Cairo University

Faculty Of Engineering

Computer Engineering Department

CMPN202

CHS-Team 7

Introduction to Database Systems

Hospital Database System

ER Diagram Report

Team 7

Team Members:

Omar Mohamed Ahmed Amin	1190204
Ahmed Mohamed Saad Hussien	1190184
Youssef Mohamed Mahmoud Mohamed	1190202
Nada Tarek Abdelraouf Mohamed	1180504

Contact Info:

Omar Amin:	oamin.omar@gmail.com
Ahmed Saad:	ahmed.moh.saad.hussein.ali@gmail.com
Nada Tarek:	nadatarek2710@gmail.com
Youssef Mohamed:	youssef.shaban01@eng-st.cu.edu.eg

5/11/2021

Problem Definition:

One of the most important yet neglected sectors is the medical sector, which suffers from a lot of inorganization. So, we decided to develop a database management system for hospitals which can also be applied to other healthcare related institutions.

Our project is a desktop application that provides 3 different views according to the user whether he is a doctor, receptionist, or an accountant. For each user there are plenty of functions designed to manage, manipulate, and analyze both patients' data and the hospital's assets. The application helps reserving appointments, requesting medical procedures, and controlling the rooms (bed or operating rooms) available in the hospital.

Users and Their Privileges:

1) Doctors
    a) Personal Functions
        i) Preview schedule.
        ii) Cancel appointments.
        iii) Postpone appointments.
    b) Patient Related Functions
        i) Show patients information.
        ii) Write a report.
        iii) Edit a report.
        iv) Add allergies, Blood type, etc...
        v) Request a surgery.
        vi) Request a scan (X-Ray, CBC, CT, etc.).
        vii) Add medicine/food note to patients in rooms.
        viii) Dismiss a patient.
        ix) Search for a patient.

Note: Can only access his patients' data but has no access over other patients or transactions data

2) Reception/Reservations Employee
    a) Add patients' info (Age, Name, Blood type, Allergies, etc.).
    b) Reserve beds.
    c) Reserve scans.
    d) Reserve surgeries.
    e) Reserve a checkup.
    f) Reserve a follow-up.
    g) Search for a patient.

    Note: can only see the doctors' requests but the approval is Financial Affairs Employee's responsibility

3) Financial Affairs Employee
    a) Approve requests.
    b) Postpone/Cancel a request.
    c) Add/Withdraw money from the system.
    d) Edit staff salaries.
    e) Edit staff members.
    f) Search for staff members.
4) Admin
    a) Add doctors to the system
    b) Add Nurses to the system
    c) Add Employees to the system
    d) Edit employee's data
    e) Add Users
    f) Edit Users
    g) Show Employees statistics

Entities and their Description:

1- Doctors: Doctors who are responsible for medical procedure in the Hospital

2- Nurses: Nurses who aids doctors and are responsible for rooms in the hospital

3- Patients: People who needs medical attention

4- Employees: All the staff in the hospital

5- Rooms: Rooms in which patients receive medical attention or have operations

6- Operations: Operation and procedures taking place

7- Transactions: Any deposited or withdrawn money in the system

8- Department: Medical departments in the hospital

9- Scan Labs: Where scans or tests required take place

10- Users: Includes login data of users to have different views

Lookup Tables:

1- Person: personal information of users or persons

2- User_type: look up for type of system user

3- Operation_type: look up table for types of operation

4- Employee_type: look up for types of employees

Relations:

1- Supervises: Relation between a doctor and his supervising doctor

2- Responsible_for: Relation between a room and the responsible Nurse

3- Staying_in: Relation between the patient and the room he's staying in

4- Is_located: Relation between the operation and the room it's taking place in

5- Operate: Relation that connects the Doctor, nurse, and patient with the operation on the patient

6- Responsible_dr: Relation between the patient and the doctor responsible for him

7- Works_in_dep: Relation that represents which department the employee works in

8- Manages: Relation between the departments and the doctor who manages it

9- Request: Relation between the doctor and the patient which represents the requests ordered by the doctor for a specific patient

10- Gets_paid: Relation between all employees and transaction which represents their salary

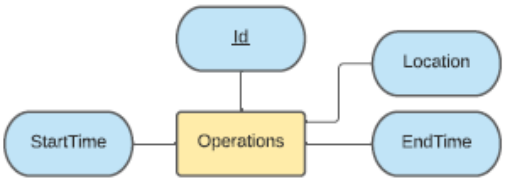
11- Appointments: Relation between the doctor and the patient which represents the appointments the patient has with a specific doctor

