

Database Normalization

Patients

<u>patient_ID</u>	Fname	Lname	DOB	gender	age	contact_info
P001	Ali	Said	1990-01-01	Male	34	99887766, 91112233
P002	Sara	Nasser	1985-05-10	Female	39	91234567
P003	Omar	Khaled	1978-03-20	Male	47	90112233, 91118888
P004	Layla	Ahmed	1995-12-25	Female	29	92334455, 92221111
P005	Nasser	Saleh	2001-07-07	Male	23	94556677

(1NF)

<u>patient_ID</u>	Fname	Lname	DOB	gender	age	contact_info
P001	Ali	Said	1990-01-01	Male	34	99887766
P001	Ali	Said	1990-01-01	Male	34	91112233
P002	Sara	Nasser	1985-05-10	Female	39	91234567
P003	Omar	Khaled	1978-03-20	Male	47	90112233
P003	Omar	Khaled	1978-03-20	Male	47	91118888
P004	Layla	Ahmed	1995-12-25	Female	29	92334455
P004	Layla	Ahmed	1995-12-25	Female	29	92221111
P005	Nasser	Saleh	2001-07-07	Male	23	94556677

(2NF)

Patients table

<u>patient_ID</u>	Fname	Lname	DOB	gender	age
P001	Ali	Said	1990-01-01	Male	34
P001	Ali	Said	1990-01-01	Male	34
P002	Sara	Nasser	1985-05-10	Female	39
P003	Omar	Khaled	1978-03-20	Male	47
P003	Omar	Khaled	1978-03-20	Male	47
P004	Layla	Ahmed	1995-12-25	Female	29
P004	Layla	Ahmed	1995-12-25	Female	29
P005	Nasser	Saleh	2001-07-07	Male	23

Patient_Contacts table

<u>patient_ID</u>	contact_info
P001	99887766
P001	91112233
P002	91234567
P003	90112233
P003	91118888
P004	92334455
P004	92221111
P005	94556677

(3NF)

Patients table

<u>patient_ID</u>	Fname	Lname	DOB	gender
P001	Ali	Said	1990-01-01	Male
P001	Ali	Said	1990-01-01	Male
P002	Sara	Nasser	1985-05-10	Female
P003	Omar	Khaled	1978-03-20	Male
P003	Omar	Khaled	1978-03-20	Male
P004	Layla	Ahmed	1995-12-25	Female
P004	Layla	Ahmed	1995-12-25	Female
P005	Nasser	Saleh	2001-07-07	Male

Patient_Contacts table

<u>patient_ID</u>	contact_info
P001	99887766
P001	91112233
P002	91234567
P003	90112233
P003	91118888
P004	92334455
P004	92221111
P005	94556677

Billing

<u>Bill_ID</u>	Total_cost	services	Bill_date	<u>_patient_ID</u>
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<u>Bill_ID</u>	Total_cost	services	Bill_date	<u>_patient_ID</u>
B001	450	X-Ray, Checkup	2025-01-01	P001
B002	600	MRI	2025-02-15	P002
B003	740	Ultrasound, ECG, Checkup	2025-03-05	P003
B004	830	CT Scan, Blood Test	2025-04-20	P004
B005	400	Blood Test	2025-05-12	P005

(1NF)

<u>Bill_ID</u>	Total_cost	services	Bill_date	<u>_patient_ID</u>
B001	450	X-Ray	2025-01-01	P001
B001	450	Checkup	2025-01-01	P001
B002	600	MRI	2025-02-15	P002
B003	740	Ultrasound	2025-03-05	P003
B003	740	ECG	2025-03-05	P003
B003	740	Checkup	2025-03-05	P003
B004	830	CT Scan	2025-04-20	P004
B004	830	Blood Test	2025-04-20	P004
B005	400	Blood Test	2025-05-12	P005

(2NF)

