Scheduling and Appointments - **Real-World Example Step-by-Step**

**💡 Real-Life Analogy (Think Like a Clinic)**

Let’s say:

* 📍 There is a **dialysis center** in Colombo.
* 🛏 The center has **10 dialysis beds**.
* 📆 They run 3 dialysis **sessions per weekday** (morning, afternoon, evening).
* 👨‍⚕️ Each session is optionally supervised by a doctor.
* 👩‍🦰 Patients need to **book an appointment** to get a bed in a session.

**🛠️ Now Walk Through the Process — Step by Step**

**✅ Step 1: Define the Center**

INSERT INTO centers (name, total\_capacity) VALUES ('Colombo Kidney Care', 10);

**✅ Step 2: Add Beds**

INSERT INTO beds (center\_id, code) VALUES

(1, 'BED-A1'), (1, 'BED-A2'), ..., (1, 'BED-A10');

**✅ Step 3: Define a Recurring Session**

*-- Every Monday 10AM–11AM supervised by Dr. Silva*

INSERT INTO sessions (center\_id, doctor\_id, weekday, start\_time, end\_time, default\_capacity)

VALUES (1, 5, 'Mon', '10:00:00', '11:00:00', 10);

**✅ Step 4: System Generates a Session on a Specific Date**

This might happen via cron job or admin panel. Example:

*-- For upcoming Monday, April 8th*

INSERT INTO schedule\_sessions (center\_id, session\_id, session\_date, start\_time, end\_time, available\_beds, created\_by\_id)

VALUES (1, 1, '2025-04-08', '10:00:00', '11:00:00', 10, 2);

**✅ Step 5: Assign Beds to Session**

The system (or staff) maps available beds to this session:

INSERT INTO session\_beds (schedule\_session\_id, bed\_id, status)

VALUES

(1, 1, 'available'),

(1, 2, 'available'),

... up to 10

;

**✅ Step 6: Patient Books an Appointment**

A patient (user\_id: 20) wants to book on April 8 session.

*-- Bed may be assigned later*

INSERT INTO appointments (schedule\_session\_id, patient\_id, staff\_id, doctor\_id, status)

VALUES (1, 20, 4, 5, 'scheduled');

Later, bed may be assigned:

UPDATE appointments SET bed\_id = 2 WHERE id = 1;

UPDATE session\_beds SET status = 'reserved' WHERE bed\_id = 2 AND schedule\_session\_id = 1;

**🧠 Summary of Concepts**

| **Term** | **Meaning** |
| --- | --- |
| **sessions** | Weekly recurring time blocks (e.g., Mon 10AM) |
| **schedule\_sessions** | Real scheduled instance for a specific date (e.g., Apr 8, Mon 10AM) |
| **beds** | Physical dialysis machines (e.g., BED-A1) |
| **session\_beds** | Mapping of which beds are active/available in a session |
| **appointments** | Actual booking by a patient for a session |

**🎯 Business-Level Benefits**

* **Session capacity** = count of available session\_beds
* **Real-time availability** = total beds – booked appointments
* **Audit history** = which staff/doctor handled each patient
* **Flexibility** = cancel/reschedule sessions or mark beds unavailable

**📌 Optional Enhancements**

| **Feature** | **Table or Logic** |
| --- | --- |
| Generate slots in advance | cron + sessions → schedule\_sessions |
| Visual calendar in frontend | Based on schedule\_sessions |
| Daily availability per center | Count of available beds per session |
| Overbooking prevention | Only allow appointments if bed count not exceeded |