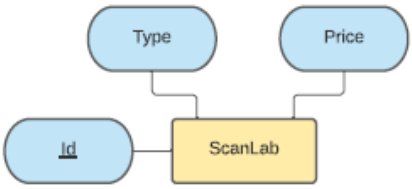
12- Has_a_Scan: Relation between the patient and the lab which represents the scans a patient has in the labs

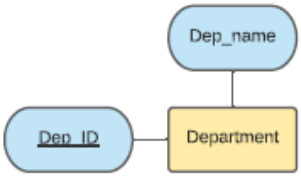
13- Is: Relation between employees, Drs, Patients, Nurses and person and a relation between person and user used for login data

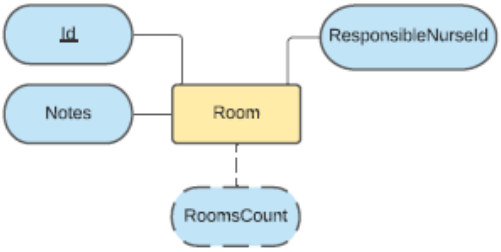
14- Has: Relation to represent the user type of each user

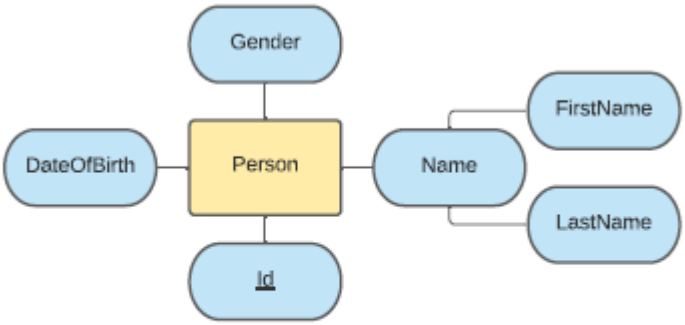
Entities and Attributes:

