

## **CS 202 Lab Assignment 10 (Total Marks= 20)**

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***Movie Hall Ticket Booking System using Java Multithreading*** : A movie theater has limited seats for a particular show. Multiple users (represented as threads) try to book tickets simultaneously through an online system. The goal is to simulate concurrent ticket booking where multiple users attempt to reserve seats, and synchronization ensures that:

- No two users book the same seat.
- The booking count never exceeds total seats available.

Required classes:

1. **MovieHall (shared resource)** – maintains available seats.
2. **User (thread)** – tries to book a given number of tickets.
3. **BookingSystem (main)** – creates threads and manages booking process.

Tasks to accomplish

1. Implement the above system with synchronization so no overbooking occurs.
  - a. Demonstrate what happens if synchronized is removed. **[Marks =6]**
  - b. Observe incorrect seat counts due to race conditions. **[Marks =6]**
2. Modify the program so that if enough seats are *not available*, the user thread waits (`wait()`), and once some seats are freed (by cancellations), it resumes (`notifyAll()`). Add a `cancelTickets()` method for this. **[Marks =8]**