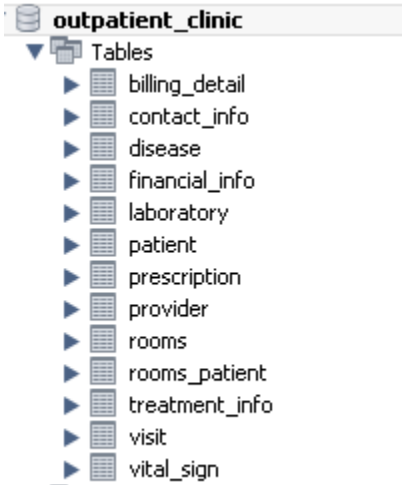
Outpatient Clinic Database System Design

• What is the database about?

This database's main purpose is to support store and retrieve patient information details such as patient demographic information, provider information, the visit information of the patient, patient health history details, the clinical care information, the list of room information, and the billing detail of each patient.

• Tables are in BCNF form

Structure of database



There are some information object could be stored in this database, including:

1. Patient information
    a. For each patient, we keep track of a unique patient identifier, patient date of birth, gender, patient name (first name, middle initial and last name), age, marital status, language.

Table: patient

Columns:

patient_id	int AI PK
first_name	varchar(45)
middle_name	varchar(45)
last_name	varchar(45)
date_of_birth	date
age	int
language	varchar(45)
marital_status	varchar(45)
gender	varchar(45)
provider_id	int PK

b. Patient Financial Information: as follows Employment Information, insurance information, and responsible party.

Table: financial_info

Columns:

patient_id	int PK
insurrance_info	varchar(100)
responsible_party	varchar(100)

c. Patient contact information. Address (including, zip code and state, cell phone, email)

Table: contact_info

Columns:

patient_id	int PK
address	varchar(45)
state	varchar(45)
zip_code	varchar(45)
email	varchar(45)
phone_number	varchar(45)

2. Provider information

first name, middle initial and last name, specialist, gender, age, graduation date from med. School, year of practice, language, date of hire, provider Id, federal Id) Visit (Patient Care)

Table: provider

Columns:

provider_id	int AI PK
first_name	varchar(45)
middle_name	varchar(45)
last_name	varchar(45)
date_of_birth	date
age	int
specialist	varchar(45)
gender	varchar(45)
language	varchar(45)
date_of_hire	date
grad_date	date
year_of_practice	int
school	varchar(45)
federal_id	varchar(45)

3. Patient Visit Information.

Visit requires an encounter_ID (encounterID,datetime, patientID,providerID)

Table: visit

Columns:

encounter_id	int PK
patient_id	int PK
date_time_of_visit	date

During the visit, the following could be a record

•Vital Sign: weight, height, blood pressure, temperature, oxygen Level, heartbeats

Table: vital_sign

Columns:

patient_id	int PK
temperature	float
blood_pressure	varchar(45)
height	float
weight	float
heart_beats	int
oxygen_level	int

•Treatment (ICD10, medication)

Table: treatment_info

Columns:

patient_id	int PK
icd10	varchar(45)
medication	varchar(45)

•Laboratory Testing (date, type, results)

Table: laboratory

Columns:

patient_id	int PK
type	varchar(45)
results	varchar(100)
date	date

•Diseases (diseaseName, ICD-10, diseaseType)

Table: disease

Columns:

patient_id	int PK
icd10	varchar(45)
disease_name	varchar(45)
disease_type	varchar(45)

•Prescription (date, patientId, providerId)

Table: prescription

Columns:

patient_id	int PK
provider_id	int PK
date	date

4. Billing details information

   This table contains information about bill payment, such as test fees, consulting fees, medicine price.

