DBMS PROJECT

TOPIC: HOSPITAL MANAGEMENT SYSTEM

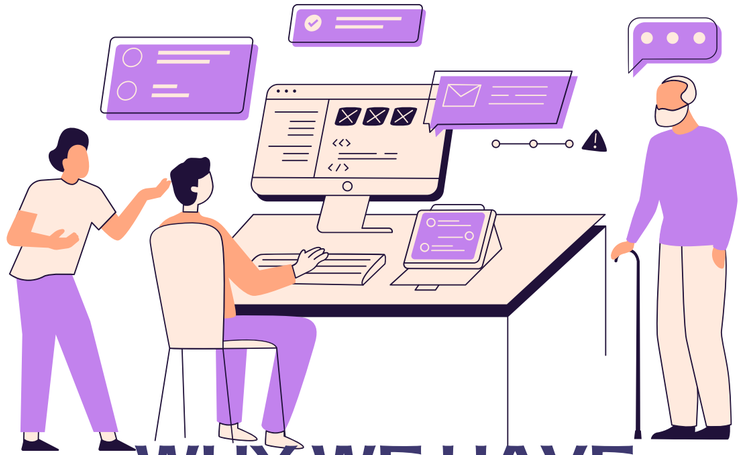
PROJECT DESCRIPTION

THIS PROJECT IS ABOUT CREATING AND MANAGING A HOSPITAL DATABASE SYSTEM. AND THIS PROJECT OFFER USER TO STORE PATIENT, DOCTOR, NURSE, PATHOLOGY, BILLING, PHARMACEUTICAL STORE, ALL IN ONE DATABASE.

ADMINISTER CAN VIEW FOR THE PATIENTS: WHEN, WHY, WHERE THEY ADMITTED.

THIS DATABASE ALSO HELPS TO STORE THE INFORMATION REGARDING EMPLOYEES LIKE DATE OF BIRTH, CONTACT NO, ADDRESS, ETC.

THIS IS SMALL-LEVEL REPRESENTATION OF A VERY LARGE-SCALE DATABASE USED IN REAL LIFE.



WHY WE HAVE CHOOSE THIS TOPIC

HOSPTIALS ARE THE ESSENTIAL PART OF OUR LIVES, PROVIDING BEST MEDICAL FACILITIES TO PEOPLE SUFFERING FROM VARIOUS ALIMENTS, WHICH MAY BE DUE TO CHANGE IN CLIMATIC CONDITIONS, INCREASE WORK-LOAD, EMOTIONAL TRAUMA, STRESS ,ETC. IT IS NECESSARY FOR THE HOSPTIAL TO KEEP OF TRACK OF ITS DAY-TO-DAY ACTIVITES & RECORDS OF ITS PATIENTS, DOCTOR, NURSE AND OTHER IMFROMATION REGARDING HOSPTIAL TO KEEP IT RUNNING SMOOTH & SUCCESSFULL