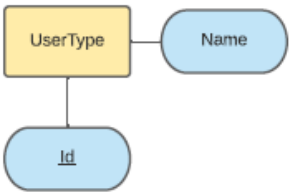


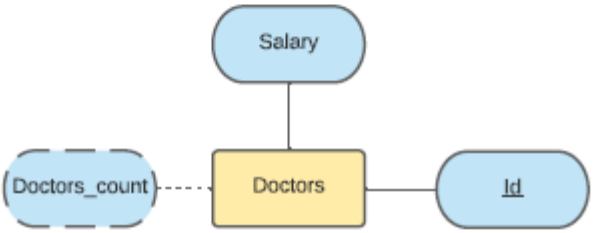


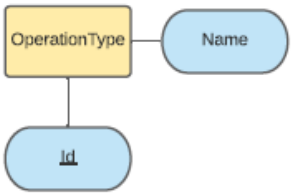


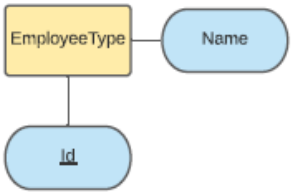


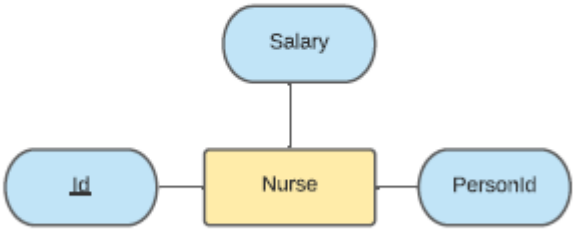


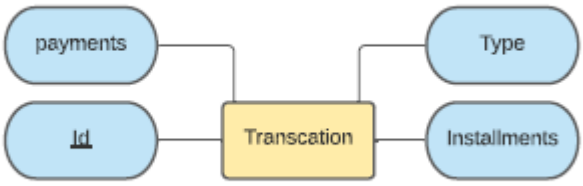