Table: billing_detail

Columns:

bill_id	int AI PK
patient_id	int PK
consulting_fees	float
test_fees	float
medicine_price	float
other_charges	float
total_amount	double
date	date

5. The list of rooms

   The room table has information such as room id, type of room, price per date, availability

Table: rooms

Columns:

room_id	int AI PK
type	varchar(45)
price_per_date	int
availability	tinyint

6. The relationship between room and patient

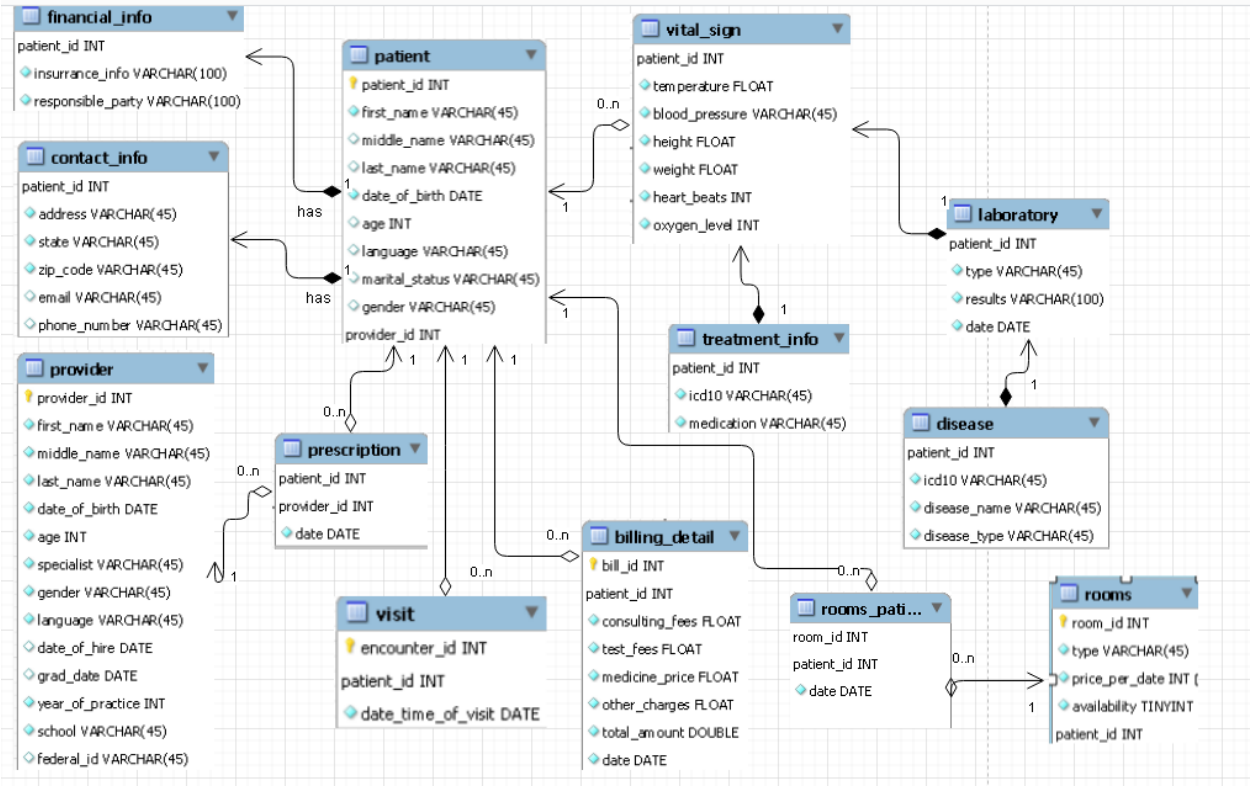
   It contains the room id, patient id and date.