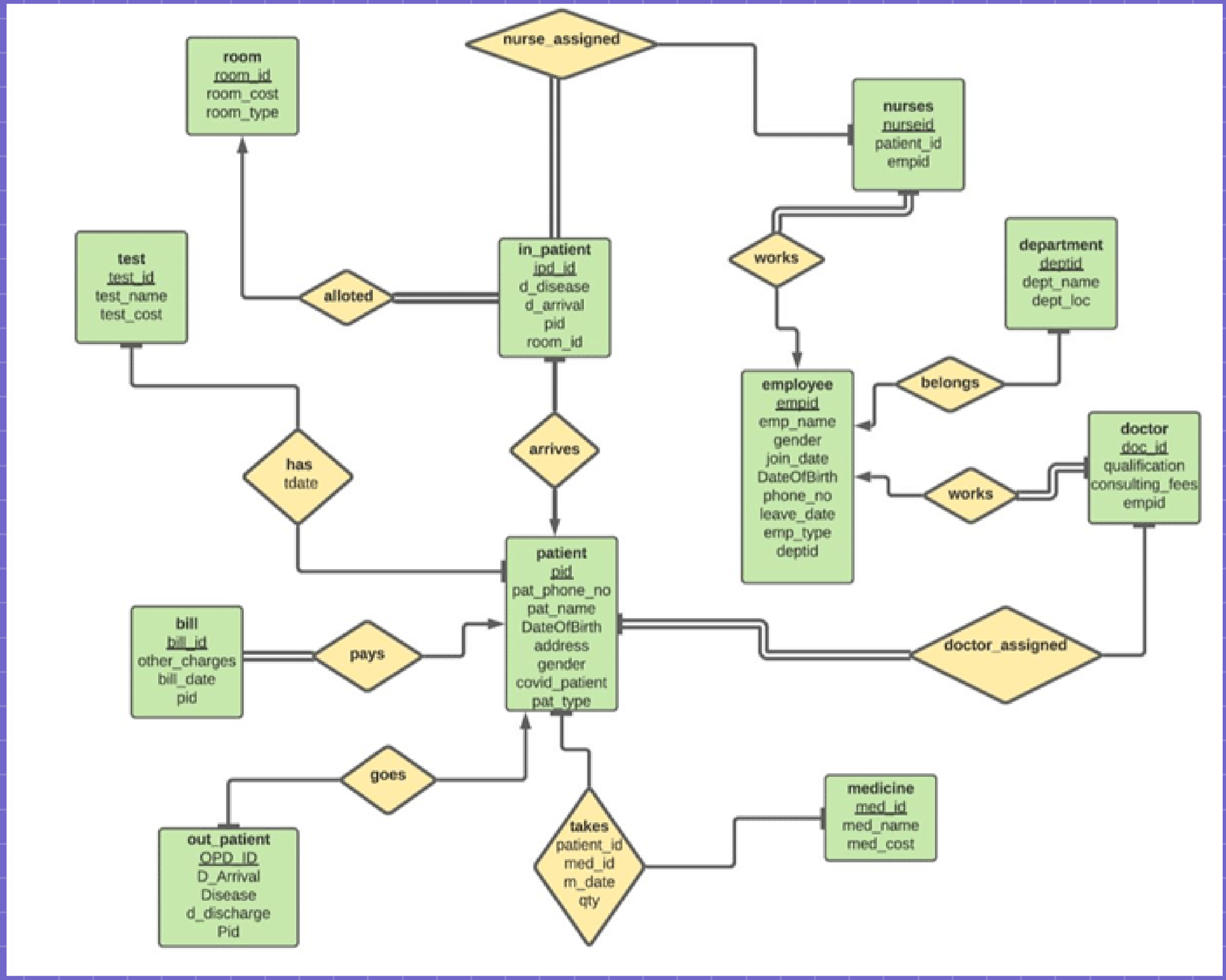
ENTITY SETS

- DOCTOR
- PATIENT
- NURSE
- BILL
- ROOM
- EMPLOYEE
- DEPARTMENT
- TEST
- OUT_PATIENT
- MEDICINE

RELATIONSHIP SETS

- TAKES
- HAS
- DOCTOR_ASSIGNED
- NURSE_ASSIGNED
- WORKS
- ALLOTED
- BELONGS
- ARRIVES
- PAYS
- GOES

ER DIAGRAM


room
room_id
room_cost
room_type
nurse_assigned
nurses
nurseid
patient_id
empid
test
test_id
test_name
test_cost
alloted
in_patient
ipd_id
d_disease
d_arrival
pid
room_id
works
department
deptid
dept_name
dept_loc
belongs
employee
empid
emp_name
gender
join_date
DateOfBirth
phone_no
leave_date
emp_type
deptid
works
doctor
doc_id
qualification
consulting_fees
empid
has
tdate
arrives
patient
pid
pat_phone_no
pat_name
DateOfBirth
address
gender
covid_patient
pat_type
bill
bill_id
other_charges
bill_date
pid
pays
doctor_assigned
goes
out_patient
OPD_ID
D_Arrival
Disease
d_discharge
Pid
takes
patient_id
med_id
m_date
qty
medicine
med_id
med_name
med_cost

INITIAL SCHEMAS

- Doctor(doc_id ,qualification,consulting_fees, empid)
- Nurse (nurseid,patient_count,empid)
- Patient(Pid,Pat_phone_no,pat_name,DateOfBirth,address,gender,covid_patient ,pat_type)
- Department(deptid,dept_name,dept_loc)
- Medicine(med_id,med_name,med_cost)
- Test(test_id,test_name,test_cost)
- Bill(bill_id,other_charges,bill_date,pid)
- Out_patient(OPD_ID,D_Arrival,Disease,d_discharge,Pid)
- Room(room_id,room_cost,room_type)
- Employee(empid, emp_name,gender,join_date, DateOfBirth,phone_no , ,leave_date,emp_type,deptid)

