CASE STUDY: Office Meeting Room Management System with Room Preparation Notifications

---

1. Database Schema

Employee

```
CREATE TABLE employees (
  employee_id INT AUTO_INCREMENT PRIMARY KEY,
  name VARCHAR(100) NOT NULL,
  department VARCHAR(100) NOT NULL,
  email VARCHAR(150) NOT NULL UNIQUE
);
```

Sample data

```
{
  "name": "Reception-Staff",
  "email": "recereceptionstaff@yopmail.com",
  "department": "Reception"
}
```

User

```
CREATE TABLE users (
  user_id      BIGINT AUTO_INCREMENT PRIMARY KEY,
  employee_id INT NOT NULL,
  passwordhash VARCHAR(150),
  role         ENUM('SYSTEM_ADMIN', 'RECEPTION_STAFF', 'INVENTORY_STAFF',
'MAINTENANCE_STAFF') NOT NULL,
  is_active     BOOLEAN DEFAULT TRUE,
  created_at    TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  FOREIGN KEY (employee_id) REFERENCES employees(employee_id)
);
```

Sample Data

```
{
  "userId": 1,
  "employeeId": 1,
  "passwordHash": "$2a$10$VPwqtVUVKQpS168zD3RdSuqpXbD6hyUoRy/pzADacIdejLDmUG7Ru",
```

  "role": "SYSTEM_ADMIN",
 "isActive": true,
 "createdAt": "2025-11-18T12:27:33Z"
}

Meeting Rooms

```
CREATE TABLE meeting_rooms (
  room_id      BIGINT AUTO_INCREMENT PRIMARY KEY,
  room_name    VARCHAR(100) NOT NULL UNIQUE,
  floor        INT,
  capacity     INT,
  has_projector BOOLEAN DEFAULT FALSE,
  has_whiteboard BOOLEAN DEFAULT FALSE,
  status       ENUM('AVAILABLE', 'UNAVAILABLE') DEFAULT 'AVAILABLE'
);
```

