Hospital Management System
CDS-302-DL3 SPRING 2024

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Introduction

The final project topic is hospital management system, which is being created by myself. The schema and the data were inserted into the database with many tables of data. The database to be developed will consist of the following tables: Nurse, Department, Physician, Patient, Room, Prescription, Appointment, Procedure, Trained-in, affiliated with, Medication, Stay, on-call, Undergoes. The goal is to get real-time experience dealing with the kinds of challenges healthcare workers can find in a real hospital, like keeping track of patients and appointments.

The system is used strictly by employees of hospital only. There are several locations of hospital and many relational tables of data. It creates a systematic and standardized record of Patients, Doctors, and Rooms, which can be controlled only by the administrator. The system should be able to query information about room and patient assignments for each employee of a department. The database should be able to store patient information for use by employees such as Patient ID, Name, Location, Room number, Assigned staff, Prescriptions, and Invoices to generate reports. etc. All patients and doctors will have a unique and will be related in the database depending on the ongoing treatments. Also, There are separate modules for hospital admission, patients' discharge summary, duties of nurses and ward boys, medical stores, etc.

ER Diagram

Relational schema:

Block (**blockcode, blockfloor**)

Nurse (**employeeid**, name, position, registered, ssn)

Physician (**employeeid**, name, position, ssn)

Department (**departmentid**, name, head)

Appointment (**appointmentid**, patient, prepnurse, Physician, start-dt, end-dt, examinationroom)

Room (**roomnumber**, roomtype, blockfloor, blockcode, unavailable)

Procedures (**code**, name, cost)

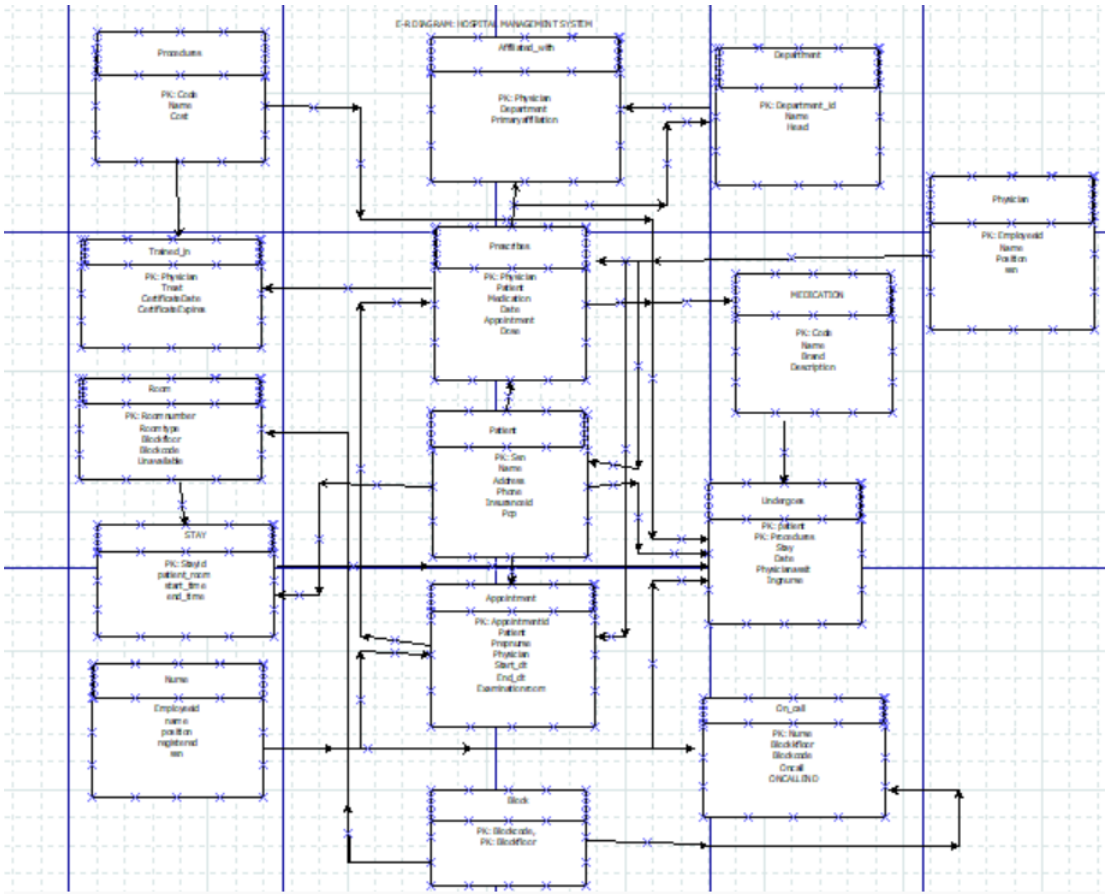
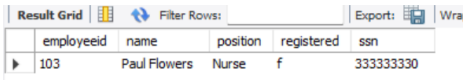


Figure 1: ER Diagram - Hospital Management System

Traine-in (**physician**, treatment, certificationdate, certificationexpires)
Affiliated-with (**physician**, department, primaryaffiliation)
Patient(**ssn**,name,address,phone,insuranceid,pcp)
Prescribes (**physician**, patient, medication, date, appointment, dose)
MEDICATION (**code**, name, brand, description)
STAY(**stayid**,patient-room,start-time,end-time)
On-call**nurse**,blockkfloor,blockcode,oncall,ONCALLEND)
Undergoes(**patient**, procedures, stay, date, physicianassit, ingnurse)

