

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment:2

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Branch: B.E. CSE

Semester:6th

Subject Name: System Design

UID:23BCS11682

Section/Group: 603(A)

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Subject Code:23CSH-314

1. **Aim:** To design and implement an Object-Oriented Movie Ticket Booking System using appropriate class relationships (association, aggregation, composition) to manage movies, shows, seats, and bookings.
2. **Objective:**
 - To apply Object-Oriented Programming (OOP) principles in a real-world scenario.
 - To demonstrate understanding of class relationships: association, aggregation, and composition.
 - To implement a functional movie ticket booking system with core features.
 - To practice creating UML diagrams before coding (optional but recommended).
3. **Tools:** Personal computer/laptop, [Draw.io](https://draw.io), Lucidchart, or PlantUML
4. **Procedure:**

Identify Classes and Relationships

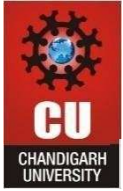
- List required classes: Movie, Theater, Show, Seat, Booking, Customer
- Define relationships between classes

Create UML Class Diagram (optional but helpful)

- Visualize associations, aggregations, and compositions

Implement Classes in Code

- Create classes with appropriate attributes and methods
- Implement relationships using object references



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Test the System

- Create sample data (movies, shows, seats)
- Simulate booking process
- Handle edge cases (seat already booked, invalid show)

Verify Relationships

- Ensure proper object lifecycle (composition vs aggregation)
- Test dependency between objects

5. Implementation:

Design the Class Structure

1. Movie
 - movieId, title, genre, duration, language
2. Theater
 - theaterId, name, location
 - List<Show> shows (Aggregation)
 - List<Seat> seats (Composition)
3. Show
 - showId, movie, startTime, endTime
 - Theater theater (Association)
 - List<Seat> availableSeats
4. Seat
 - seatId, row, seatNumber, seatType (Normal/Premium)
 - boolean isBooked
5. Booking
 - bookingId, customerName, bookingTime
 - Show show (Association)
 - List<Seat> bookedSeats (Aggregation)
 - double totalPrice
6. Customer (optional)
 - customerId, name, email, phone

