CSC 675 Milestone One:
Movie Ticket Booking System

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Project Description

For my database milestone project, I'm going to be designing a movie ticket booking system. This easy-to-use database system serves to provide a complete package for our clients who want to create a user-friendly movie ticket booking system, while also addressing specific movie ticket needs. I feel that companies like Fandango and Regal would greatly benefit from a database system like this.

In my database system, a user can explore movies that are showing depending on the date and time they are looking for. There, they can find more details about the movie such as ticket pricing, available seats, promotions, show times, and even reviews. Tickets can be sold online or in person ahead of time. This database also has a registration system where guests can sign up and create an account to be regular users to earn points and keep up to date on promotional content. User information and payment information are all encrypted and stored in the database.

For our clients, the database also contains roles for admins for control over the system. The database supports multiple access levels for security and provides an overview of ticket sales for better profit analysis.

Functional Database Requirements

The following details functional database requirements for the following entities: tickets, movies, seats, theater rooms, users, guests, admins, accounts, payment info, and roles.

1. Tickets
    1.1. Every ticket can only have one movie showing
    1.2. A ticket has a movie, movie time, price, seating, and theater room.
    1.3. Tickets cannot have the same seat at the same movie time.
    1.4. A ticket can be refunded if it is before the moving showing time.
    1.5. A ticket cannot be sold after the movie's showing time
    1.6. If a ticket's date is after a movie's showing time, it is considered expired
    1.7. A ticket can have multiple prices for the same movie
    1.8. A ticket's price can be reduced if there is a promotion or discount
    1.9. Multiple tickets can be bought together by more than one user (e.g. family of four)
    1.10. When a ticket is sold, it contributes to the movie theater's profits
    1.11. The number of tickets sold and unsold can be monitored by the admin

2. Movie
    2.1. Movies can have multiple showing times
    2.2. Movies can be shown in multiple theater rooms
    2.3. Movies can have multiple prices depending on the day
    2.4. Movies can either be "now showing" or "not showing"
    2.5. One Movie showing can have multiple tickets
    2.6. A Movie can be watched by many Users
    2.7. A Movie can have multiple resolution qualities showing at the same time (e.g. 3D, 4D, ultra-widescreen, etc...)
    2.8. A Movie can be dubbed in multiple languages
    2.9. A Movie can come with subtitles or no subtitles and those subtitles can be in different languages
    2.10. A Movie can have a special sound system (e.g. Dolby Sound System, THX, etc...)

3. Seat
    3.1. A seat has to belong to a theater room
    3.2. A seat can be taken or unoccupied
    3.3. Each seat is unique and cannot be duplicated.
    3.4. A seat can be occupied for a finite amount of time
    3.5. A seat cannot be taken by more than one person per movie showing
    3.6. A seat can have different properties that make it special (e.g. it has reclining seats, it is wider, it is more cushioned, etc...)

3.7. A seat can have a handicap variant

4. Theater Room
   4.1. A theater room is an aggregation of seats (A theater contains multiple seats)
   4.2. A theater room can have an ID
   4.3. Each theater room is unique
   4.4. A theater room can only show one movie at a time
   4.5. A theater room can have different room sizes (different amount of seats)

5. User
   5.1. A User can have many Tickets
   5.2. A User can take a seat
   5.3. A User can watch a Movie by buying a Ticket
   5.4. A User can have a role
   5.5. A User can have one role only, but it can be changed
   5.6. A User has to have an account linked with them
   5.7. A User can have discounts and promotions for them
   5.8. A User can have points and rewards for special discounts
   5.9. A User can leave a review and a comment about a movie

6. Guest
   6.1. A Guest is the same as a User but does not have any personal information saved on the database.

7. Admin
   7.1. An admin has the highest privilege among all Users
   7.2. An admin can change the roles of other Users
   7.3. An admin can view the total revenue and costs of the movie booking system
   7.4. An admin has complete control over the database
   7.5. Admins can manually refund tickets
   7.6. Admins can cancel movies and payments
   7.7. Admins can assign a new movie to an existing theater
   7.8. Admins can create new theaters and seats, as long as they exist in real life.
   7.9. Admins can also watch movies just like a regular User.

8. Account
   8.1. An account contains personal information about the User
   8.2. An account has an email and a password
   8.3. An account has a role that grants the User certain privileges
   8.4. User, Guest, and Admin all require an Account.

9. Payment Info
    9.1. Payment information is linked to an account or a User
    9.2. Payment information can be created, edited, and deleted only by the User
    9.3. Payment information can only be accessed by the User, not even the admin can view it except by deleting it
    9.4. Payment information for a guest is only used once and must be deleted after the transaction is complete

10. Roles
    10.1. There can only be one role assigned for each User
    10.2. Each role gives an account a certain privilege
    10.3. Roles of the same type can be assigned to many Users

Non-functional Database Requirements

1. Media Storage
    1.1. The database must be able to support millions of unique tickets
    1.2. The database must be able to store movies
    1.3. All data has to be backed up by midnight

2. Security
    2.1. All passwords must be encrypted in the database
    2.2. All payment information must be encrypted in the database
    2.3. If payment information comes from a guest, it must be deleted once the monetary transaction is complete

3. Privacy
    3.1. User data will not be sold to third-party companies
    3.2. User data may be used to maximize efficiency to make more sales