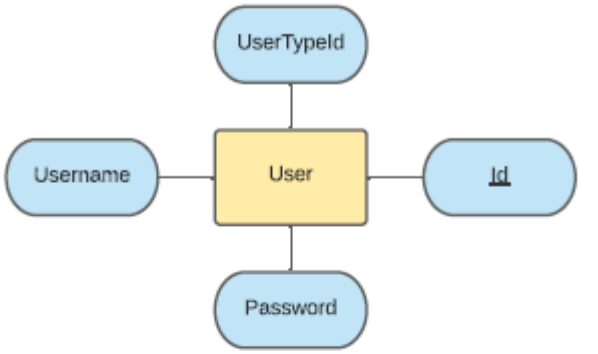


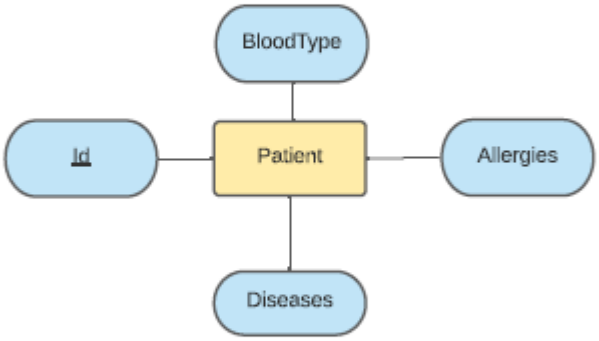


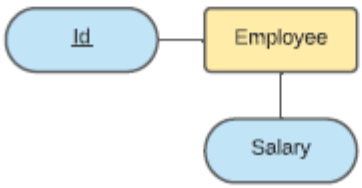




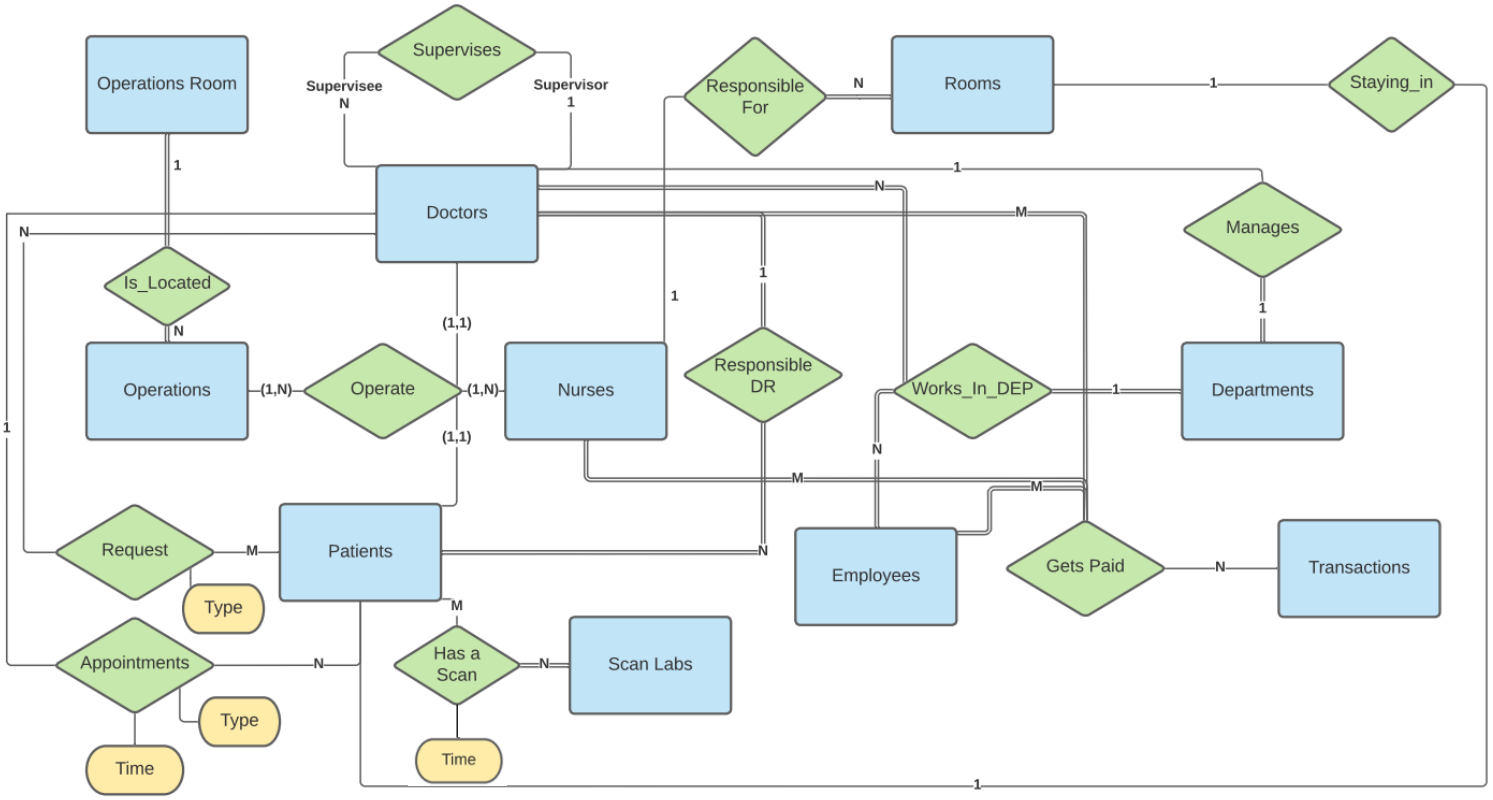

payments
Type
Id
Transcation
Installments

