

# Movie Ticket Booking API Report

## 1. Introduction

The **Movie Ticket Booking API** is designed to facilitate seamless booking and management of movie tickets while ensuring proper seat availability and transaction consistency. This API enables users to book, cancel, and view available seats efficiently.

---

## 2. Problem Statement

Develop an API to **book movie tickets and manage seating arrangements** in an efficient and scalable manner.

---

## 3. Concepts Covered

REST API,

Transactions,

Sorting (ORDER BY movie\_time)

---

## 4. Definition of Done (DoD)

**Implemented Features:**

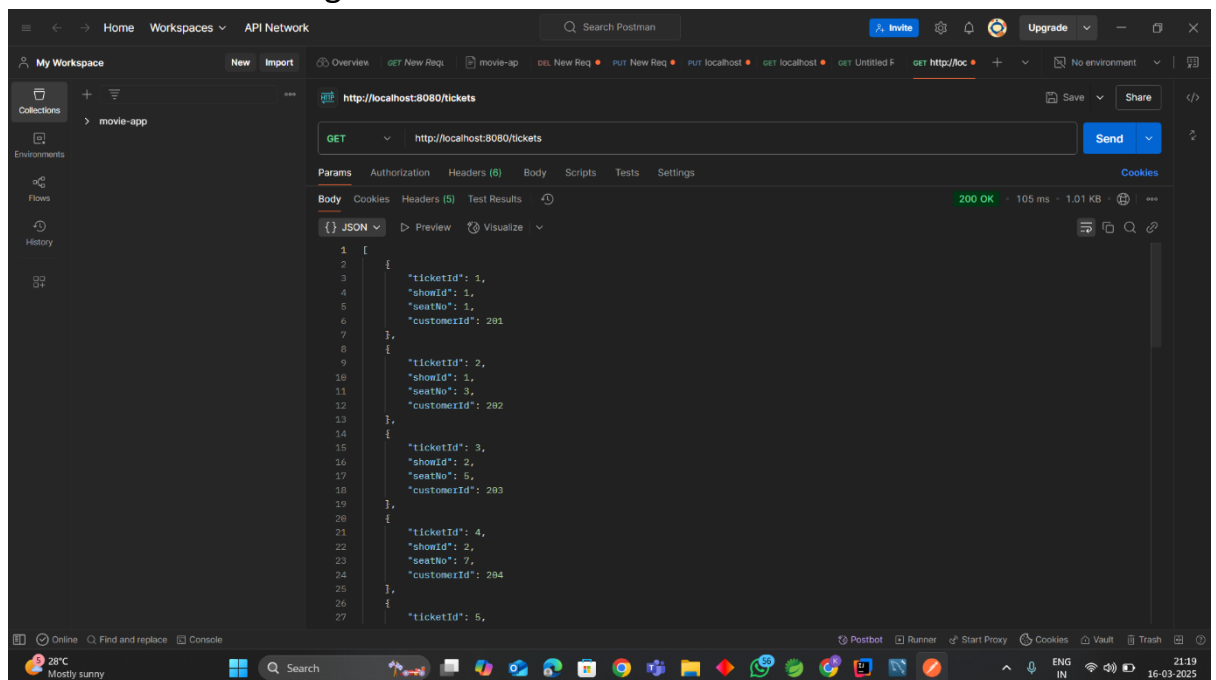
1. **Ticket Booking & Cancellation:** Users can book and cancel tickets dynamically based on seat availability.
2. **Transaction Handling:** Used transactions to prevent duplicate seat bookings, ensuring consistency.
3. **Sorting Mechanism:** Implemented sorting of shows based on **movie\_time (ASC)** to enhance user experience.

