Cairo University
Faculty of Engineering
Computer Engineering Department
CMPN202 (or CMP2020 for semester)

SEM - team 19

Introduction to Database Systems
Hospital System
Proposal phase
Team Number: 19

Team Members:

Kareem Ashraf Mohammed Ali	Sec: 2	B.N: 8
Shredan Abd-Allah Kamal	Sec: 1	B.N: 33
Omar Khalid Ali Mohammed	Sec: 2	B.N: 4
Nada Osman Abdalaziz	Sec: 2	B.N: 28

Contact info:
Kareem → kemokhalifa5@gmail.com
Nada → nadaosman20022002@gmail.com
Omar → omarkh200165@gmail.com
Sheridan → shredanabdullah@gmail.com

<**11/5/2021**>

The entities of the project:

1- Doctors

2- Patients

3- Nurses

4- Stuff

5- Manager

6- Clinic

7- Medicine

8- Emergency room

9- Operation room

10- Rooms

11- Equipment

12- Financial

13- Laboratories

14- Test

15- department

Users of the project:

1) Receptionist
2) Doctors
3) Manager
4) Nurses

Functionalities:

1- receptionist:

- ✓ Reserve a doctor (patient)
- ✓ Reserve medical tests (patient)
- ✓ Reserve an emergency doctor (patient)

- ✓ reserve a checkup (patient)
- ✓ reserve a vaccine (patient)
- ✓ Ask a feedback (patient)
- ✓ Reserve a ray (patient)
- ✓ Give the patient his report
- ✓ Print the receipt for the patient

2- doctor:

- ✓ Organize and show up his schedule
- ✓ View his monthly report and his raise
- ✓ Proof his attendance
- ✓ Reserve overtime
- ✓ Set complains
- ✓ Write patient report

3- manager:

- ✓ Hire doctors and nurses
- ✓ Set raises for both doctors and nurses
- ✓ Receive complains from patients
- ✓ Receive complains from doctors and nurses
- ✓ Approve requests
- ✓ Rate doctors and nurses (make a report for both)

4- nurses:

- ✓ Organize their schedule
- ✓ View his monthly report and his raise
- ✓ Proof his attendance
- ✓ Reserve overtime
- ✓ Set complains

Main idea:

Our project serves part of the clinical system which includes patients, doctors, managers, nurses. Where everything will be recorded, the available doctors and their schedule, the available operations rooms, labs and pharmacy stuff in order to facilitate the reservation process for the patients. Also, for doctors and nurses their schedule, reports, complaints, attendance to facilitate the work process. Also for managers and their reports, permissions, following up with the clinical supplies, with the stuff salaries and all about the hospital system. Also, we consider a well relationships between hospital components and a methodical distribution of Real- Hospital Entities.

Cairo University
Faculty of Engineering
Computer Engineering Department
CMPN202 (or CMP2020 for semester)

SEM - team 19

Introduction to Database Systems
Hospital System
Design phase
Team Number: 19

Team Members:

Kareem Ashraf Mohammed Ali	Sec: 2	B.N: 8
Shredan Abd-Allah Kamal	Sec: 1	B.N: 33
Omar Khalid Ali Mohammed	Sec: 2	B.N: 4
Nada Osman Abdalaziz	Sec: 2	B.N: 28

Contact info:
Kareem → kemokhalifa5@gmail.com
Nada → nadaosman20022002@gmail.com
Omar → omarkh200165@gmail.com
Sheridan → shredanabdullah@gmail.com

<**11/28/2021**>

Problem definition

Our hospital database system is used to make everything in the hospital well-organized and proper to save starting from well inserting of the patient data and reservation to inserting all data related to doctors who work in the hospital, managers of departments, equipment, stuff who work also in the hospital, and all rooms and departments of the hospital.
This organization of data allows us to solve the problem of mess in hospitals and gives us a well-organized system for the hospital

Privileges

1- **Doctor:**

The doctor in the hospital database system can access the following:

- Be able to write their schedule in the database and their attendance
- Be able to access patient appointments and write a report for the patient in the database
- Be able to write reports about nurses
- Be able to access the existed equipment and also to see the tests of patients
- Have the ability to access all medicines in the hospital

2- Nurses:

Nurses can access the following in the hospital database system:

- Be able to see the doctors they will work with
- Be able to write reports in the database to make the manager see them
- Have the ability to access medicine and to see patients' appointments

Have the ability to access and write down the tests of the patients

3-Receptionist user:

- Entity Access for Retrieving:

Doctors, Patients, Nurses, Clinic, Emergency room،Operation room, Rooms, Medicine, Financial part, Test, Department.

