UML Class Diagram Description – BEM Theatre System

The UML Class Diagram for the BEM Theatre System models the structure of a movie ticketing platform. It defines the main classes, their attributes and methods, and how they relate to each other. This diagram serves as a blueprint for implementing features like ticket purchasing, showtime scheduling, user management, and administrative control.

1. UserAccount
   Represents a customer who uses the system.

Attributes:

- id: Unique user identifier
- name: Full name
- email: Contact email
- password: Encrypted login password
- paymentMethods[]: List of saved payment options
- loyaltyPoints: Points earned through purchases

Operations:

- validate(): Checks login credentials
- refund(): Requests a refund
- sendByEmail(): Sends confirmation or ticket via email

2. Admin (inherits from UserAccount)
   Represents a staff member with special privileges.

Additional Operations:

- setShowtimes()
- editTheatreAssignment()
- viewLogs()
- overrideTransaction()
- initiateRefund()

3. Movie
   Represents a film available in the system.

Attributes:

- title: Name of the movie
- duration: Length in minutes
- rating: Content rating
- reviews[]: List of critic reviews

Operations:

- getShowtimes(): Returns scheduled showings
- fetchReviews(): Gets review data

4. Showtime
   Represents a scheduled screening of a movie.

Attributes:

- id: Unique identifier
- startTime: Date and time of the showing
- movie: Linked movie
- theatre: Theatre where it's shown
- availableSeats[]: List of seats not yet reserved

Operations:

- reserveSeat(seatId): Reserves a specific seat

5. Theatre
   Represents a physical cinema location.

Attributes:

- id: Unique theatre ID
- location: Address or city
- seats[]: All seats in the theatre

Operations:

- getAvailableSeats(): Returns unreserved seats
- getDeluxeSeats(): Returns seats of type 'Deluxe'

6. Seat
   Represents an individual seat in a theatre.

Attributes:

- id: Seat identifier
- type: Regular or Deluxe
- isAvailable: Whether the seat is free or not

Operations:

- reserve(): Marks seat as taken
- release(): Frees the seat

7. Ticket
   Represents a purchased ticket linked to a user and a showtime.

Attributes:

- ticketId: Unique identifier
- owner: Associated UserAccount
- showtime: Linked Showtime
- seat: Linked Seat
- isNFT: Whether it's a digital token

Operations:

- generateQR(): Creates QR code for ticket
- sendToUser(): Sends ticket to the user

8. PaymentMethod
   Represents a stored payment option.

Attributes:

- type: Payment method (e.g. PayPal, Credit Card)
- details: Encrypted or tokenized info

9. Review
   Represents a review from an external source.

Attributes:

- source: e.g. Rotten Tomatoes or IMDB
- score: Numerical rating
- quote: Critic comment

Relationships:

- UserAccount has many Tickets
- Ticket links to one Showtime and one Seat
- Showtime links to one Movie and one Theatre, and to many Seats
- Theatre contains many Seats (composition)
- Movie aggregates Reviews
- UserAccount aggregates PaymentMethods
- Admin is a subclass of UserAccount

This description covers the complete structure and purpose of the system's classes and their interactions, fulfilling the requirements for a full UML Class Diagram explanation.

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