer	<a href="#">View Available Store Items</a>
18	25	Poor Student	<a href="#">View Available Store Items</a>

### RECENT ITEMS

Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
Mystery Decoration Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Mystery Effects Box	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Name Change Card	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Decoration Fragment	Common	\$188	\$188	No Promotion	No Discount	<a href="#"></a> <a href="#"></a> <a href="#"></a>

Sort By:  Recent  Quality  Current Price  Discount

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1.  
3. After

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Search Anything...

### RECENT STORES

Store ID	Number of Items	Linked To	Actions
20	25	Dangerous Salesman	<a href="#">View Available Store Items</a>
19	25	Selfish Engineer	<a href="#">View Available Store Items</a>
18	25	Poor Student	<a href="#">View Available Store Items</a>

### RECENT ITEMS

Name	Quality	Current Price	Original Price	Applied Promotion	Discount	Actions
Couple of Gems	Common	\$141	\$188	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
It's Show Time Avatar Frame	Epic	\$666	\$888	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Wagon of Gems	Epic	\$666	\$888	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>
Champion Avatar Frame	Legendary	\$1266	\$1688	Cyber Monday	25% OFF	<a href="#"></a> <a href="#"></a> <a href="#"></a>

Sort By:  [Create Item](#)

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1.

## 6. Join

### 1. Before

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Search Anything...

### RECENT MATCHES

Match ID	Start Time	End Time	Winner	Status	Actions
1	2024-08-05 22:49:02 PDT	2024-07-27 12:30:00 PDT	Reliable Developer	Completed	<a href="#">View Details</a>

[Create Match](#)

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1.

### 2. During

1.

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

RECENT MATCHES

Match ID	Start Time	End Time	Winner	Status	Actions
1	2024-08-05 22:49:02 PDT	2024-07-27 12:30:00 PDT	Reliable Developer	Completed	<a href="#">View Details</a>

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### 3. After

1.

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

UNO Match History Log

Match ID: 1  
 Start Time: 2024-08-05 22:49:02 PDT  
 End Time: 2024-07-27 12:30:00 PDT  
 Winner: Reliable Developer

Players

- Reliable Developer (CANADA)
- Brilliant Analyst (INDIA)

Match Actions

Timestamp	Player	Action	Additional Info	Cards in Hand	Cards in Deck	Current Direction	Next Turn
2024-08-05 22:49:02 PDT	System	Game Start		Full	94	Clockwise	Reliable Developer
2024-08-05 10:49:00 PDT	Reliable Developer	Play	Red Skip	6	94	Clockwise	Reliable Developer
2024-08-05 10:50:00 PDT	Brilliant Analyst	Turn Lost		7	94	Clockwise	Brilliant Analyst
2024-08-05 10:51:00 PDT	Reliable Developer	Play	Red 3	5	94	Clockwise	Reliable Developer
2024-08-05 10:52:00 PDT	Brilliant Analyst	Play	Red 9	6	94	Clockwise	Brilliant Analyst
2024-08-05 10:53:00 PDT	Reliable Developer	Play	Red Draw 2	4	94	Clockwise	Reliable Developer

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## 7. Aggregation with Group By

### 1. Before

1.

UNO GAME SYSTEM  
ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

Search Anything...

DASHBOARD

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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2. During

1.

UNO GAME SYSTEM  
ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

Search Anything...

How many participants from each country are there in each event?

DASHBOARD

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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3. After

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Q: How many participants from each country are there in each event?

DASHBOARD

Active Players	21
Active Events	5
Active Matches	0
Revenue	\$25,932.00

Your Search Result

COUNTRY	EVENT NAME	PARTICIPANTS
Canada	UNO Mania	3
Canada	Reverse Madness	1
Canada	Wild Card Weekend	1
Canada	Grand Tournament	1
Canada	Weekly Challenge	1
Canada	Holiday Special	1
Canada	Ultimate Showdown	1
India	UNO Mania	3
India	Reverse Madness	1
India	Wild Card Weekend	1

Sort By: Recent Add Player

Country Actions

Recent Points

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1.

## 8. Aggregation with Having

### 1. Before

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Q: Search Anything...

DASHBOARD

Active Players	21
Active Events	5
Active Matches	0
Revenue	\$25,932.00

Recent Players

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions	
Test Name	0	0	0	0	Canada		
Dangerous Salesman	20	27	0.74	10000	Japan		
Selfish Engineer	12	13	0.92	9000	USA		
Poor Student	8	10	0.8	8000	China		
Happy Professor	15	25	0.6	5000	India		

Sort By: Recent Add Player

Country Actions

Recent Points

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1.