- Entity Access for Modification:

Patients, Clinic, Emergency room, Operation room, Rooms, Financial part.

4-Manager user:

- Entity Access for Retrieving:

Doctors, Patients, Nurses, Stuff, Manager, Clinic, Emergency room, Operation room, Rooms, Financial part, Test, Department, Equipment, laboratory, department.

- Entity Access for Modification:

Doctors, Patients, Nurses, Stuff, Manager, Clinic, Emergency room, Operation room, Rooms, Financial part, Test, Department, Equipment, laboratory, department.

The description of entities

1- **Doctor**:

This entity represents the doctors and all the information related to them like their names, phone, work time, IDs, specialization and so on. And the doctor's job in the hospital is to treat the patients and do operations normal and emergency and can do tests in laboratories and check patient treatment and their health in rooms

2- **Nurses**:

in this entity we have nurses' different information. Names, IDs, address, working time, salary, and other basic information. The nurse's role in the hospital is to help both doctors and patients.

3- **Patient**:

for this entity we must know all the information about the patients such as their ages, names, addresses, blood type, phones, disease, and the appointment (arrival time). The patient can ask for many things like: reserving a doctor or medical tests, make a checkup, take a vaccine and other regular reservation. Or receiving a room or an emergency room or an operation.

4- **manager**:

The managers are responsible for each department of the hospital. For example, one is responsible for financial other for clinics and also one for the whole hospital and so on. The information we collect about managers are names, IDs, SSN, phone ... etc.

5- **Clinics:**

We have different clinics in our hospital each one is for different specialization of medicine like eyes, nose, brain … etc.

For each clinic we need to know IDs, names, equipment, max number of doctors, cleaning stuff, nurses and so on.

The appointments between doctor and patient in the clinics.

6- **Department**:

We make a department for each different type of grouped places like labs, rays' section, clinics, emergency.

It manage relationships with different entitiesit consists of clinics and rooms and operation rooms and laboratories and emergency room and financial part

And all employees working in it.

Data to be collected are IDs, names, description

7- **Emergency Room**:

If any patient needs to do urgent operation, test or reservation we take them directly to emergency.

We need to know emergency ID, doctor, tools, nurses and so on.

8- **Stuff**:

the job of the stuff is different one group of the stuff is responsible for cleaning and other for checking the equipment also other group for guarding and security of the hospital

Of course, we must know about stuff member some information like name, ID, address, specialization, and other needed data.

9- **Financial**:

All money that patient pays for different things and also the money paid for doctors, nurses and stuff must be saved in the financial.

All we need to know about the financial is in budget and out budget.

10- **Tests**:

This one is the type of test which the patient will do in the hospital like Medical tests and X-rays.

And each test has its price, category, name, ID, and medicine.

11- **Operation rooms**:

It refers to the operations which are done by doctors for patients such as open-heart surgery, eyes surgeries and so on.

We need to know the doctor who will do the operation and whether he is available or not and also need to know the ID of the operation, name, price, and other data related.

12- **Rooms**:

The room are for patients to rest in while the duration of treatment. There are different classes of rooms for patients based on price of each room and each room has its unique ID, price, description, and maximum number of beds.

13- **Medicine**:

While the patients are being treated in the hospital, they will take their medicine from the hospital and pay its price in the end of treatment duration.

For medicine we have a place to save several and different types of medicine and each medicine has its category, ID, price, and name.

14- **Laboratories**:

Here we different types of tests for patients like blood test and pee tests.

For each lab we have to know its name and ID.

15- **equipment**:

Tools refer to all medicine equipment including doctor's tools and big machines used in diagnosis and checkups.

The data for tools are name, ID, duration of checkups and repairing, price, and stuff who are responsible for them.

The description of relationships

Manages: it's a relationship between MANAGER and DEPARTMENT and mean that exactly 1 manger Manages exactly 1 department, and store start date of managing.

Works For: it's a relationship between DOCTOR and DEPARTMENT and mean that at least 1 doctor Works For exactly 1 department.

Works For: it's a relationship between NURSE and DEPARTMENT and mean that at least 1 nurse Works For at least 1 department.

