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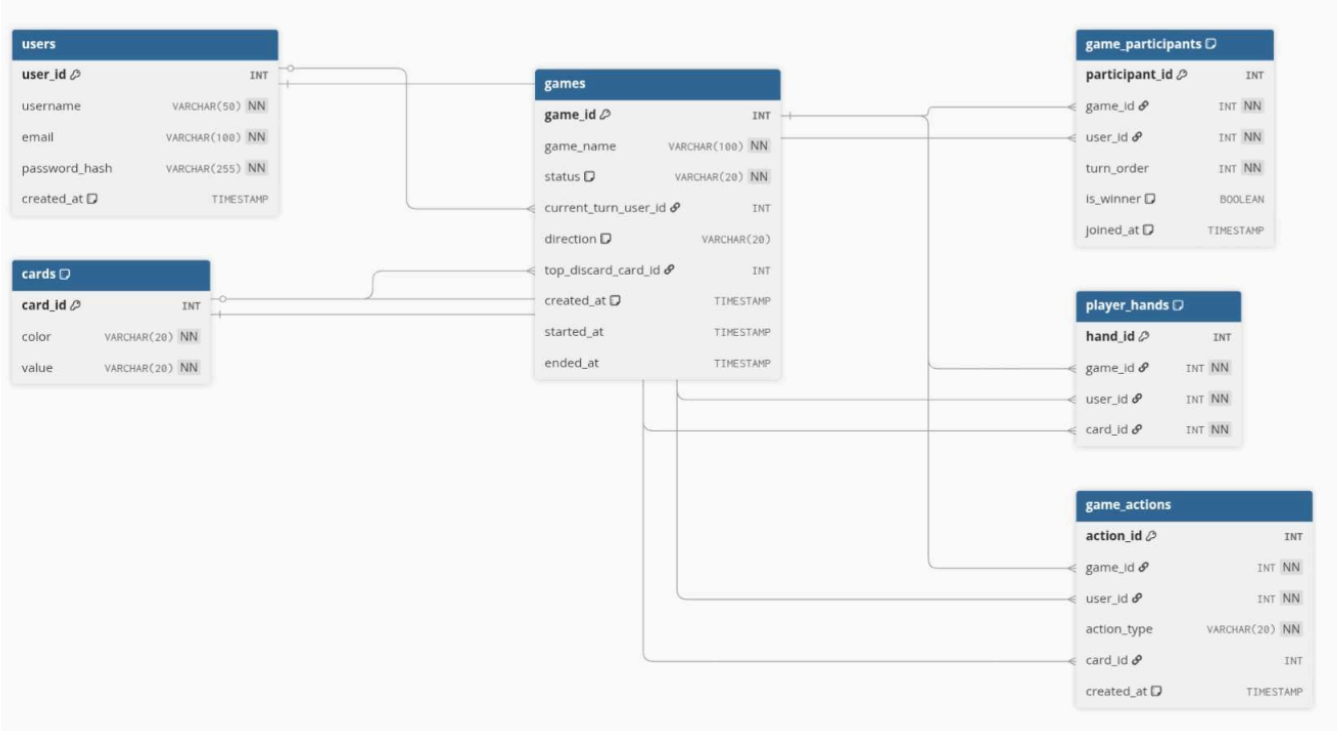
Milestone 2: DB Schema

```
// UNO Game Database Schema

Table users {
  user_id INT [pk, increment]
  username VARCHAR(50) [unique, not null]
  email VARCHAR(100) [unique, not null]
  password_hash VARCHAR(255) [not null]
  created_at TIMESTAMP [default: `now()`]
}

Table games {
  game_id INT [pk, increment]
  game_name VARCHAR(100) [not null]
  status VARCHAR(20) [not null, default: 'waiting'] // 'waiting',
'in_progress', 'completed'
  current_turn_user_id INT
  direction VARCHAR(20) [default: 'clockwise'] // 'clockwise',
'counterclockwise'
  top_discard_card_id INT
  created_at TIMESTAMP [default: `now()`]
  started_at TIMESTAMP
  ended_at TIMESTAMP
}

Table game_participants {
  participant_id INT [pk, increment]
  game_id INT [not null]
  user_id INT [not null]
  turn_order INT [not null]

  is_winner BOOLEAN [default: false]
  joined_at TIMESTAMP [default: `now()`]

  indexes {
    (game_id, user_id) [unique]
  }
}
```

```
Table cards {
  card_id INT [pk, increment]
  color VARCHAR(20) [not null] // 'red', 'blue', 'green', 'yellow', 'wild'
  value VARCHAR(20) [not null] // '0'-'9', 'skip', 'reverse', 'draw_two',
'wild', 'wild_draw_four'

  indexes {
    (color, value) [unique]
  }
}

Table player_hands {
  hand_id INT [pk, increment]
  game_id INT [not null]
  user_id INT [not null]
  card_id INT [not null]

  indexes {
    (game_id, user_id)
  }
}


Table game_actions {
  action_id INT [pk, increment]
  game_id INT [not null]
  user_id INT [not null]
  action_type VARCHAR(20) [not null] // 'play', 'draw', 'uno'
  card_id INT
  created_at TIMESTAMP [default: `now()`]
}

// Relationships
Ref: games.current_turn_user_id > users.user_id
Ref: games.top_discard_card_id > cards.card_id

Ref: game_participants.game_id > games.game_id [delete: cascade]
Ref: game_participants.user_id > users.user_id

Ref: player_hands.game_id > games.game_id [delete: cascade]
Ref: player_hands.user_id > users.user_id
Ref: player_hands.card_id > cards.card_id
```

```
Ref: game_actions.game_id > games.game_id [delete: cascade]
Ref: game_actions.user_id > users.user_id
Ref: game_actions.card_id > cards.card_id
```

2. Relationships



3. Normalization and Design Rationale

We structured the database to separate game state (games table), player participation (game_participants), and card data (player_hands, game_actions) to support real-time multiplayer gameplay with accurate turn validation, synchronized state updates, and persistent user sessions, ensuring scalability and clarity in data management.