### 2. During

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Q. which  
**Which events have more than 10 participants?**  
**Which players have participated in all the events?**

DASHBOARD

**Active Players**  
**21**

**Active Events**  
**5**

**Active Matches**  
**0**

**Revenue**  
**\$25,932.00**

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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### 1. 3. After

UNO GAME SYSTEM  
ADMIN

- Dashboard
- Store Items
- Memberships
- Events
- Matches
- Logout

Q. Which events have more than 10 participants?

DASHBOARD

**Active Players**  
**21**

**Active Events**  
**5**

**Active Matches**  
**0**

**Revenue**  
**\$25,932.00**

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

**Your Search Result**

EVENT NAME	PARTICIPANTS
UNO Maria	12

Sort By: Recent Add Player

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### 1. 9. Nested Aggregation with Group By 1. Before

UNO GAME SYSTEM  
ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

Search Anything...

DASHBOARD

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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- 1.
2. During

UNO GAME SYSTEM  
ADMIN

Dashboard

Store Items

Memberships

Events

Matches

Logout

Search Anything...

DASHBOARD

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

Sort By: Recent Add Player

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- 1.
3. After

The screenshot shows the Uno Game System Admin interface. On the left, a blue sidebar menu lists: Dashboard, Store Items, Memberships, Events, Matches, and Logout. The main area is the Dashboard, which includes a search bar at the top asking "Which players have participated in all the events?". Below the search bar are four cards: Active Players (21), Active Events (5), Active Matches (0), and Revenue (\$25,932.00). A modal window titled "Your Search Result" is open, showing a table with one row for "Reliable Developer". The table has columns: USERNAME, Total Wins, Experience Points, Country, and Actions. The "Actions" column contains edit and delete icons. Below the modal is a table titled "Recent Players" with columns: Username, Total Wins, Total Game Count, Win Rate, Experience Points, Country, and Actions. The table data is as follows:

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
Test Name	0	0	0	0	Canada	
Dangerous Salesman	20	27	0.74	10000	Japan	
Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

At the bottom right of the dashboard, it says "Developed and Designed By YC Graphics | © 2024 All rights Reserved."

1.

## 10. Division

### 1. Before

The screenshot shows the Uno Game System Admin interface. On the left, a blue sidebar menu lists: Dashboard, Store Items, Memberships, Events, Matches, and Logout. The main area is the Dashboard, which includes a search bar at the top asking "Search Anything...". Below the search bar are four cards: Active Players (21), Active Events (5), Active Matches (0), and Revenue (\$25,932.00). A modal window titled "Your Search Result" is open, showing a table with one row for "Reliable Developer". The table has columns: USERNAME, Total Wins, Experience Points, Country, and Actions. The "Actions" column contains edit and delete icons. Below the modal is a table titled "Recent Players" with columns: Username, Total Wins, Total Game Count, Win Rate, Experience Points, Country, and Actions. The table data is as follows:

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions
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Selfish Engineer	12	13	0.92	9000	USA	
Poor Student	8	10	0.8	8000	China	
Happy Professor	15	25	0.6	5000	India	

At the bottom right of the dashboard, it says "Developed and Designed By YC Graphics | © 2024 All rights Reserved."

1.

### 2. During

**UNO GAME SYSTEM  
ADMIN**

which player  
**Which players have participated in all the events?**

**DASHBOARD**

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions	
Test Name	0	0	0	0	Canada		
Dangerous Salesman	20	27	0.74	10000	Japan		
Selfish Engineer	12	13	0.92	9000	USA		
Poor Student	8	10	0.8	8000	China		
Happy Professor	15	25	0.6	5000	India		

Sort By: Recent Add Player

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1.  
3. After

**UNO GAME SYSTEM  
ADMIN**

Which players have participated in all the events?

**DASHBOARD**

Active Players <b>21</b>	Active Events <b>5</b>	Active Matches <b>0</b>	Revenue <b>\$25,932.00</b>
-----------------------------	---------------------------	----------------------------	-------------------------------

**Recent Players**

Username	Total Wins	Total Game Count	Win Rate	Experience Points	Country	Actions	
Test Name	0	0	0	0	Canada		
Dangerous Salesman	20	27	0.74	10000	Japan		
Selfish Engineer	12	13	0.92	9000	USA		
Poor Student	8	10	0.8	8000	China		
Happy Professor	15	25	0.6	5000	India		

**Your Search Result**

USERNAME
Reliable Developer

Sort By: Recent Add Player

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