Billing table

<u>Bill ID</u>	Total_cost	Bill_date	<u>_patient ID</u>
B001	450	2025-01-01	P001
B001	450	2025-01-01	P001
B002	600	2025-02-15	P002
B003	740	2025-03-05	P003
B003	740	2025-03-05	P003
B003	740	2025-03-05	P003
B004	830	2025-04-20	P004
B004	830	2025-04-20	P004
B005	400	2025-05-12	P005

Bill_Services table

<u>Bill ID</u>	services
B001	X-Ray
B001	Checkup
B002	MRI
B003	Ultrasound
B003	ECG
B003	Checkup
B004	CT Scan
B004	Blood Test
B005	Blood Test

MedicalRecords

<u>Records_ID</u>	Diagnosis	treatment_plans	date	notes	<u>patient_ID</u>
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<u>Records_ID</u>	Diagnosis	treatment_plans	date	notes	<u>patient_ID</u>
R001	Flu	Rest, Fluids	2025-01-02	Normal	P001
R002	Migraine	Painkillers	2025-02-16	Chronic	P002
R003	Diabetes	Insulin, Diet Plan	2025-03-06	Chronic	P003
R004	Asthma	Inhalers	2025-04-22	Stable	P004
R005	Fracture	Cast, Painkillers	2025-05-13	Healing	P005

(1NF)

<u>Records_ID</u>	Diagnosis	treatment_plans	date	notes	<u>patient_ID</u>
R001	Flu	Rest	2025-01-02	Normal	P001
R001	Flu	Fluids	2025-01-02	Normal	P001
R002	Migraine	Painkillers	2025-02-16	Chronic	P002
R003	Diabetes	Insulin	2025-03-06	Chronic	P003
R003	Diabetes	Diet Plan	2025-03-06	Chronic	P003
R004	Asthma	Inhalers	2025-04-22	Stable	P004
R005	Fracture	Cast	2025-05-13	Healing	P005
R005	Fracture	Painkillers	2025-05-13	Healing	P005

(2NF)

MedicalRecords table

<u>Records_ID</u>	Diagnosis	date	notes	<u>patient_ID</u>
R001	Flu	2025-01-02	Normal	P001
R001	Flu	2025-01-02	Normal	P001
R002	Migraine	2025-02-16	Chronic	P002
R003	Diabetes	2025-03-06	Chronic	P003
R003	Diabetes	2025-03-06	Chronic	P003
R004	Asthma	2025-04-22	Stable	P004
R005	Fracture	2025-05-13	Healing	P005
R005	Fracture	2025-05-13	Healing	P005

Medical_Treatments table

<u>Records_ID</u>	treatment_plans
R001	Rest
R001	Fluids
R002	Painkillers
R003	Insulin
R003	Diet Plan
R004	Inhalers
R005	Cast
R005	Painkillers

Admissions

<u>Admissions ID</u>	date_in	date_out	<u>Room number</u>	<u>.patient ID</u>
A001	2025-01-01	2025-01-03	R101	P001
A002	2025-02-15	2025-02-18	R102	P002
A003	2025-03-05	2025-03-07	R103	P003
A004	2025-04-20	2025-04-23	R104	P004
A005	2025-05-12	2025-05-14	R105	P005

(1NF)

<u>Admissions ID</u>	date_in	date_out	<u>Room number</u>	<u>.patient ID</u>
A001	2025-01-01	2025-01-03	R101	P001
A002	2025-02-15	2025-02-18	R102	P002
A003	2025-03-05	2025-03-07	R103	P003
A004	2025-04-20	2025-04-23	R104	P004
A005	2025-05-12	2025-05-14	R105	P005

(2NF)

Admissions table

<u>Admissions ID</u>	date_in	date_out	<u>patient ID</u>
A001	2025-01-01	2025-01-03	P001
A002	2025-02-15	2025-02-18	P002
A003	2025-03-05	2025-03-07	P003
A004	2025-04-20	2025-04-23	P004
A005	2025-05-12	2025-05-14	P005

Admission_Rooms table

<u>Admissions ID</u>	<u>Room number</u>
A001	R101
A002	R102
A003	R103
A004	R104
A005	R105