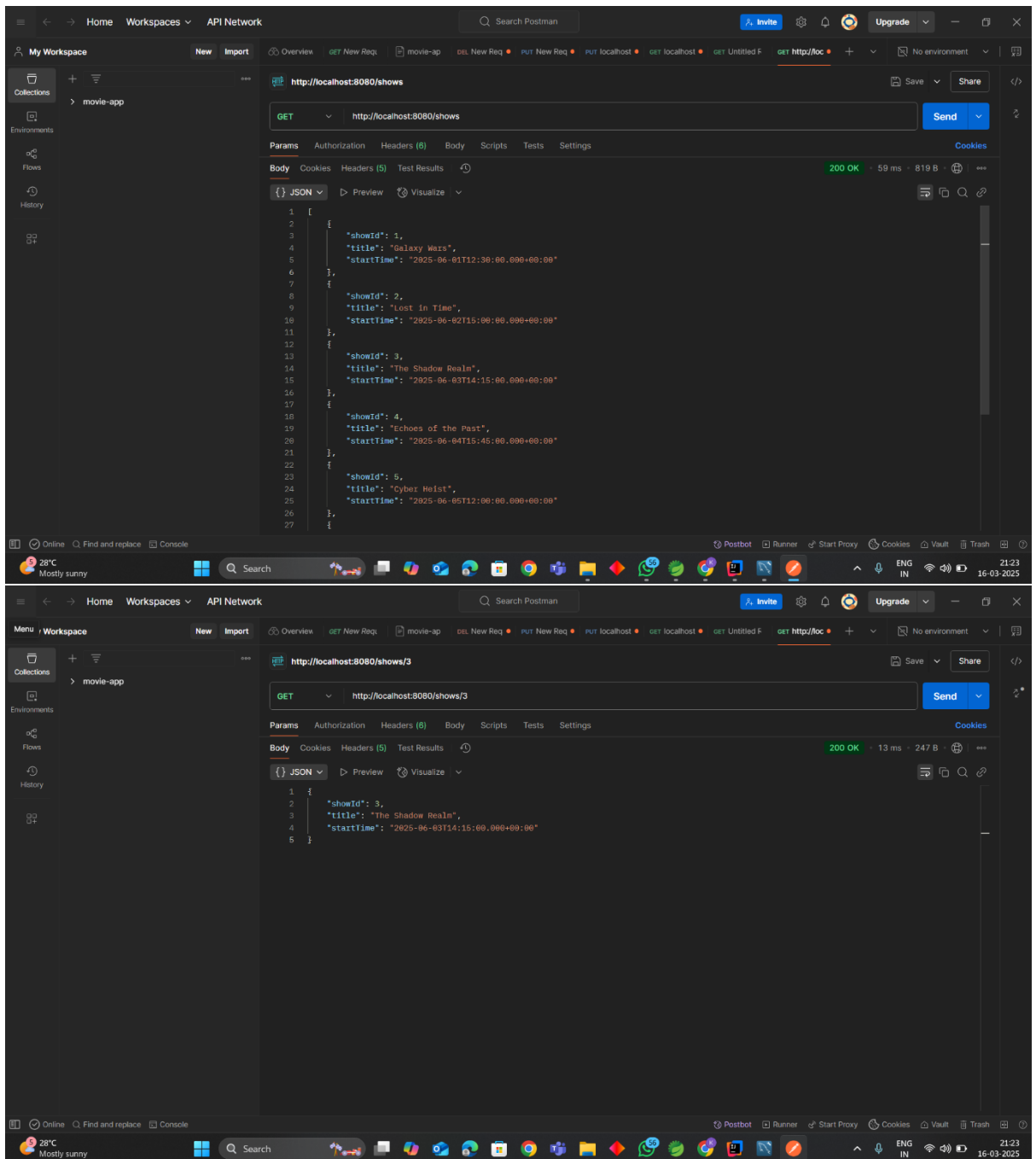
4. **Database Optimization:** Used **NamedParameterJdbcTemplate** for efficient SQL query execution.
  5. **Seat Availability Testing:** API was rigorously tested under various booking scenarios to ensure accuracy.
- 