Sample Data

{
 "room_id": 1,
 "room_name": "Neem Room",
 "floor": 1,
 "capacity": 12,
 "has_projector": true,
 "has_whiteboard": true,
 "status": "AVAILABLE"
}
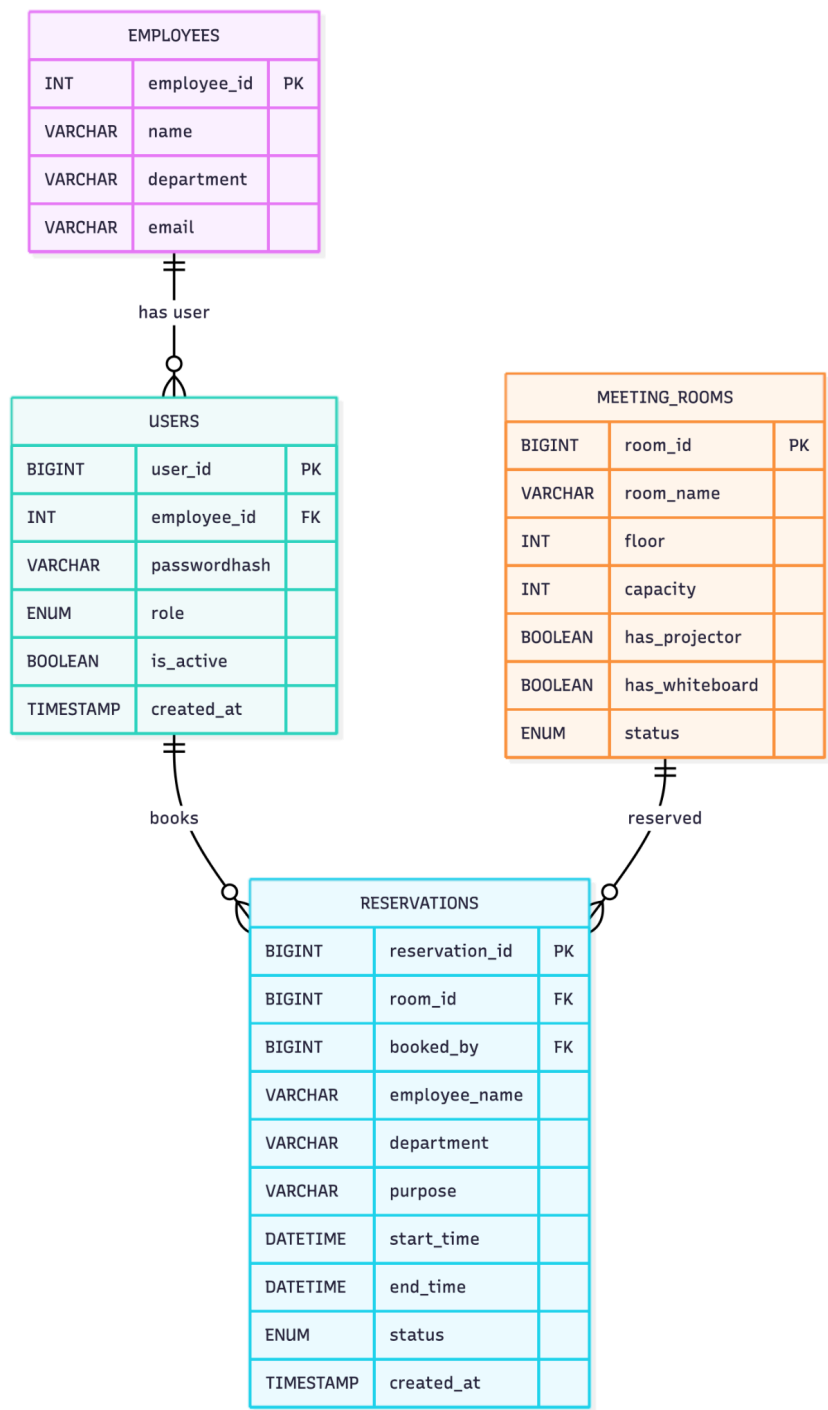
Reservations

```
CREATE TABLE reservations (
  reservation_id BIGINT AUTO_INCREMENT PRIMARY KEY,
  room_id        BIGINT NOT NULL,
  booked_by      BIGINT NOT NULL,
  employee_name  VARCHAR(100) NOT NULL,
  department     VARCHAR(100),
```

```sql
  purpose      VARCHAR(255),
  start_time   DATETIME NOT NULL,
  end_time     DATETIME NOT NULL,
  status       ENUM('BOOKED', 'CANCELLED', 'COMPLETED', 'AUTO_RELEASED') DEFAULT