FUNCTIONAL DEPENDENCIES

- Doctor

  F= {doc_id-> (qualification,consulting_fees, empid) ,

  qualification -> consulting_fees}

- Nurse

  F ={nurseid->(patient_count,empid)}

- Patient

  F={Pid- >(Pat_phone_no, pat_name, DateOfBirth, address, gender,

  covid_patient,pat_type),

  covid_patient ->pat_type }

- Department

  F= {deptid-> (dept_name,dept_loc)}

- Test
  F= {test_id-> (test_name,test_cost)}
- Bill.
  F={bill_id-> (other_charges,bill_date,pid)}
- Out_patient
  F={OPD_ID-> (D_Arrival,Disease,d_discharge,Pid)}
- Room
  F= {room_id -> (room_cost,room_type) ,
  room_type -> room_cost}
- Employee
  F = {empid-> (emp_name,gender,join_date, DateOfBirth,phone_no ,
  leave_date,emp_type,deptid)}
- Medicine
  F= {med_id -> (med_name,med_cost)}

1ST NORMAL FORM

Assuming all the attributes of all relations are already atomic, we can infer that all relations are already in 1NF.

2ND NORMAL FORM

Conditions for 2nd normal form are-

- It should be in 1NF
- It should not have any partial dependency.

So, the table is in 1st normal form and now for partial dependency, there is no partial dependency as all entity sets have only one primary key so there is no chance of partial dependency.

Hence all relations are in 2NF.

3RD NORMAL FORM

For 3rd normal form –

- It should be in 1st and 2nd NF
- It should not have a transitive dependency

So there exist transitive in Doctor, Patient and room entity sets

If P -> Q and Q -> R is true, then P-> R is a transitive dependency.
In Doctor set doc_id-> (qualification,consulting_fees, empid) , qualification -> consulting_fees
So in this transitive dependency occurs so, we decompose it to two on the basis of its closure.

In Patient set Pid- >(Pat_phone_no, pat_name, DateOfBirth, address, gender, covid_patient,pat_type),covid_patient ->pat_type , So in this also transitive dependency occurs so decompose it to two on the basis of its closure.

In Room set room_id -> (room_cost,room_type) , room_type -> room_cost
So in this also transitive dependency occurs so decompose it to two on the basis of its closure.

Schemas after decomposing relations to 3rd NF-

- Doctor(doc_id , qualification, empid)
- Doc_qual(qualification,consulting_fees)
- Nurse (nurseid,patient_count,empid)
- Patient(Pid,Pat_phone_no,pat_name,DateOfBirth,address,gender,covid_patient)
- Cov_patient(covid_patient,pat_type)
- Department(deptid,dept_name,dept_loc)
- Medicine(med_id,med_name,med_cost)
- Test(test_id,test_name,test_cost)
- Bill(bill_id,other_charges,bill_date,pid)
- Out_patient(OPD_ID,D_Arrival,Disease,d_discharge,Pid)
- Room(room_id,room_type)
- Type_cost(room_cost,room_type)
- Employee(empid, emp_name,gender,join_date, DateOfBirth,phone_no , leave_date, emp_type,deptid)

FUNCTIONAL DEPENDENCIES

- Doctor
  F= {doc_id-> empid, qualification}
- Doc_qual
  F= {qualification -> consulting_fees}
- Nurse
  F ={nurseid->(patient_count,empid)}
- Patient
  F={Pid- >(Pat_phone_no, pat_name, DateOfBirth, address, gender, covid_patient)}
- Cov_patient
  F= {covid_patient ->pat_type }
- Department
  F= {deptid-> (dept_name,dept_loc)}

- Medicine
  F= {med_id -> (med_name,med_cost)}
- Test
  F= {test_id-> (test_name,test_cost)}
- Bill
  F={bill_id-> (other_charges,bill_date,pid)}
- Out_patient
  F={OPD_ID-> (D_Arrival,Disease,d_discharge,Pid)}
- Room
  F= {room_id -> room_type }
- Type_cost
  F= {room_type -> room_cost}
- Employee
  F = {empid-> (emp_name,gender,join_date, DateOfBirth,phone_no ,
  leave_date,emp_type,deptid)}

From the functional dependency (formed after 3rd normal form) We get to know that in all functional dependencies LHS of them is a candidate key in their respective entity set