Works For: it's a relationship between STAFF and DEPARTMENT and mean that at least 1 staff Works For exactly 1 department.

Appointment: it's a relationship between PATIENT and DOCTOR, and mean that at least 1 patient have an Appointment with at least 1 doctor, and store patient's feedback on doctor and doctor report about patient and reserving time and date.

Helps: it's a relationship between NURSE and DOCTOR, and mean that at least 1 nurse Helps exactly 1 doctor, and store nurse's complaint on doctor and doctor's complaint on nurse.

Consists of: it's a relationship between CLINIC and DEPARTMENT, and mean that for any exactly 1 department consists of at least 1 clinic.

Consists of: it's a relationship between ROOM and DEPARTMENT, and mean that for any exactly 1 department consists of at least 1 room.

Consists of: it's a relationship between OPERATION ROOM and DEPARTMENT, and mean that for any exactly 1 department consists of at least 1 operation room.

Consists of: it's a relationship between EMERGENCY ROOM and DEPARTMENT, and mean that for at least 1 department consists of at most 1 emergency room.

Consists of: it's a relationship between LABORATORY and DEPARTMENT, and mean that for at least 1 department Consists of at most 1 laboratory.

Consists of: it's a relationship between FINANCIAL PART and DEPARTMENT, and mean that for any exactly 1 department Consists of exactly 1 financial part.

Reserve: it's a relationship between ROOM and PATIENT, and mean that for at least 1 patient or no one can reserve at most 1 room.

Reserve: it's a relationship between OPERATION ROOM and PATIENT, and mean that for at least 1 patient or no one can reserve at most 1 operation room.

Reserve: it's a relationship between EMERGENCY ROOM and PATIENT, and mean that for at least 1 patient or no one can reserve at most 1 emergency room.

Have: it's a relationship between EMERGENCY ROOM and TOOL, and mean that for at least 1 emergency room has at least 1 tool, also it's not necessary for a tool to exist in emergency room.

Have: it's a relationship between OPERATION ROOM and TOOL, and mean that for at least 1 operation room has at least 1 tool, also it's not necessary for a tool to exist in operation room.

Have: it's a relationship between ROOM and TOOL, and mean that for at least 1 room has at least 1 tool, also it's not necessary for a tool to exist in room.

Have: it's a relationship between CLINIC and TOOL, and mean that for at least 1 clinic has at least 1 tool, also it's not necessary for a tool to exist in clinic.

Have: it's a relationship between LABORATORY and TOOL, and mean that for at least 1 laboratory has at least 1 tool, also it's not necessary for a tool to exist in laboratory.

Have: it's a relationship between CLINIC and MEDICINE, and mean that for at least 1 clinic has at least 1 medicine, also it's not necessary for a medicine to exist in clinic.

Have: it's a relationship between ROOM and MEDICINE, and mean that for at least 1 room has at least 1 medicine, also it's not necessary for a medicine to exist in room.

Have: it's a relationship between ROOM and MEDICINE, and mean that for at least 1 room has at least 1 medicine, also it's not necessary for a medicine to exist in room.

Have: it's a relationship between LABORATORY and TOOL, and mean that for exactly 1 laboratory has at least 1 test.