6. Output:

Figure 1: State Diagram

Figure 2: Sequence Diagram

Movie Ticket Booking System - State Diagram

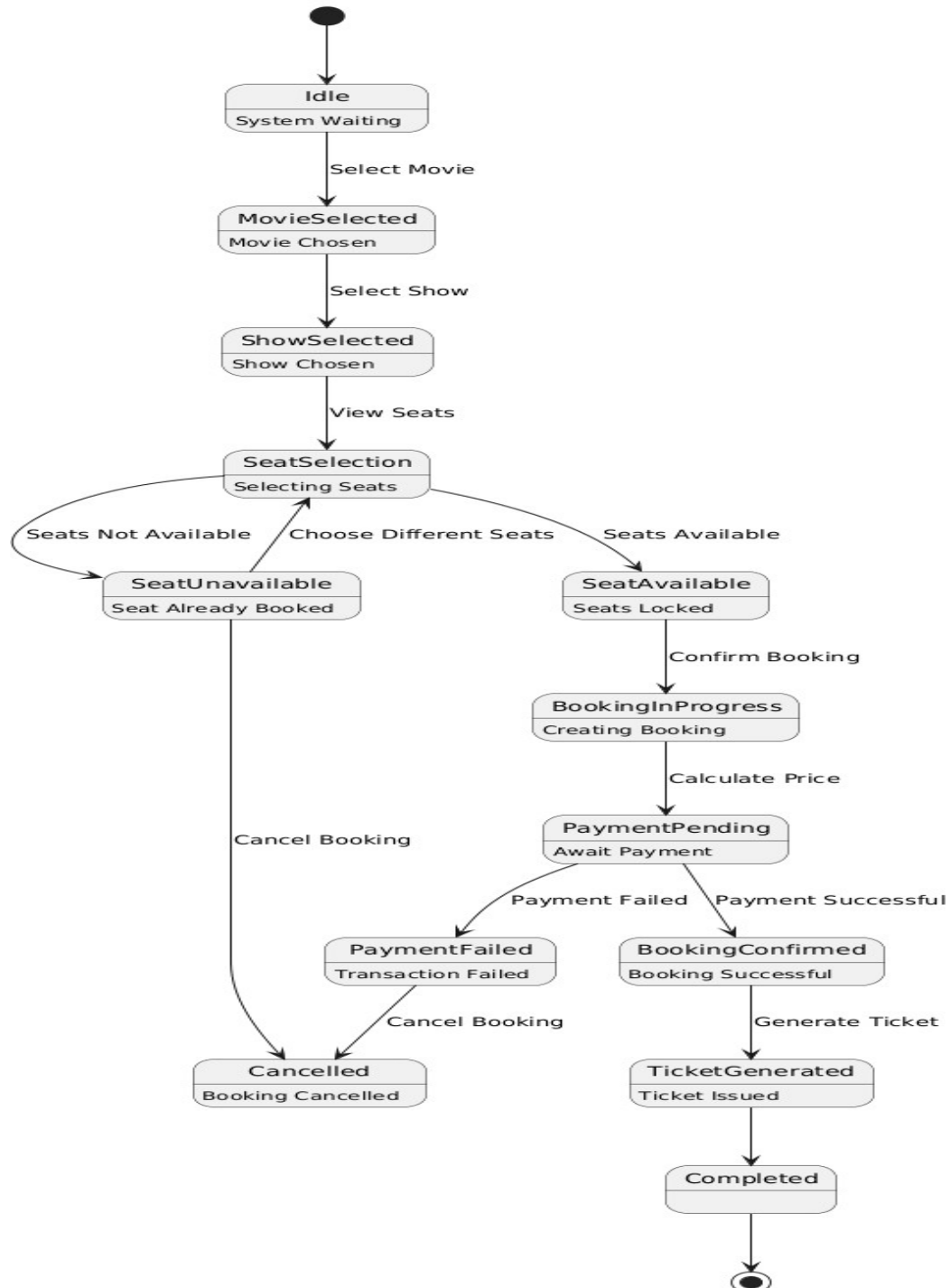
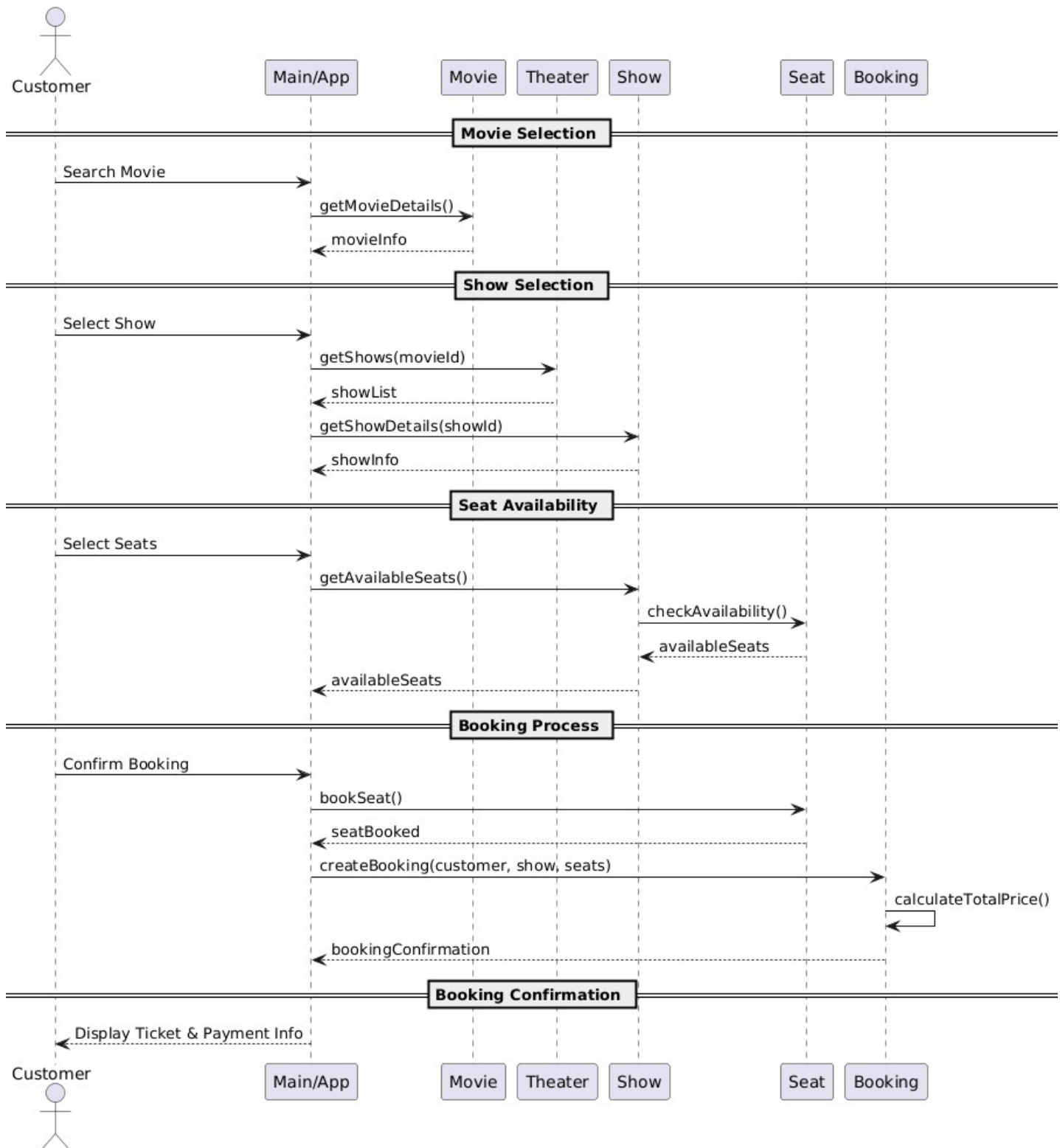


Figure 2

Movie Ticket Booking System - Sequence Diagram





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7. Learning Outcome:

- Learned how to design State Chart Diagram and Sequence Chart Diagram.
- Understood the concept of Unified Modeling language.