'BOOKED',
  created_at   TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
  CONSTRAINT fk_reservation_room
    FOREIGN KEY (room_id) REFERENCES meeting_rooms(room_id),
  CONSTRAINT fk_reservation_user
    FOREIGN KEY (booked_by) REFERENCES users(user_id)
);
```
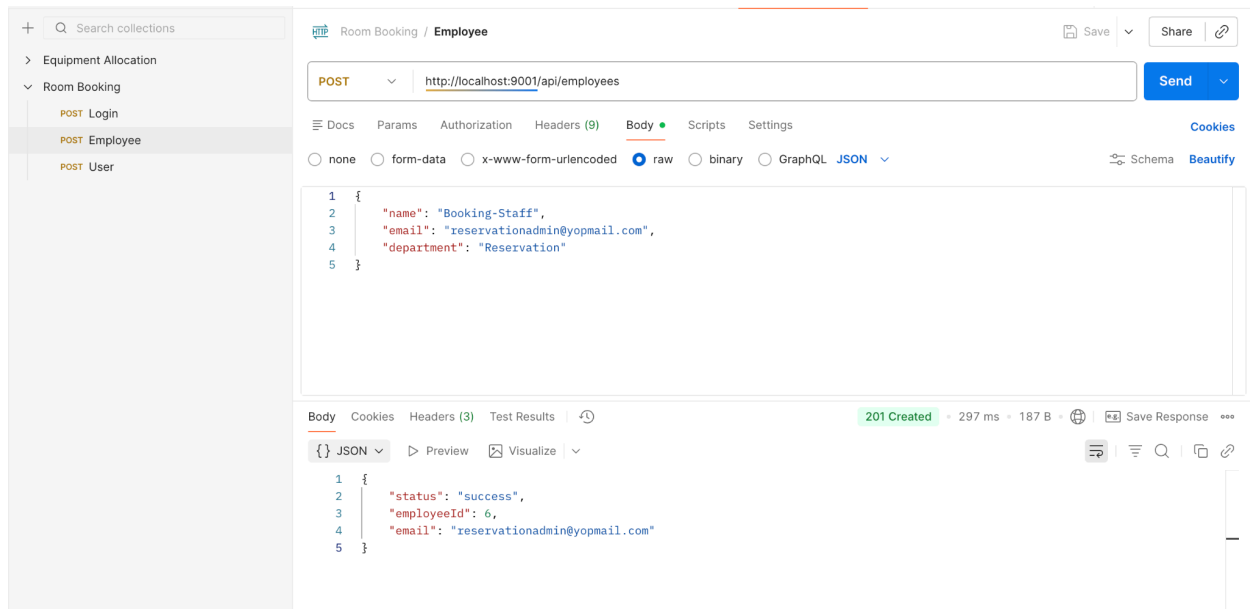
Sample data

```json
{
  "reservation_id": 10,
  "room_id": 4,
  "booked_by": 3,
  "employee_id": 5,
  "purpose": null,
  "start_time": "2025-11-22T13:40:00",
  "end_time": "2025-11-22T14:00:00",
  "status": "BOOKED",
  "special_requirements": null,
  "is_occupied": false,
  "created_at": "2025-11-22T13:17:35"
}
```