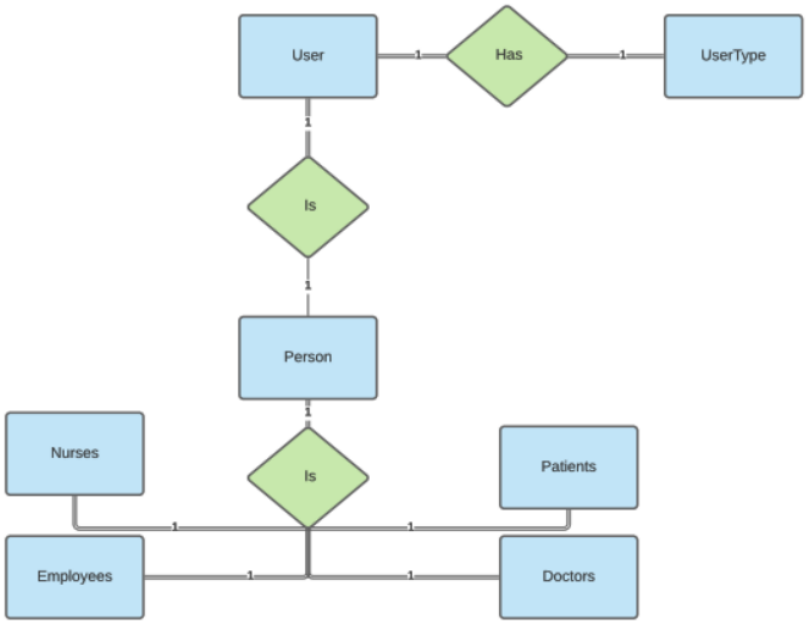

UserTypeId
Username
User
Id
Password


BloodType
Id
Patient
Allergies
Diseases

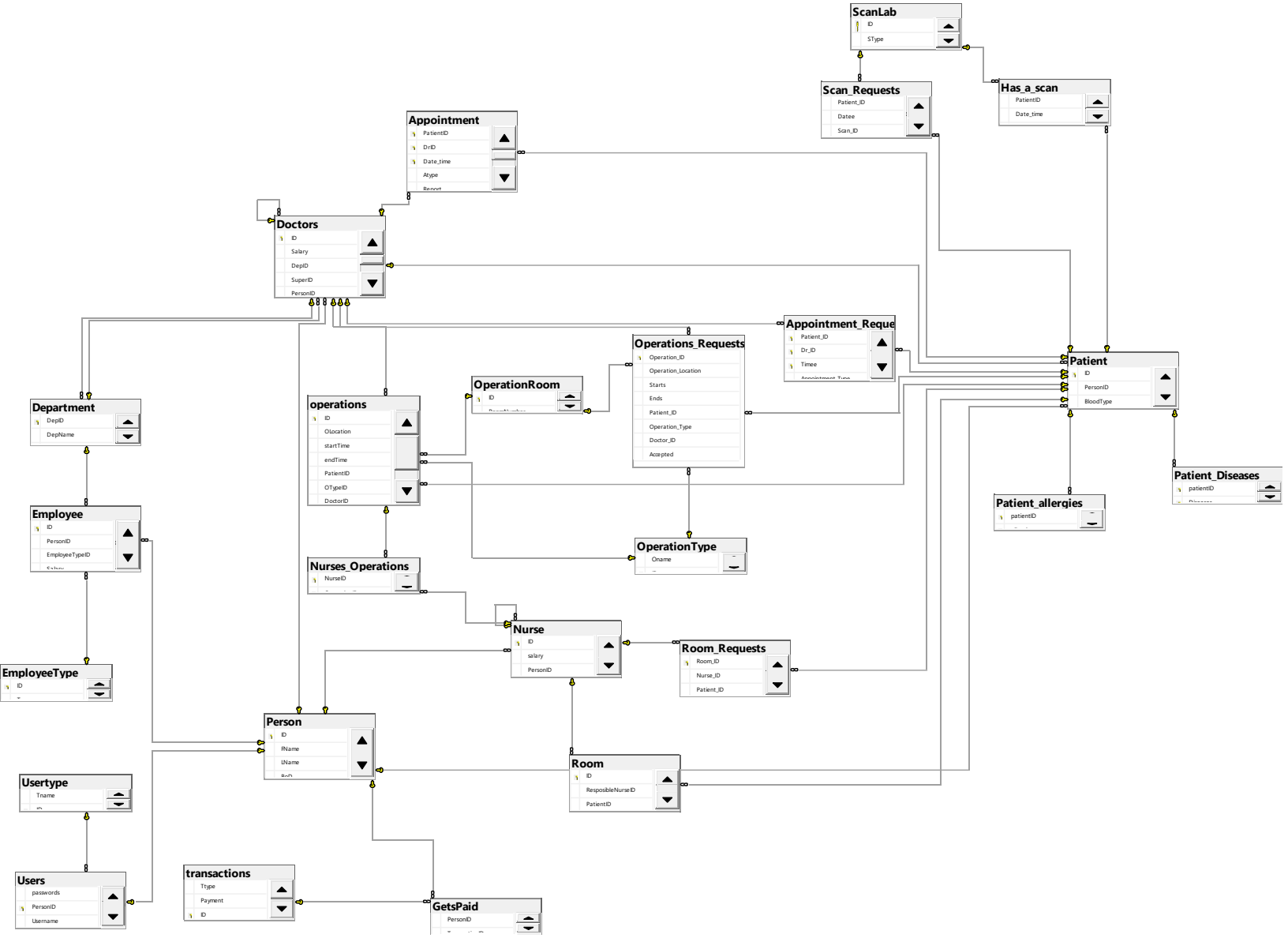

Id
Employee
Salary

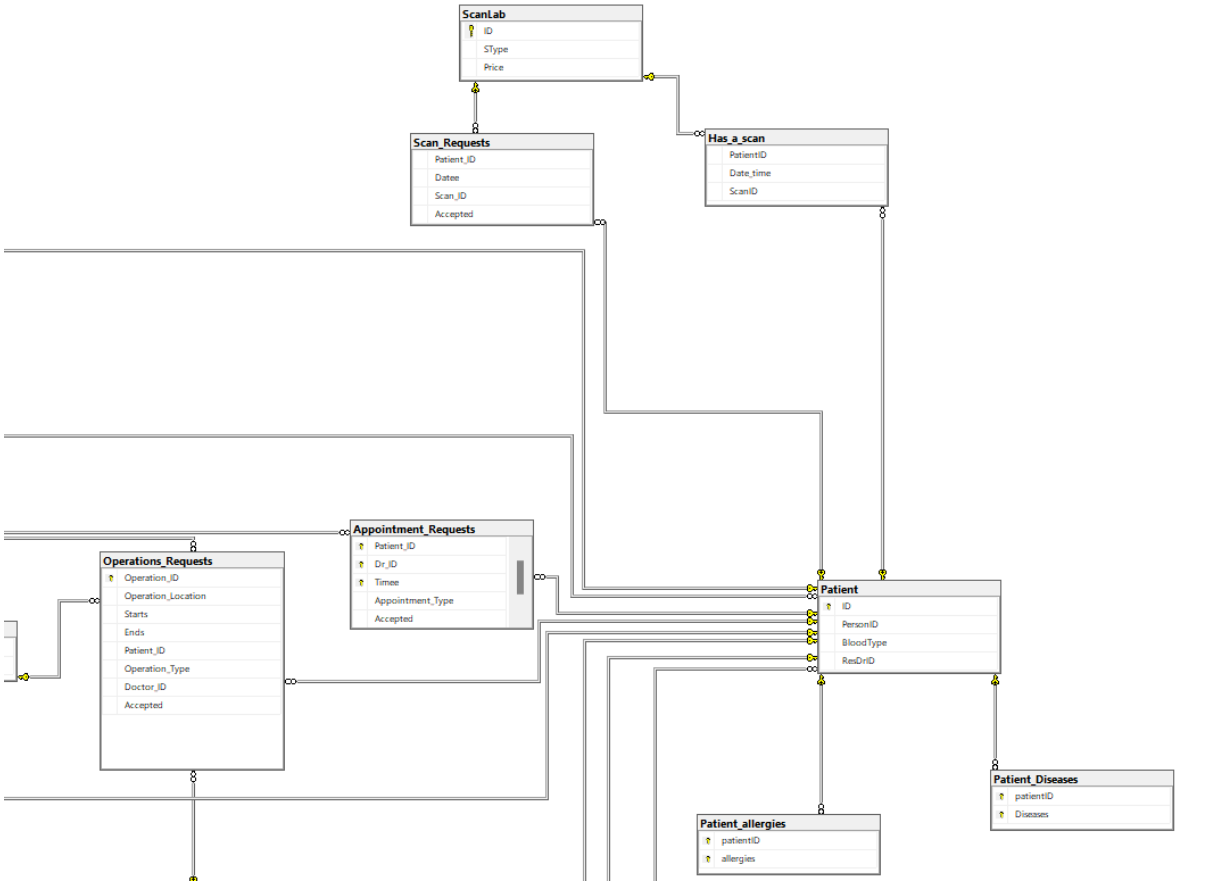
Entities and Relations:

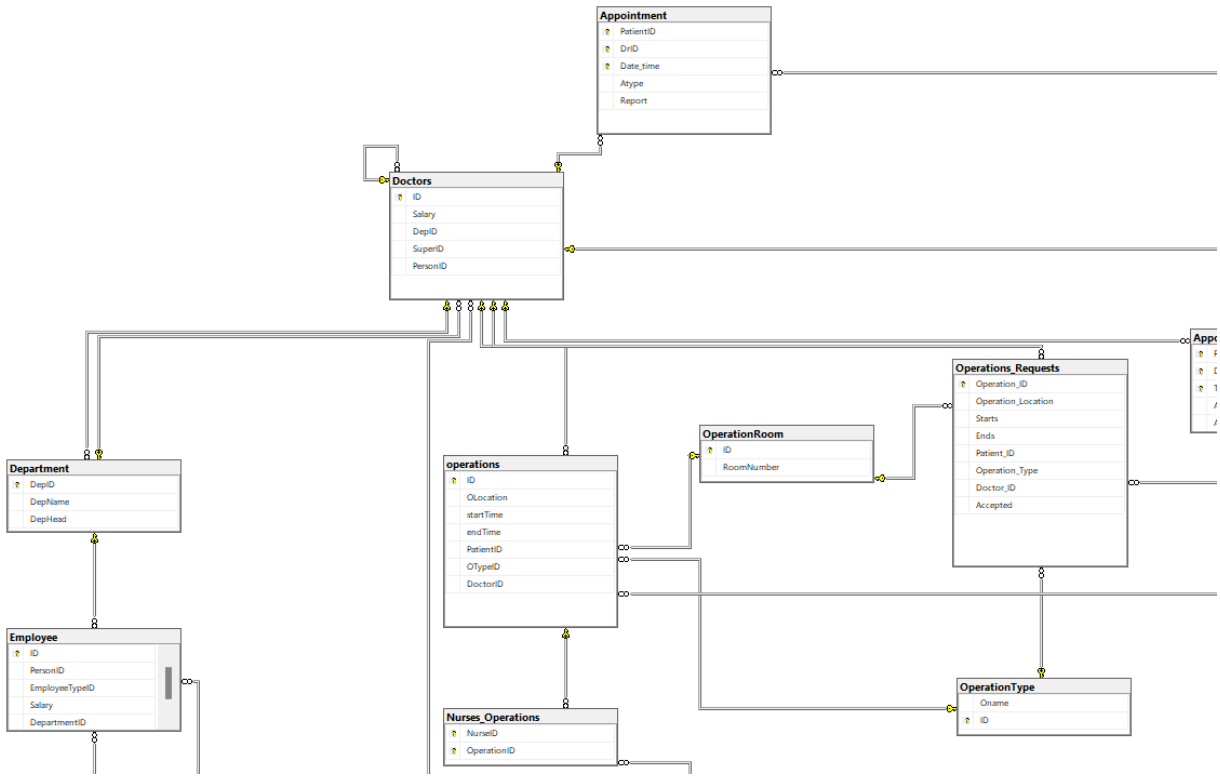


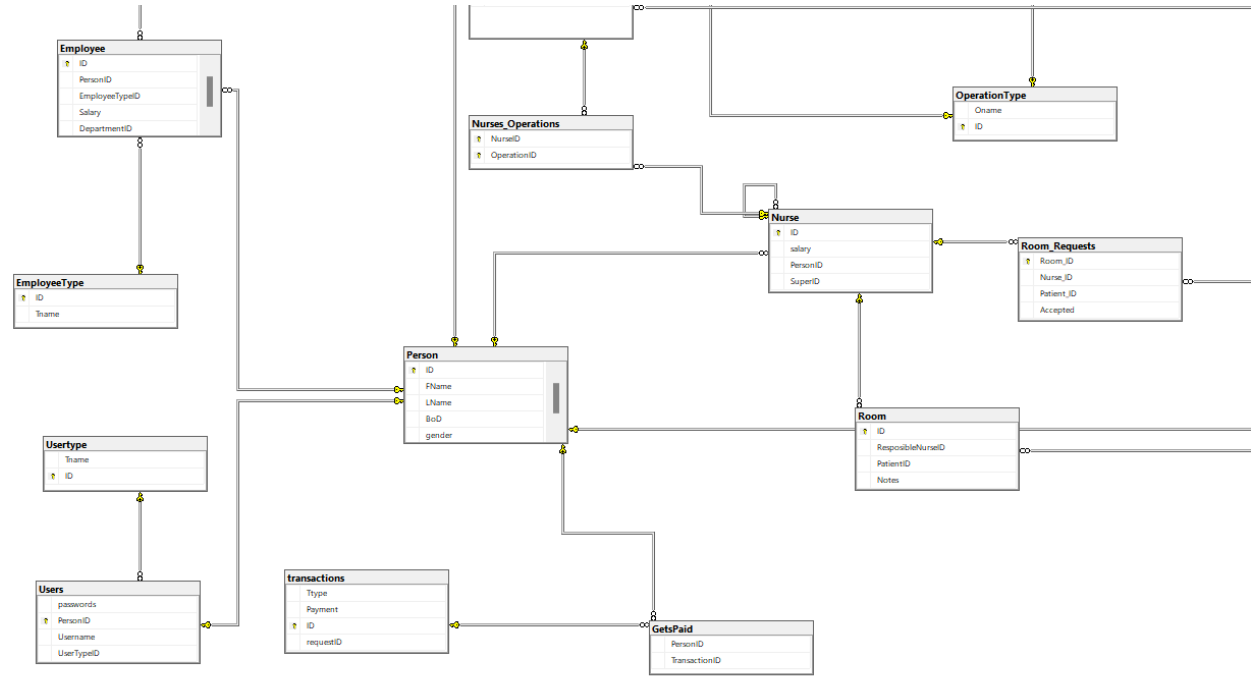