Data Analysis

For our hospital database, the staff are the users and below are some of the tasks that will be performed by the staff of the hospital:



employeeid	name	position	registered	ssn
103	Paul Flowers	Nurse	f	333333330

Figure 2: A nurse who is yet to be registered

*P*atient/Nurse registration *P*atient/Nurse check out *G*eneration of patient/Nurse information *A*vailability of beds *S*torage of mandatory patient information *U*pdating patient information *N*ame of the physicians/Nurses with department/ patients to be affiliated, etc

SQL queries

(−) Write a query in SQL to find a nurse who is yet to be registered

select *from nurse where registered =’f’;

(−) Write a query in SQL to find the name of the nurse who are the head of their department:

select *from nurse where position=’Head Nurse’;

(−) Write a query in SQL to find the name of the physicians who are the head of each department

select p.name,d.name from physician p inner join department d on p.employeeid = d.head;

(−) Write a query in SQL to count the number of patients who taken appointment with at least one physician

select count(distinct(patient)) from appointment;

(−) Write a query in SQL to find the floor and block where the room number 212 belongs to

select blockfloor,blockcode,roomnumber from room where roomnumber=212;

(−) Write a query in SQL to count the number available rooms

select count(unavailable) from room where unavailable=’f’;

(−) Write a query in SQL to count the number of unavailable rooms

with avlbl as (select count(unavailable) from room where unavailable=’t’) select *from avlbl;

(−) Write a query in SQL to obtain the name of the physician and the departments they are affiliated with

select employeeid,department,p.name as physician_name,d.name as department_name from physician p inner join affiliated_with aw on p.employeeid = aw.physician inner join department d on aw.department = d.department_id where primaryaffiliation=’t’;

(−) Write a query in SQL to obtain the name of the physicians who are trained for a special treatment

select employeeid,name from physician where employeeid in (select distinct physician from trained_in);

(−) Write a query in SQL to obtain the name of the physicians who are trained for a special treatment using

select p.employeeid,p.name,pr.code,pr.name as name_of_procedure from physician p inner join trained_in ti on p.employeeid=ti.physician inner join procedures pr on ti.treatment=pr.code;

(−) Write a query in SQL to obtain the name of the physicians with department who are yet to be affiliated

select p.name,d.name from physician p inner join affiliated_with aw on p.employeeid = aw.physician inner join department d on aw.department = d.department_id where primaryaffiliation='f';

(−) Write a query in SQL to obtain the name of the physicians who are not a specialized physician

select name as not_specialized_physicians from physician where employeeid not in(select distinct physician from trained_in);

(−) Write a query in SQL to obtain the name of the patients with their physicians by whom they got their preliminary treatement

select p.name as patient_name,ph.name as phy_who_did_pri_treatment from patient p inner join physician ph on p.pcp = ph.employeeid;

(−) Write a query in SQL to find the name of the patients and the number of physicians they have taken appointment

select p.name as patient_name,count(distinct physician) as no_of_phy_tkn_apmnt_frm from patient p inner join appointment a on p.ssn = a.patient group by p.name;

(−) Write a query in SQL to count number of unique patients who got an appointment for examination room C.

select examinationroom,count(distinct patient) from appointment group by examinationroom having examinationroom='C';

(−) Write a query in SQL to find the name of the patients who taken the appointment on the 25th of April at 10 am, and also display their physician, assisting nurses and room no

select p.name as patient_name, ph.name as physician_name, n.name as nurse_name, a.examinationroom from patient p left outer join appointment a on p.ssn = a.patient left outer join physician ph on a.physician = ph.employeeid left outer join nurse n on a.prepnurse = n.employeeid where start_dt = '25_04_08';

(−) Write a query in SQL to find the name of the patients, their treating physicians and medication

select p.ssn,p.name as patient_name,ph.name as treating_phy_name,m.name as medicine_name from patient p inner join undergoes u on p.ssn = u.patient inner join prescribes pr on u.patient = pr.patient inner join medication m on pr.medication = m.code inner join physician ph on pr.physician = ph.employeeid;

(−) Write a query in SQL to find the name of the patients who taken an advanced appointment, and also display their physicians and medication

select p.ssn, p.name as patient_name, ph.name as physician_name, m.name as medicine_name from patient p left outer join appointment a on p.ssn = a.patient left outer join prescribes pr on a.patient = pr.patient left outer join physician ph on pr.physician = ph.employeeid left outer join medication m on pr.medication = m.code ;

Data Analysis Results

There was only employee, who was not yet register. The head of nurse is Carla Espinosa. There are three physicians who are the head of each department. There are four patients, who taken appointment with at least one physician. There are two the floors and blocks, where the room number 212 belongs to. There are twenty nine available rooms and seven unavailable rooms. There are nine physicians and the departments they are affiliated with. There are three physicians, who are trained for a special treatment. There are four patients with their physicians by whom they got their preliminary treatment. There are four patients and the number of physicians they have taken appointment. There are three unique patients who got an appointment for examination room C. There are two names of the patients, their treating physicians and medication. There are four names of the patients who taken an advanced appointment, and also display their physicians and medication.