Rooms

<u>Room number</u>	type	availability
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<u>Room number</u>	type	availability
R101	ICU	Yes
R102	General	Yes
R103	ICU	No
R104	Private	Yes
R105	General	No

(1NF)

<u>Room number</u>	type	availability
R101	ICU	Yes
R102	General	Yes
R103	ICU	No
R104	Private	Yes
R105	General	No

(2NF)

Rooms table

<u>Room number</u>	type
R101	ICU
R102	General
R103	ICU
R104	Private
R105	General

Room_Types table

type	availability
ICU	Yes
General	Yes
ICU	No
Private	Yes
General	No

Doctors

<u>Doctore_ID</u>	Doctor_Name	specialization	contact_info	<u>Dep_ID</u>
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<u>Doctore_ID</u>	Doctor_Name	specialization	contact_info	<u>Dep_ID</u>
D001	Dr. Nasser	Cardiology	91112233, 99887766	DEP01
D002	Dr. Latifa	Neurology	93334455	DEP02
D003	Dr. Khaled	Endocrinology	95556677, 95556633	DEP03
D004	Dr. Waleed	Orthopedics	92221122	DEP04
D005	Dr. Huda	Pediatrics	94443322	DEP05

(1NF)

<u>Doctore_ID</u>	Doctor_Name	specialization	contact_info	<u>Dep_ID</u>
D001	Dr. Nasser	Cardiology	91112233	DEP01
D001	Dr. Nasser	Cardiology	99887766	DEP01
D002	Dr. Latifa	Neurology	93334455	DEP02
D003	Dr. Khaled	Endocrinology	95556677	DEP03
D003	Dr. Khaled	Endocrinology	95556633	DEP03
D004	Dr. Waleed	Orthopedics	92221122	DEP04
D005	Dr. Huda	Pediatrics	94443322	DEP05

(2NF)

Doctors table

<u>Doctore ID</u>	Doctor_Name	specialization	<u>Dep_ID</u>
D001	Dr. Nasser	Cardiology	DEP01
D001	Dr. Nasser	Cardiology	DEP01
D002	Dr. Latifa	Neurology	DEP02
D003	Dr. Khaled	Endocrinology	DEP03
D003	Dr. Khaled	Endocrinology	DEP03
D004	Dr. Waleed	Orthopedics	DEP04
D005	Dr. Huda	Pediatrics	DEP05

Doctor_Contacts table

<u>Doctore ID</u>	contact_info
D001	91112233
D001	99887766
D002	93334455
D003	95556677
D003	95556633
D004	92221122
D005	94443322

(3NF)

Departments

specialization	<u>Dep_ID</u>
Cardiology	DEP01
Cardiology	DEP01
Neurology	DEP02
Endocrinology	DEP03
Endocrinology	DEP03
Orthopedics	DEP04
Pediatrics	DEP05

Doctors table

<u>Doctore ID</u>	Doctor_Name	<u>Dep_ID</u>
D001	Dr. Nasser	DEP01
D001	Dr. Nasser	DEP01
D002	Dr. Latifa	DEP02
D003	Dr. Khaled	DEP03
D003	Dr. Khaled	DEP03
D004	Dr. Waleed	DEP04
D005	Dr. Huda	DEP05

Doctor_Contacts table

<u>Doctore ID</u>	contact_info
D001	91112233
D001	99887766
D002	93334455
D003	95556677
D003	95556633
D004	92221122
D005	94443322

Appointments

<u>Appointment_ID</u>	time	date_in	date_out	<u>patient_ID</u>	<u>Doctore_ID</u>
<u>AP001</u>	09:00AM	2025-01-01	2025-01-01	P001	D001
<u>AP002</u>	10:00AM	2025-02-15	2025-02-15	P002	D002
<u>AP003</u>	08:00AM	2025-03-05	2025-03-05	P003	D003
<u>AP004</u>	11:00AM	2025-04-20	2025-04-20	P004	D004
<u>AP005</u>	01:00PM	2025-05-12	2025-05-12	P005	D005