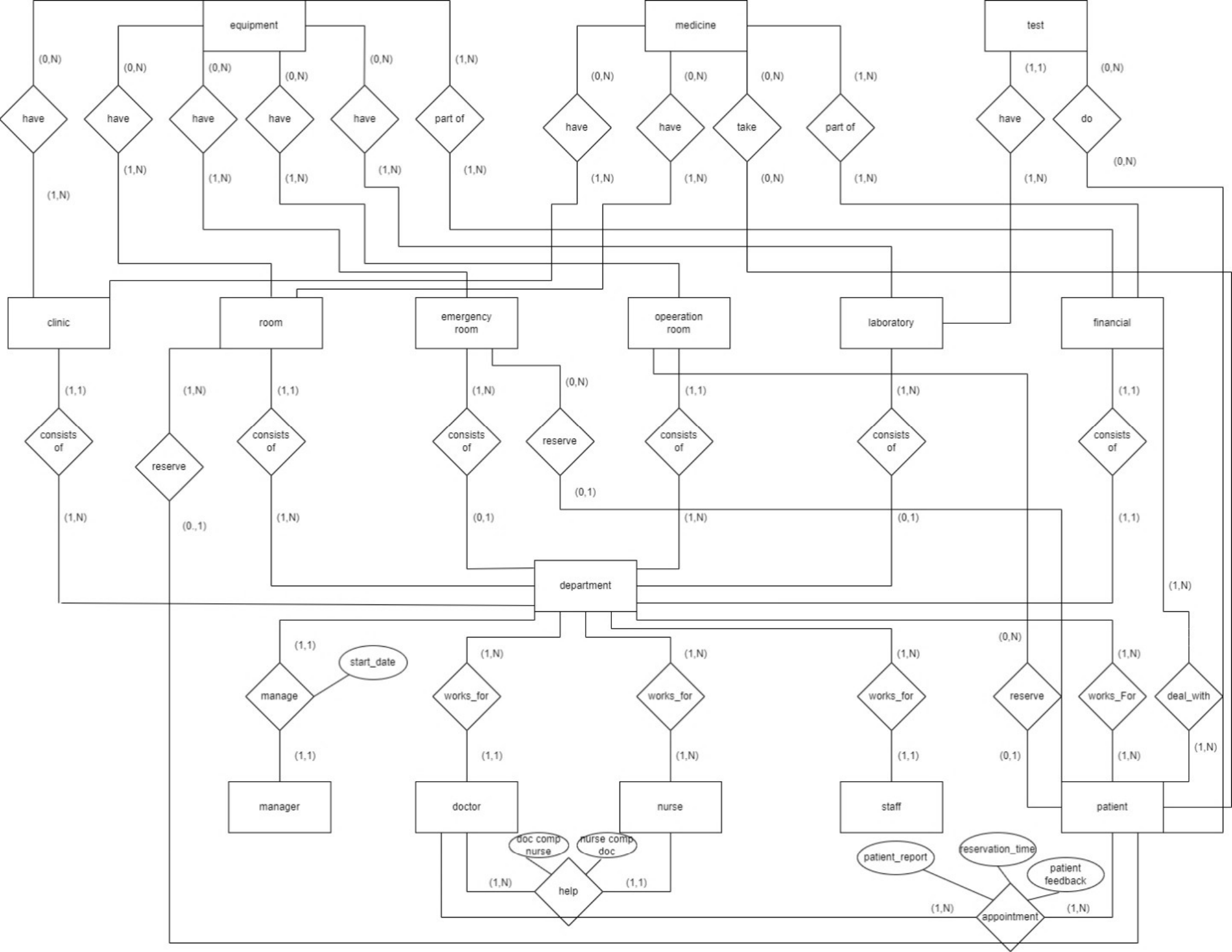
Take: it's a relationship between PATIENT and MEDICINE, and mean that for at least 1 patient has at least 1 medicine, also it's not necessary for a medicine to be taken from any patient, also it's not necessary for patient to take any medicine.