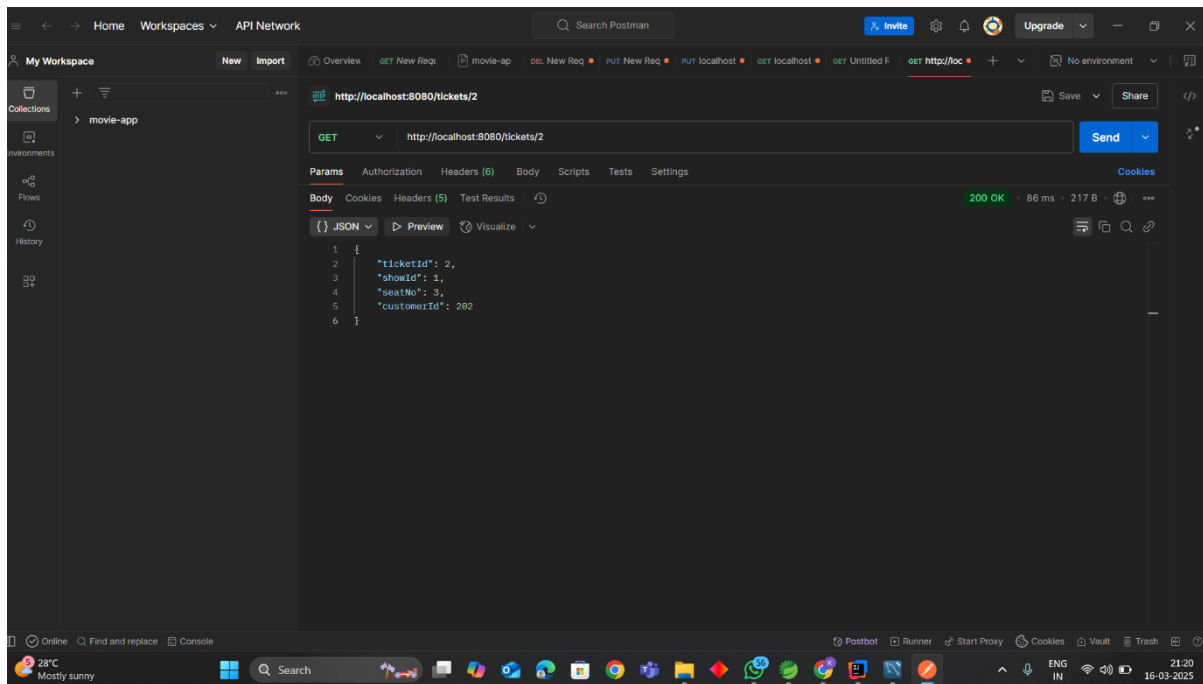
## 5. API Testing

### Tools Used: Postman

- Successfully tested **ticket booking** under various conditions.
- Verified **seat availability changes** post booking & cancellation.
- Ensured transactions were working correctly by attempting simultaneous bookings.







---

## 6. Challenges Faced & Solutions Implemented

### 1 Handling Concurrent Seat Bookings

**Problem:** Multiple users attempting to book the same seat simultaneously led to race conditions. **Solution:** Implemented **database transactions** with locking mechanisms to ensure that no two users could book the same seat at the same time.

### 2 Performance Optimization

**Problem:** As the number of movie shows increased, sorting and querying became slower. **Solution:** Optimized database queries using **indexes** and **NamedParameterJdbcTemplate** to improve query execution time.

**3 Managing rollback scenarios in transactions** – If any step in a multi-step booking process fails, the entire transaction is rolled back to maintain consistency.

---

## 7. Conclusion

The **Movie Ticket Booking API** successfully implements core functionalities such as **booking, cancellation, sorting, and transactions** while ensuring **high performance and reliability**. Future improvements can include **user authentication, seat selection preferences, and real-time notifications**.

---