BCNF NORMAL FORM

All entity sets are reduced to BCNF

ALL THE TABLES AFTER REDUCING UPTO BCNF

1.DEPARTMENT

deptid	dept_name	dept_loc
DPT01	Physiotherapy	Building 3, left wing A block
DPT02	Neurology	Building 2, left wing C block
DPT03	Ortho	Building 3, left wing A block
DPT04	Psychology	Building 1, left wing B block
DPT05	Gynaecology	Building 1, left wing C block
DPT06	Medicine	Building 1, left wing A block
DPT07	Gastroentrology	Building 3, left wing B block
DPT08	Cardiac	Building 2, left wing A block
DPT09	ENT	Building 3, left wing A block
DPT10	General Surgery	Building 2, left wing B block
DPT11	Anaesthetics	Building 1, left wing A block
NULL	NULL	NULL

2.DOCTOR

doc_id	qualification	empid
DOC01	MBBS	EM001
DOC02	MBBS	EM002
DOC03	MBBS	EM003
DOC04	MD	EM004
DOC05	MS	EM005
DOC06	MD	EM006
DOC07	MS	EM007
DOC08	MD	EM008
DOC09	MD	EM009
NULL	NULL	NULL

3. NURSE

nurseid	patient_count	empid
NUR01	1	EM010
NUR02	1	EM011
NUR03	1	EM012
NUR04	2	EM013
NUR05	1	EM014
NUR06	2	EM015
NULL	NULL	NULL

4.PATIENT

pid	Pat_phone_no	pat_name	DateOfBirth	addres	gender	covid_patient
PAT001	0123456789	Reena	1991-05-04	Dadar(e), Mumbai	f	y
PAT002	1123456789	Parul	1965-10-24	Malad (e),Mumbai	f	y
PAT003	2123456789	Bhuvi	1984-05-04	Sion,Mumbai	m	n
PAT004	3123456789	Rakesh	2001-04-13	Nacharam,Hyderabad	m	n
PAT005	4123456789	Lokesh	1984-04-25	Kemps Corner,Mumbai	m	n
PAT006	5123456789	Laxmi	2001-04-25	Khar (west),Mumbai	f	n
PAT007	6123456789	Rahul	1984-04-19	Kopri Colony,Mumbai	m	n
PAT008	7123456789	Mona	2001-04-13	Purasaiwalkam,Chennai	f	n
PAT009	8123456789	Vinita	1984-04-25	Moti Bagh,Delhi	f	n
PAT010	9123456789	Tushar	1990-05-04	Fort,Mumbai	m	y
PAT011	0223456789	Karan	1984-04-19	Kandivali (west),Mumbai	m	y
PAT012	0323456789	Aditi	1979-05-04	K G Marg,Delhi	f	y
PAT013	0423456789	Harsh	1979-04-13	Somajiguda,Hyderabad	m	y
PAT014	0523456789	Jasmin	1990-04-19	Kalbadevi,Mumbai	f	y
PAT015	0623456789	Deepak	1979-05-04	Kandivali (west),Mumbai	m	y
NULL	NULL	NULL	NULL	NULL	NULL	NULL

5.EMPLOYEE

empid	emp_name	gender	join_date	DateOfBirth	phone_no	leave_date	emp_type	deptid
EM001	Akshay	m	2019-07-21	1989-12-21	1234567890	NULL	doc	DPT06
EM002	Raj	m	2017-12-12	1981-12-12	1234567899	NULL	doc	DPT08
EM003	Ravi	m	2018-04-09	1991-11-10	1234567898	NULL	doc	DPT05
EM004	Darshan	m	2015-05-24	1986-03-16	1234567897	2020-05-24	doc	DPT04
EM005	Laveena	f	2021-01-13	1981-10-19	1234567896	NULL	doc	DPT03
EM006	Harsheen	f	2020-04-16	1986-03-16	1234567895	NULL	doc	DPT07
EM007	Nikhal	m	2019-01-08	1983-10-19	1234567894	NULL	doc	DPT02
EM008	Adit	m	2019-03-21	1992-03-11	1234567893	NULL	doc	DPT09
EM009	Manish	m	2015-09-21	1992-10-19	1234567892	2021-01-15	doc	DPT06
EM010	Muskhesh	m	2018-08-29	1993-11-10	1234567891	NULL	nur	NULL
EM011	Riya	f	2016-12-31	1993-01-10	1234567800	NULL	nur	NULL
EM012	Seema	f	2016-10-26	1993-01-01	1234567880	NULL	nur	NULL
EM013	Joyti	f	2019-04-15	1996-01-20	1234567870	NULL	nur	NULL
EM014	Poorvi	f	2017-05-01	1991-10-18	1234567860	NULL	nur	NULL
EM015	Priya	f	2018-10-10	1981-01-15	1234567850	NULL	nur	NULL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