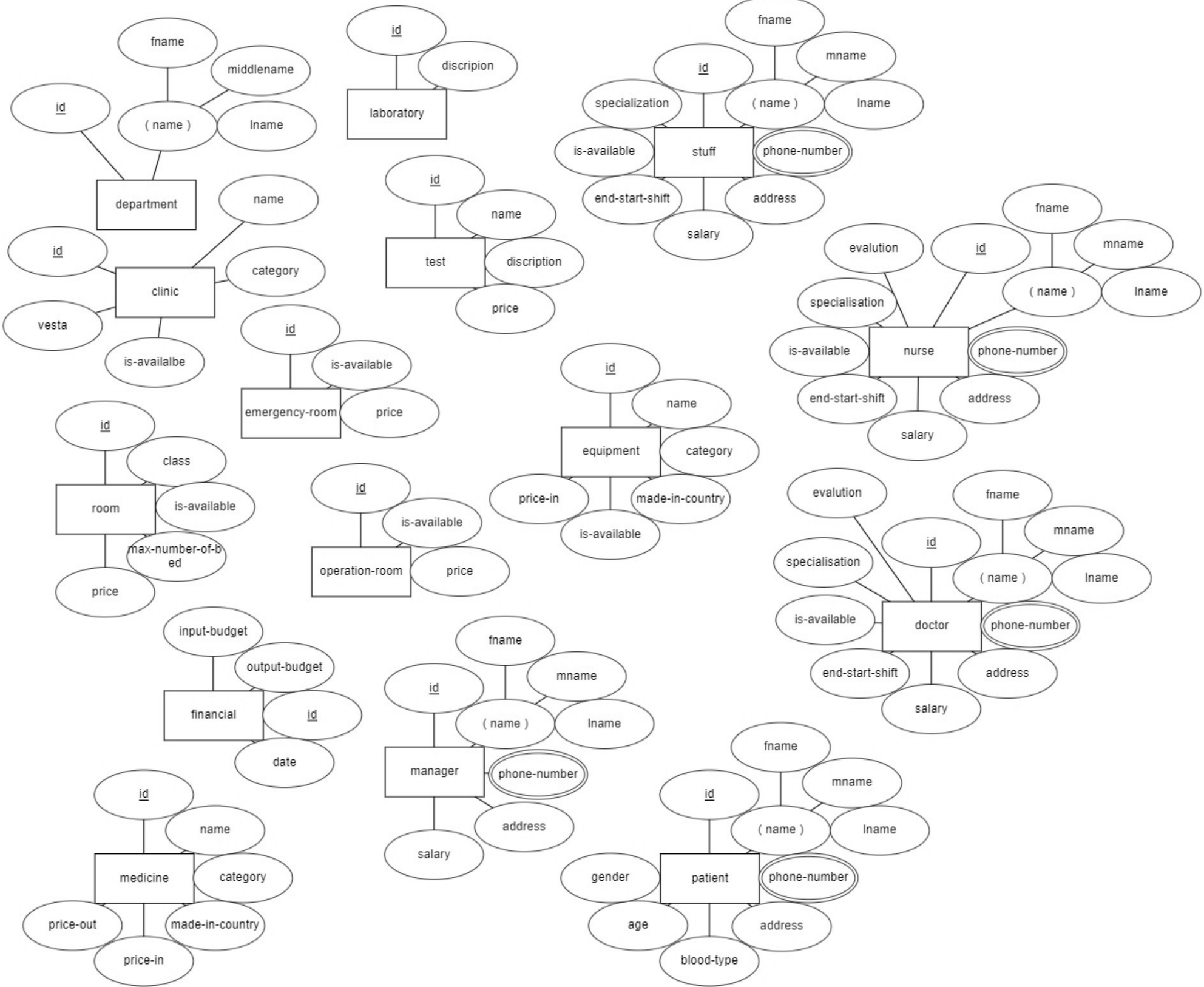
Do: it's a relationship between PATIENT and TEST, and mean that for at least 1 patient has at least 1 test, also it's not necessary for a test to be done to any patient, also it's not necessary for patient to do any test.

Part of: it's a relationship between FINANCIAL PART and TOOL, and mean that for at least 1 tool is part of at least 1 financial part.

Part of: it's a relationship between FINANCIAL PART and MEDICINE, and mean that for at least 1 medicine is part of at least 1 financial part.

Deal with: it's a relationship between PATIENT and FINANCIAL PART and mean that at least 1 patient deal with at least 1 financial part.


equipment
medicine
test
have
have
have
have
have
part of
have
have
take
part of
have
do
clinic
room
emergency room
opeeration room
laboratory
financial
consists of
reserve
consists of
consists of
reserve
consists of
consists of
consists of
department
manage
start_date
works_for
works_for
works_for
reserve
works_For
deal_with
manager
doctor
nurse
staff
patient
help
doc comp nurse
nurse comp doc
patient_report
reservation_time
patient feedback
appointment


fname
middlename
id
(name)
lname
department
id
discripion
laboratory
fname
mname
id
specialization
(name)
lname
is-available
stuff
phone-number
end-start-shift
address
salary
id
name
test
discription
price
name
id
category
clinic
vesta
is-availalbe
id
is-available
emergency-room
price
fname
evalution
id
mname
(name)
specialisation
lname
is-available
nurse
phone-number
end-start-shift
address
salary
id
name
equipment
category
price-in
made-in-country
is-available
id
class
room
is-available
max-number-of-b
ed
price
id
is-available
operation-room
price
evalution
fname
id
mname
specialisation
(name)
lname
is-available
doctor
phone-number
end-start-shift
address
salary
input-budget
output-budget
financial
id
date
fname
mname
id
(name)
lname
manager
phone-number
address
salary
id
name
medicine
category
price-out
made-in-country
price-in
fname
mname
id
(name)
lname
gender
patient
phone-number
age
address
blood-type