2. ER Diagram

EMPLOYEES

INT	employee_id	PK
VARCHAR	name	
VARCHAR	department	
VARCHAR	email	

has user

USERS

BIGINT	user_id	PK
INT	employee_id	FK
VARCHAR	passwordhash	
ENUM	role	
BOOLEAN	is_active	
TIMESTAMP	created_at	

books

MEETING_ROOMS

BIGINT	room_id	PK
VARCHAR	room_name	
INT	floor	
INT	capacity	
BOOLEAN	has_projector	
BOOLEAN	has_whiteboard	
ENUM	status	

reserved

RESERVATIONS

BIGINT	reservation_id	PK
BIGINT	room_id	FK
BIGINT	booked_by	FK
VARCHAR	employee_name	
VARCHAR	department	
VARCHAR	purpose	
DATETIME	start_time	
DATETIME	end_time	
ENUM	status	
TIMESTAMP	created_at	

3. Output screenshots

3.1 Login and staff registration

3.1.1 Login as System Admin

3.1.2 Create and Register Admin Staff

3.2 Meeting Rooms

3.3 Create Meeting Room Reservation
3.3.1 Login as Admin Staff
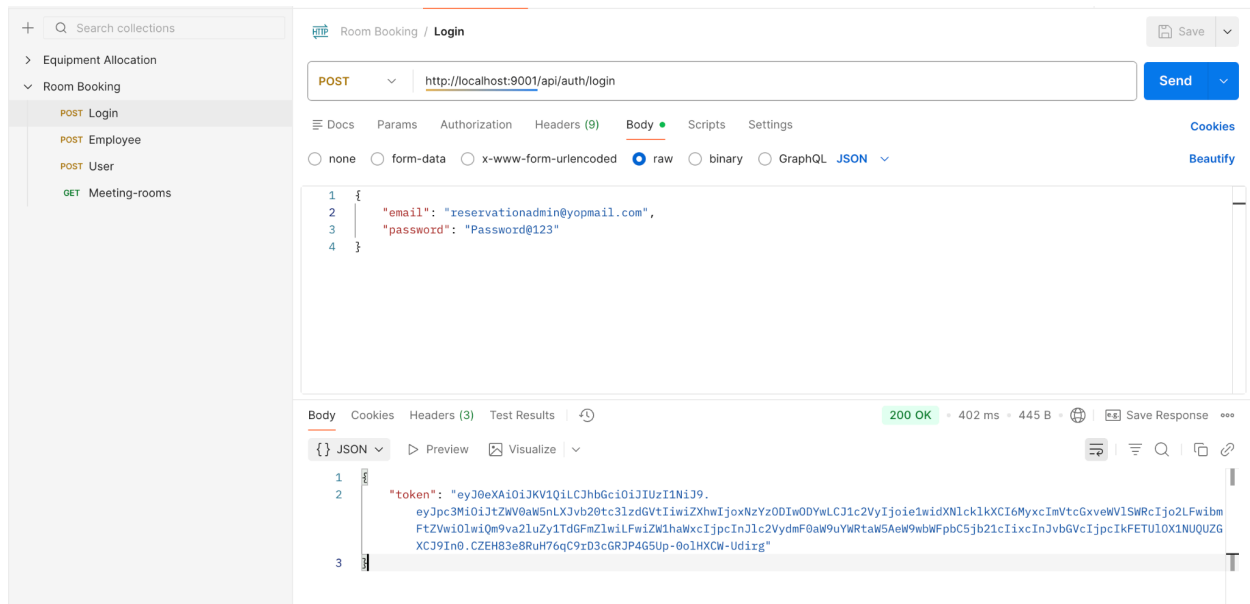
3.3.2 Create reservation and a automated notification will be send to employee and room service for preparing the room
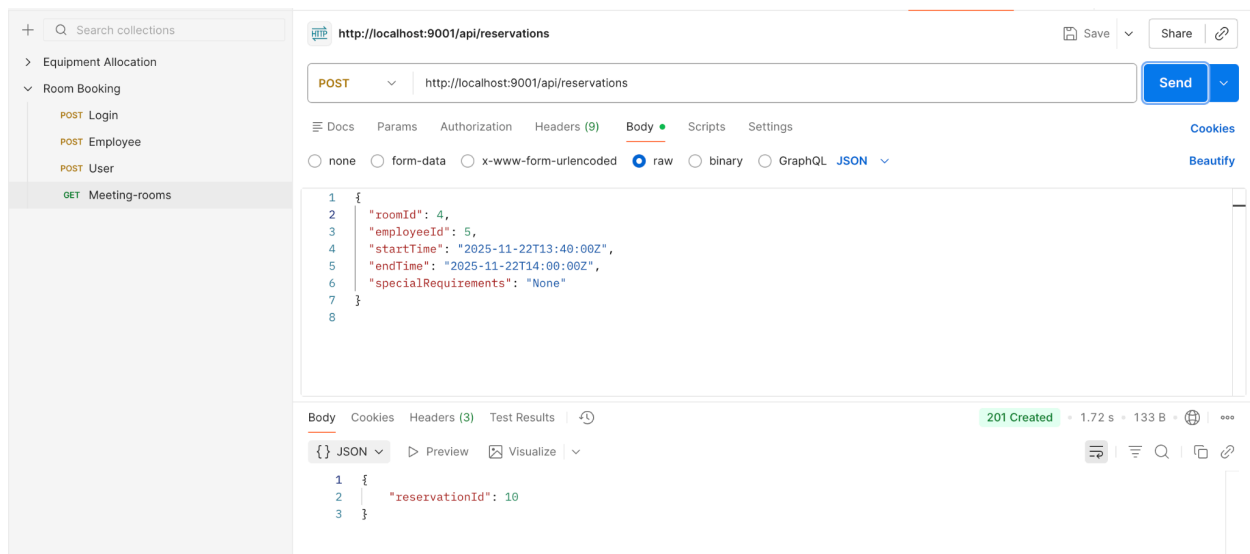
3.3.3 Notifications