Table: rooms_patient

Columns:

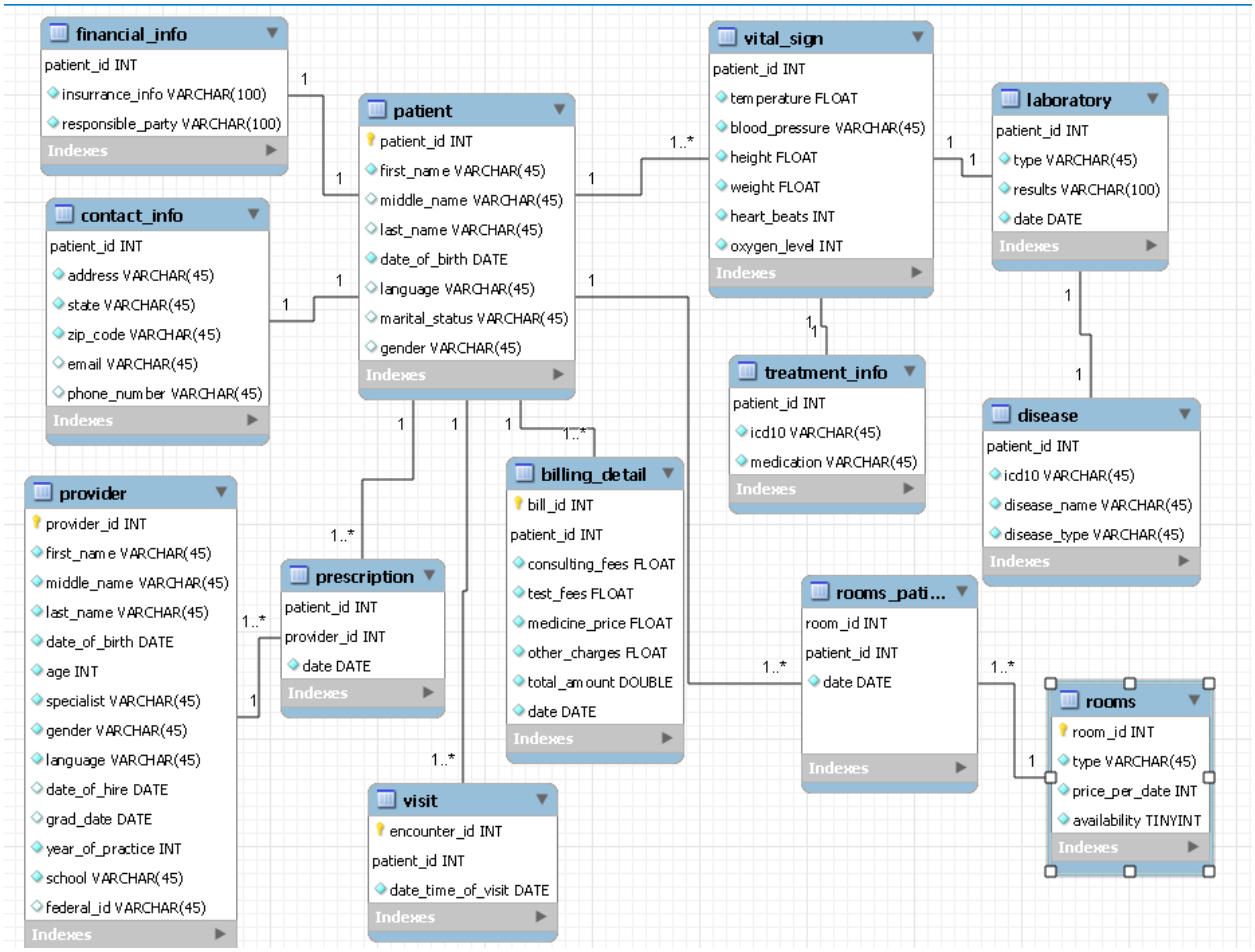
room_id	int PK
patient_id	int PK
date	date

• UML data model



This image shows the list of UML objects on this database. For example, the patient object has financial information, contact information. The patient could visit the clinic many times. The patient could set an appointment with the provider. The patient could rent a room, and so on.

- **ER diagram**



Based on the UML data modelling, I design the entity-relationship diagram like the image on the screen. There are some types of relationships such as one to many or one to one. They reflected on this diagram.