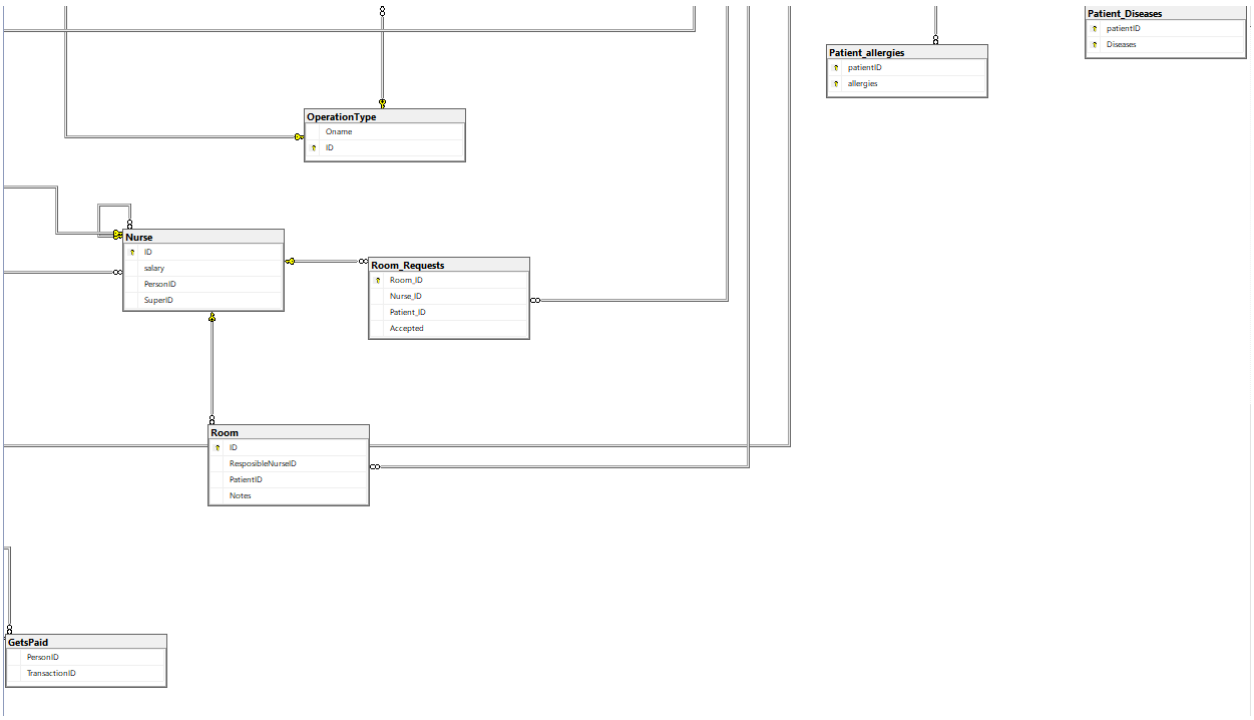
Schema:


ScanLab
ID
SType
Scan_Requests
Patient_ID
Datee
Scan_ID
Has_a_scan
PatientID
Date_time
Appointment
PatientID
DrID
Date_time
Atype
Report
Doctors
ID
Salary
DepID
SuperID
PersonID
Appointment_Reque
Patient_ID
Dr_ID
Timee
Operations_Requests
Operation_ID
Operation_Location
Starts
Ends
Patient_ID
Operation_Type
Doctor_ID
Accepted
Patient
ID
PersonID
BloodType
OperationRoom
ID
operations
ID
OLocation
startTime
endTime
PatientID
OTypeID
DoctorID
Department
DepID
DepName
Patient_Diseases
patientID
Patient_allergies
patientID
Employee
ID
PersonID
EmployeeTypeID
OperationType
Oname
Nurses_Operations
NurseID
Nurse
ID
salary
PersonID
Room_Requests
Room_ID
Nurse_ID
Patient_ID
EmployeeType
ID
Person
ID
FName
LName
Room
ID
ResposibleNurseID
PatientID
Usertype
Tname
Users
passwords
PersonID
Username
transactions
Ttype
Payment
ID
GetsPaid
PersonID


ScanLab
ID
SType
Price
Scan_Requests
Patient_ID
Datee
Scan_ID
Accepted
Has_a_scan
PatientID
Date_time
ScanID
Appointment_Requests
Patient_ID
Dr_ID
Timee
Appointment_Type
Accepted
Operations_Requests
Operation_ID
Operation_Location
Starts
Ends
Patient_ID
Operation_Type
Doctor_ID
Accepted
Patient
ID
PersonID
BloodType
ResDrID
Patient_Diseases
patientID
Diseases
Patient_allergies
patientID
allergies


Appointment
PatientID
DrID
Date_time
Atype
Report
Doctors
ID
Salary
DepID
SuperID
PersonID
Department
DepID
DepName
DepHead
Employee
ID
PersonID
EmployeeTypeID
Salary
DepartmentID
operations
ID
OLocation
startTime
endTime
PatientID
OTypeID
DoctorID
Nurses_Operations
NurseID
OperationID
OperationRoom
ID
RoomNumber
Operations_Requests
Operation_ID
Operation_Location
Starts
Ends
Patient_ID
Operation_Type
Doctor_ID
Accepted
OperationType
Oname
ID


Employee
ID
PersonID
EmployeeTypeID
Salary
DepartmentID
EmployeeType
ID
Tname
Nurses_Operations
NurseID
OperationID
OperationType
Oname
ID
Nurse
ID
salary
PersonID
SuperID
Room_Requests
Room_ID
Nurse_ID
Patient_ID
Accepted
Person
ID
FName
LName
BoD
gender
Room
ID
ResposibleNurseID
PatientID
Notes
Usertype
Tname
ID
Users
passwords
PersonID
Username
UserTypeID
transactions
Ttype
Payment
ID
requestID
GetsPaid
PersonID
TransactionID


Patient_allergies
patientID
allergies
Patient_Diseases
patientID
Diseases
OperationType
Oname
ID
Nurse
ID
salary
PersonID
SuperID
Room_Requests
Room_ID
Nurse_ID
Patient_ID
Accepted
Room
ID
ResposibleNurseID
PatientID
Notes
GetsPaid
PersonID
TransactionID

Assumptions:

- No doctor can perform 2 operations at the same time
- An operation can have more than 1 nurse but only one main doctor
- A doctor can have more than one patient
- Each department has only one manager
- A doctor can only be a manager of one department
- Each doctor has a supervising doctor
- Each room has only 1 supervising nurse
- Each room has only 1 patient
- Each User is a person but not all persons are users