Booking Confirmed – Teak Room

S sownthariponnusamy@gmail.com
to ford

6:47 PM (1 minute ago)

Meeting Room Booking Confirmed

Hello **Ford**,

Your meeting room has been successfully booked:

- **Room:** Teak Room
- **Floor:** 1
- **Start:** 22-Nov-2025 07:10 PM
- **End:** 22-Nov-2025 07:30 PM
- **Requirements:** None

Regards,
Admin Team

This is an automated email — please do not reply.

Reply   Forward

Room Setup Required – Teak Room

S sownthariponnusamy@gmail.com
to roomservice

6:47 PM (2 minutes ago)

Room Setup Required

A new meeting is scheduled:

- **Room:** Teak Room
- **Floor:** 1
- **Start:** 22-Nov-2025 07:10 PM
- **Requirements:** None

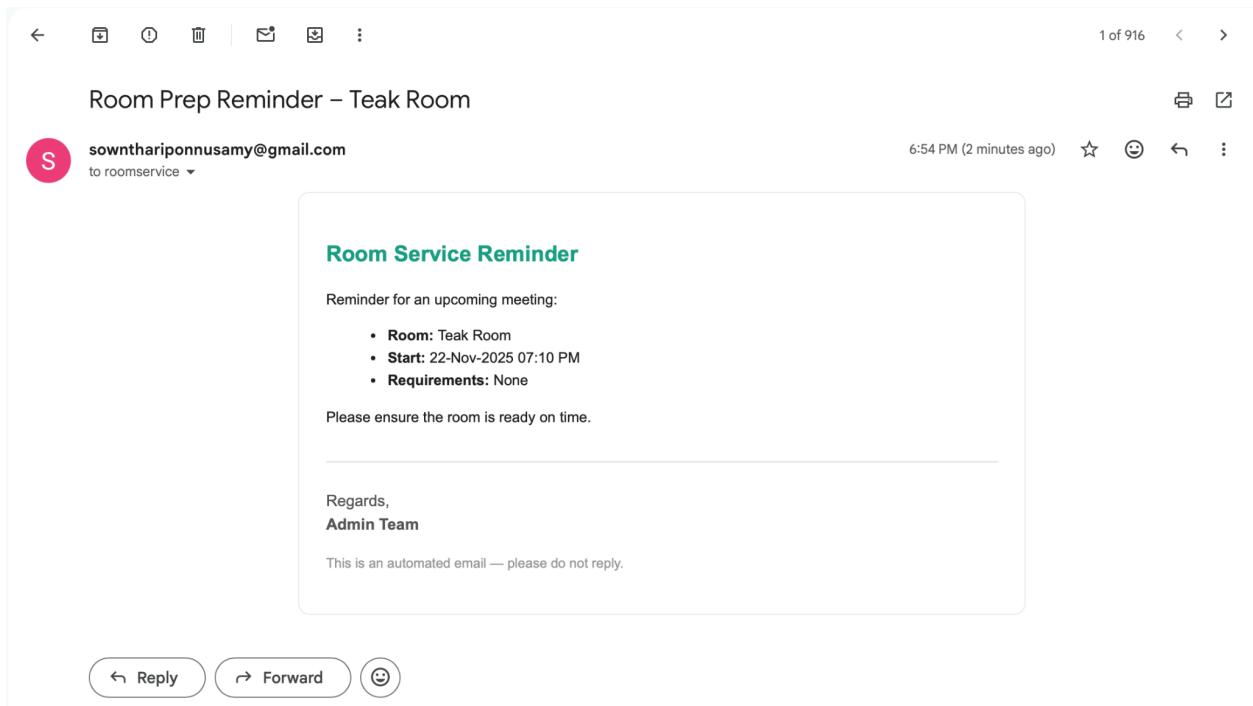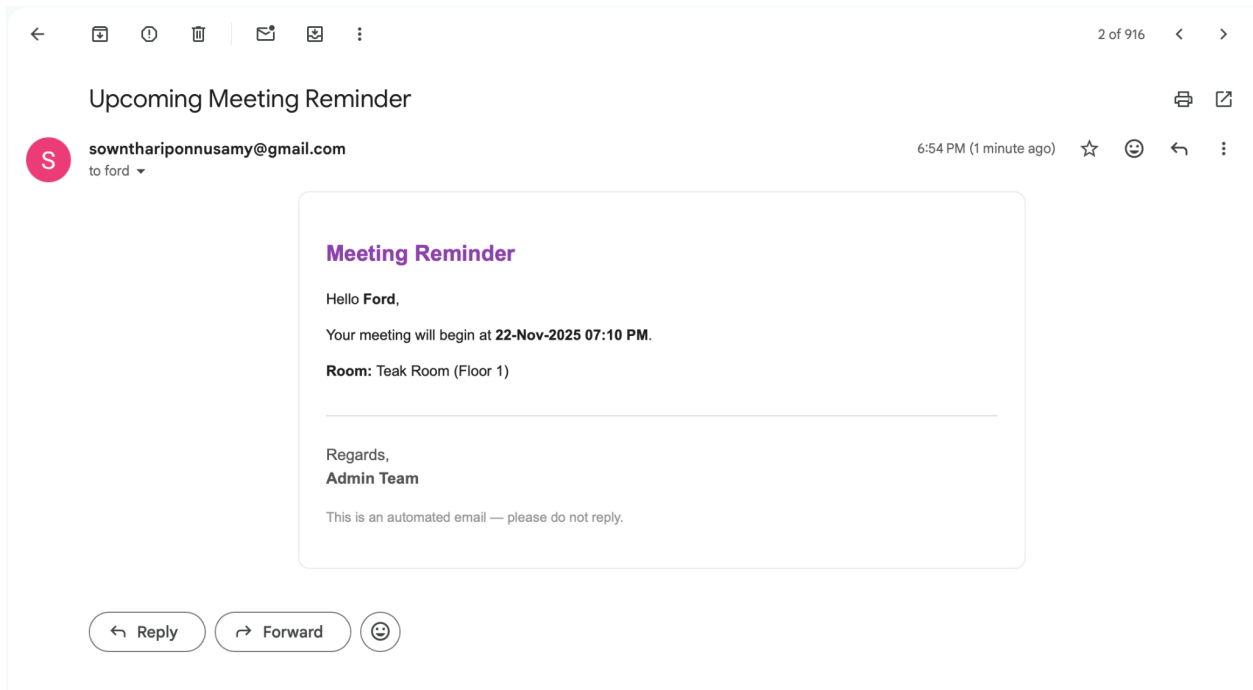Please prepare the room in advance.

