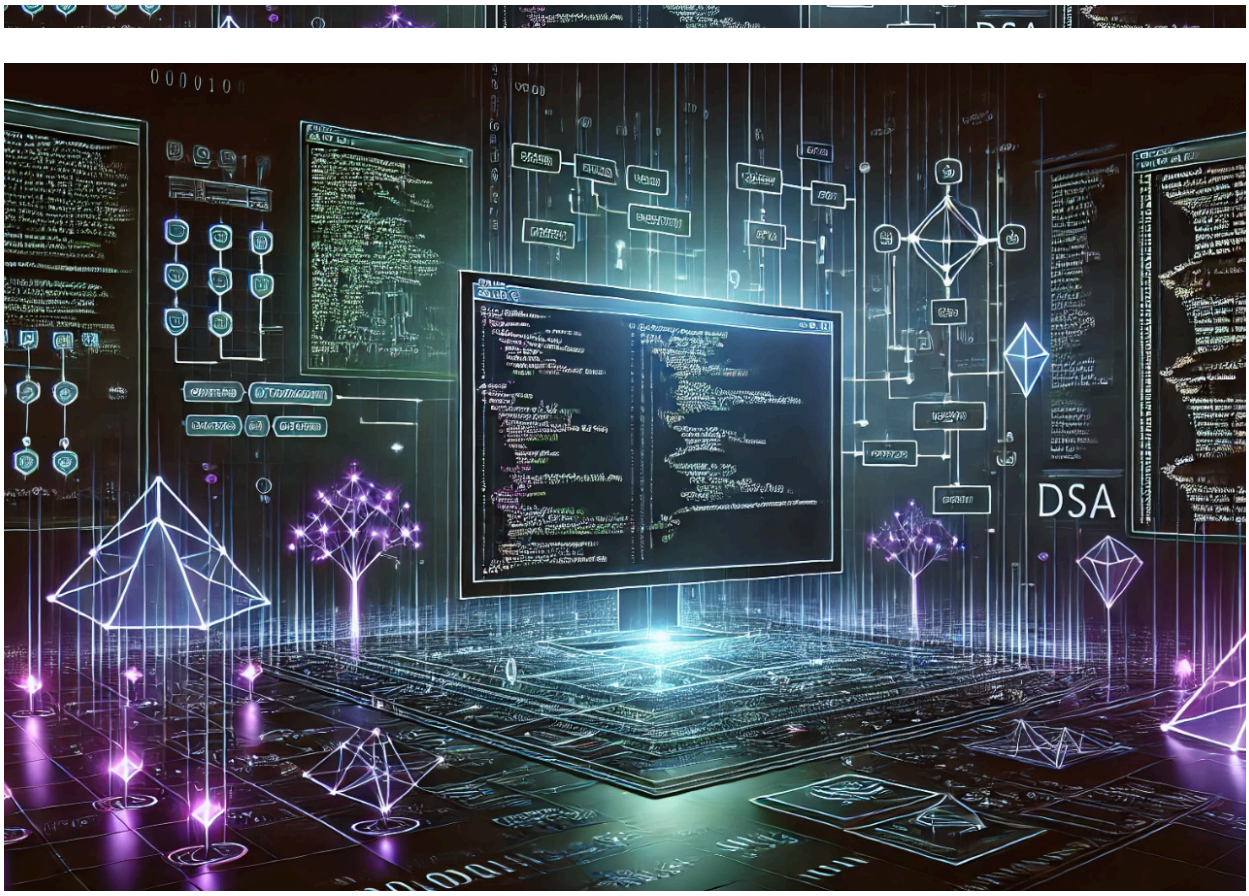


Movie Ticket Booking System

Data Structure and Algorithms

Submitted By:

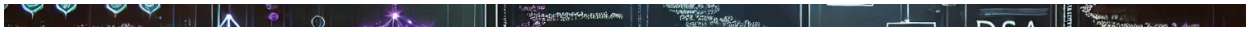
BILAL AQEEL
2023-BS-SE-033

AMINA IJAZ
2023-BS-SE-076

Submitted To:

SIR SAMRAIZ

The University of Faisalabad



Overview

The **Movie Ticket Booking System** lets users browse movies, select showtimes, book seats, and view or cancel bookings. Admins can manage movies, update schedules, and monitor reservations. It's a simple simulation of real-world ticket booking.

Goals

1. **Efficient Booking Process**: Simplifying the process of selecting movies, showtimes, and seats, ensuring a seamless experience for users.
2. **Resource Management**: Automating seat allocation and availability tracking to optimize movie theater operations.

Specifications

User Registration

Allows users to create accounts by providing their details, enabling secure access to the system for booking and managing tickets.

Data Structure:

The most suitable data structure for this is **Hash Tables**

Why:

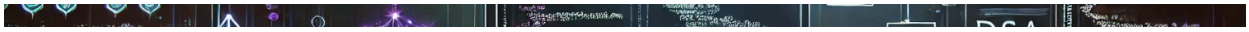
- Fast access for user lookup (e.g., by username, email, or user ID).
- Efficient for managing unique user data.

Admin Panel

A dedicated interface for administrators to manage movies, update showtimes, monitor bookings, and ensure smooth system operations.

Data Structure:

The most suitable data structure for this is also **Hash Tables**



Why:

- Quick lookups for admin actions like finding users, bookings, or movies by unique IDs.
- Efficient for managing entities with unique identifiers (e.g., `movie_id`, `user_id`, or `booking_id`).

Movie and Show Management

Enables the addition, removal, or updating of movies and their showtimes to keep the system up-to-date with current offerings.

Data Structure:

For this we can use the combination of **Linked List and Hash Table.**

Why:

- **Hash Tables** offer quick lookups by movie ID or title (`O(1)` average time complexity).
- **Linked List** can store show timings or movie details in sequential order for easy traversal.

Seating and Booking

Provides a visual representation of available seats, allowing users to select and reserve seats for their chosen movie and showtime.

Data Structure:

For this we can use the **2-D Arrays.**

Why:

- The seating arrangement in a theater is naturally grid-people generally sit in rows and columns.
- A **2D array** allows easy access to individual seats using indices (`row`, `col`).
- You can represent seat states (e.g., `0` for available, `1` for booked).