

Hospital Management System

(Normalization)

Step 0: Unnormalized Form (UNF)

Problem: This structure includes multivalued and composite fields.

Patient_ID	PatientName	RoomNumbers	AdmissionDates	DoctorNames	Diagnosis/Treatment	BillAmounts
P001	Ishaq	101,102	2024-06-01,2024-06-02	Samir, Karim	Flu/Antibiotics, COVID/IV	100,200

Step 1: First Normal Form (1NF)

Solution: Make fields atomic by splitting multivalued attributes.

Patient_ID	PatientName	RoomNumber	AdmissionDate	DoctorName	Diagnosis	Treatment	BillAmount
P001	Ishaq	101	2024-06-01	Samir	Flu	Antibiotics	100
P001	Ishaq	102	2024-06-02	Karim	COVID	IV	200

Step 2: Second Normal Form (2NF)

Solution: Eliminate partial dependencies. Create separate tables.

Patients

Patient_ID	PatientName
P001	Ishaq

Rooms

Room_ID	RoomNumber
R101	101
R102	102

Doctors

Doctor_ID	DoctorName
D001	Samir
D002	Karim

Admissions

Admission_ID	Patient_ID	Room_ID	DateIn	Doctor_ID
A001	P001	R101	2024-06-01	D001
A002	P001	R102	2024-06-02	D002

MedicalRecords

Record_ID	Admission_ID	Diagnosis	Treatment
MR001	A001	Flu	Antibiotics
MR002	A002	COVID	IV

Bills

Bill_ID	Admission_ID	BillAmount
B001	A001	100
B002	A002	200

Step 3: Third Normal Form (3NF)

Solution: Remove transitive dependencies. Final optimized structure.

Departments

Dept_ID	DeptName
DPT01	Cardiology

Staffs

Staff_ID	Name	Role	Shift	Dept_ID
S001	Ali	Nurse	Night	DPT01

Users

User_ID	Username	Password	Role	Staff_ID
U001	ali123	****	Staff	S001

Appointments

Appointment_ID	Patient_ID	Doctor_ID	AppmntDate	AppmntTime
AP001	P001	D001	2024-06-05	10:00 AM

BillingDetails

Bill_ID	Service_ID	PerformedBy	Quantity	UnitCost
B001	S001	Samir	1	100

Services

Service_ID	ServiceName
S001	X-Ray