Departments

<u>Dep_ID</u>	Dep_name
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<u>Dep_ID</u>	Dep_name
<u>DEP01</u>	Cardiology
<u>DEP02</u>	Neurology
<u>DEP03</u>	Endocrine
<u>DEP04</u>	Orthopedics
<u>DEP05</u>	Pediatrics

Users

<u>username</u>	password	role	<u>staff ID</u>	<u>Doctor ID</u>
anasser	pass123	Doctor	NULL	D001
slatifa	pass456	Doctor	NULL	D002
akhaled	pass789	Doctor	NULL	D003
waleed1	pass234	Doctor	NULL	D004
huda.ped	pass345	Doctor	NULL	D005

(3NF)

Users table

<u>username</u>	password	role
anasser	pass123	Doctor
slatifa	pass456	Doctor
akhaled	pass789	Doctor
waleed1	pass234	Doctor
huda.ped	pass345	Doctor

User_Staff table

<u>username</u>	<u>staff ID</u>
anasser	NULL
slatifa	NULL
akhaled	NULL
waleed1	NULL
huda.ped	NULL

User_Doctor table

<u>username</u>	<u>Doctor ID</u>
anasser	D001
slatifa	D002
akhaled	D003
waleed1	D004
huda.ped	D005

Staff

<u>staff_ID</u>	Staff_Fname	Staff_Lname	salary	assigned_dept	shift	role	contact_info	<u>Dep_ID</u>
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<u>staff_ID</u>	Staff_Fname	Staff_Lname	salary	assigned_dept	shift	role	contact_info	<u>Dep_ID</u>
S001	Ahmed	Ali	1000	DEP01	Day	Nurse	91110000, 99223344	DEP01
S002	Fatima	Zayed	1200	DEP02	Night	Admin	91112221	DEP02
S003	Salem	Khalid	1100	DEP03	Day	Nurse	91119988, 93334455	DEP03
S004	Zainab	Hani	1050	DEP04	Day	Techni cian	91115566	DEP04
S005	Hamad	Nasser	1150	DEP05	Night	Clerk	91113377	DEP05

(1NF)

<u>staff_ID</u>	Staff_Fname	Staff_Lname	salary	assigned_dept	shift	role	contact_info	<u>Dep_ID</u>
S001	Ahmed	Ali	1000	DEP01	Day	Nurse	91110000	DEP01
S001	Ahmed	Ali	1000	DEP01	Day	Nurse	99223344	DEP01
S002	Fatima	Zayed	1200	DEP02	Night	Admin	91112221	DEP02
S003	Salem	Khalid	1100	DEP03	Day	Nurse	91119988	DEP03
S003	Salem	Khalid	1100	DEP03	Day	Nurse	93334455	DEP03
S004	Zainab	Hani	1050	DEP04	Day	Techni cian	91115566	DEP04
S005	Hamad	Nasser	1150	DEP05	Night	Clerk	91113377	DEP05

(2NF)

Staff table

<u>staff_ID</u>	Staff_Fname	Staff_Lname	salary	assigned_dept	shift	role
S001	Ahmed	Ali	1000	DEP01	Day	Nurse
S001	Ahmed	Ali	1000	DEP01	Day	Nurse
S002	Fatima	Zayed	1200	DEP02	Night	Admin
S003	Salem	Khalid	1100	DEP03	Day	Nurse
S003	Salem	Khalid	1100	DEP03	Day	Nurse
S004	Zainab	Hani	1050	DEP04	Day	Technician
S005	Hamad	Nasser	1150	DEP05	Night	Clerk

Staff_Contacts table

<u>staff_ID</u>	contact_info
S001	91110000
S001	99223344
S002	91112221
S003	91119988
S003	93334455
S004	91115566
S005	91113377

Staff_Dep table

<u>staff_ID</u>	<u>Dep_ID</u>
S001	DEP01
S001	DEP01
S002	DEP02
S003	DEP03
S003	DEP03
S004	DEP04
S005	DEP05