Regards,
Admin Team

This is an automated email — please do not reply.

Reply   Forward

3.4 Automated Remainder mail to employee and room service before 15mins of meetings starts

Upcoming Meeting Reminder

sownthariponnusamy@gmail.com
to ford

6:54 PM (1 minute ago)

Meeting Reminder

Hello **Ford**,

Your meeting will begin at **22-Nov-2025 07:10 PM**.

Room: Teak Room (Floor 1)

Regards,
Admin Team

This is an automated email — please do not reply.

Reply   Forward

Room Prep Reminder – Teak Room

sownthariponnusamy@gmail.com
to roomservice

6:54 PM (2 minutes ago)

Room Service Reminder

Reminder for an upcoming meeting:

- **Room:** Teak Room
- **Start:** 22-Nov-2025 07:10 PM
- **Requirements:** None

Please ensure the room is ready on time.

Regards,
Admin Team

This is an automated email — please do not reply.

Reply   Forward

3.5 Auto release if the room is not occupied for 15mins

Reservation Auto-Released – Teak Room

S sownthariponnusamy@gmail.com
to ford ▾

7:25 PM (16 minutes ago)

Reservation Auto-Released

Hello **Ford**,

Your reservation for **Teak Room** was auto-released because the room was not occupied within 15 minutes.

Released At: 22-Nov-2025 07:25 PM

Regards,
Admin Team

This is an automated email — please do not reply.

↩ Reply   ➔ Forward   ☺

Room Reset Required – Teak Room

S sownthariponnusamy@gmail.com
to roomservice ▾

7:25 PM (17 minutes ago)

Room Reset Required

The meeting in **Teak Room** has ended automatically.

- **Room:** Teak Room
- **Released At:** 22-Nov-2025 07:25 PM
- **Floor:** 1

Please reset the room for the next meeting.

Regards,
Admin Team

This is an automated email — please do not reply.

↩ Reply   ➔ Forward   ☺

4 Kafka Consumer Logs

| producer-service | consumer-service | equipment-system | meeting-room-system – Reservation.scala [| reservation-consumer-service – Notifi |

ct ∨   ⟩ EmployeeActor.scala   ⓒ RoomServiceActor.scala   ⓒ AdminStaffActor.scala   🗐 NotificationActor.scala ×   ∨   ⋮   —

🖻 Main ×   ⋮ —

◻ | ⓞ ⊡ ⓠ ⋮

     value.deserializer = class org.apache.kafka.common.serialization.StringDeserializer

18:45:21.951 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.k.c.t.i.KafkaMetricsCollector - initializing Kafka metrics collector
18:45:22.057 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka version: 3.7.0
18:45:22.058 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka commitId: 2ae524ed625438c5
18:45:22.058 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.kafka.common.utils.AppInfoParser - Kafka startTimeMs: 1763817322057
18:45:22.061 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-7] INFO o.a.k.c.c.i.LegacyKafkaConsumer - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.383 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-13] INFO org.apache.kafka.clients.Metadata - [Consumer clientId=consumer-reservation-consumer-gro
18:45:22.385 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-13] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.451 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-15] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.663 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-21] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.664 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-21] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.733 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-22] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.744 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-22] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group
18:45:22.812 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.812 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.816 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerRebalanceListenerInvoker - [Consumer clientId=consumer-reservation-co
18:45:22.828 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.829 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.829 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.ConsumerCoordinator - [Consumer clientId=consumer-reservation-consumer-group-
18:45:22.838 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1
18:45:22.842 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1
18:45:22.852 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-8] INFO o.a.k.c.c.i.SubscriptionState - [Consumer clientId=consumer-reservation-consumer-group-1
[Kafka] Event received: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),R
[EmployeeActor] Booking event: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(
[RoomServiceActor] Setup event: ReservationCreatedEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some
[Kafka] Event received: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(None),Meet
[RoomServiceActor] Preparation reminder: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00
[EmployeeActor] Reminder event: MeetingReminderEvent(reservation-notifications,Teak Room,1,10,5,Ford,ford@yopmail.com,2025-11-22T13:40:00Z,2025-11-22T14:00:00Z,Some(Non
18:54:22.386 [KafkaConsumerStreamSystem-akka.kafka.default-dispatcher-17] INFO o.apache.kafka.clients.NetworkClient - [Consumer clientId=consumer-reservation-consumer-