6.OUT_PATIENT

OPD_ID	D_Arrival	Disease	d_discharge	Pid
OPD01	2020-10-21	Heart attack	2020-12-14	PAT001
OPD02	2021-04-13	Gastric	2021-05-14	PAT004
OPD03	2021-04-16	Lung Infection	2021-05-30	PAT006
OPD04	2020-09-27	Ear Pain	2020-10-02	PAT007
OPD05	2021-01-21	Fever	2021-01-25	PAT009
OPD06	2021-03-13	Throat Infection	2021-04-11	PAT011
OPD07	2021-05-09	Lung Infection	2021-06-07	PAT012
OPD08	2021-04-12	Covid	2021-04-22	PAT013
OPD09	2021-05-01	White Fungus	2021-05-22	PAT014
NULL	NULL	NULL	NULL	NULL

7.IN_PATIENT

ipd_id	d_disease	d_arrival	pid	room_id
IPD01	Heart-Attack	2021-06-19	PAT002	R001
IPD02	Gestational-Diabetes	2021-06-17	PAT003	R002
IPD03	Kidney Transplant	2021-06-04	PAT005	R004
IPD04	Hernia	2021-05-25	PAT008	R005
IPD05	Femur Fracture	2021-06-12	PAT010	R005
IPD06	Appendicitis	2021-05-30	PAT015	R007
NULL	NULL	NULL	NULL	NULL

8.ROOM

room_id	room_type
R001	single
R002	double
R003	dorm
R004	single
R005	double
R006	dorm
R007	single
R008	double
R009	dorm
R010	single
R011	double
R012	dorm
NULL	NULL

9.MEDICINE

med_id	med_name	med_cost
MED01	Remdesivir	900
MED02	Citzin	70
MED03	Aspirin	1000
MED04	Wararin	2000
MED05	Insulin-A	600
MED06	Glynase	700
MED07	Paracetamol	100
NULL	NULL	NULL

10.TEST

test_id	test_name	test_cost
TES01	Troponin Test	1500
TES02	CK-MB Test	2000
TES03	Serum Myoglobin Test	1700
TES04	Random Blood Sugar Test	500
TES05	Fasting Blood Sugar Test	500
TES06	IC PCR Test	1000
NULL	NULL	NULL

11.TAKES

med_id	patient_id	m_date	qty
MED01	PAT001	2020-11-21	2
MED01	PAT002	2021-06-24	3
MED01	PAT013	2021-04-18	10
MED01	PAT014	2020-05-03	10
MED02	PAT004	2021-04-20	8
MED02	PAT009	2011-05-26	10
MED04	PAT005	2021-06-27	2
MED04	PAT010	2021-06-23	10
MED04	PAT012	2021-06-02	10
MED05	PAT003	2021-06-22	6
MED05	PAT007	2021-09-28	10
MED05	PAT011	2021-03-14	10
MED05	PAT015	2020-06-06	10
MED06	PAT006	2021-04-19	10
MED07	PAT008	2021-01-22	10
NULL	NULL	NULL	NULL

12.BILL

bill_id	other_charges	bill_date	pid
BILL01	1000	2020-12-14	PAT001
BILL02	100000	2021-06-30	PAT002
BILL03	900	2021-06-22	PAT003
BILL04	1200	2021-05-14	PAT004
BILL05	55000	2021-06-22	PAT005
BILL06	2000	2021-05-30	PAT006
BILL07	1600	2020-10-02	PAT007
BILL08	35000	2021-06-10	PAT008
BILL09	1100	2021-01-25	PAT009
▶ BILL10	65000	2021-06-30	PAT010
BILL11	3000	2021-04-11	PAT011
BILL12	1200	2021-06-07	PAT012
BILL13	1000	2021-04-22	PAT013
BILL14	900	2021-05-22	PAT014
BILL15	90000	2021-06-21	PAT015
NULL	NULL	NULL	NULL

13.HAS

test_id	pid	tdate
TES02	PAT002	2021-06-20
TES03	PAT004	2021-05-09
TES04	PAT008	2021-05-30
TES05	PAT015	2021-06-01
TES06	PAT002	2021-06-20
▶ TES06	PAT003	2021-06-19
TES06	PAT010	2021-06-16
NULL	NULL	NULL

14.COV_PATIENT

covid_patient	pat_type
n	opd
y	ipd
NULL	NULL

15.TYPE_COST

room_cost	room_type
1000	dorm
2000	double
4000	single
NULL	NULL

16.DOC_QUAL

qualification	consulting_fees
MBBS	3000
MD	8000
MS	4000
NULL	NULL