CIS 552

Conceptual Database Design

Team members:

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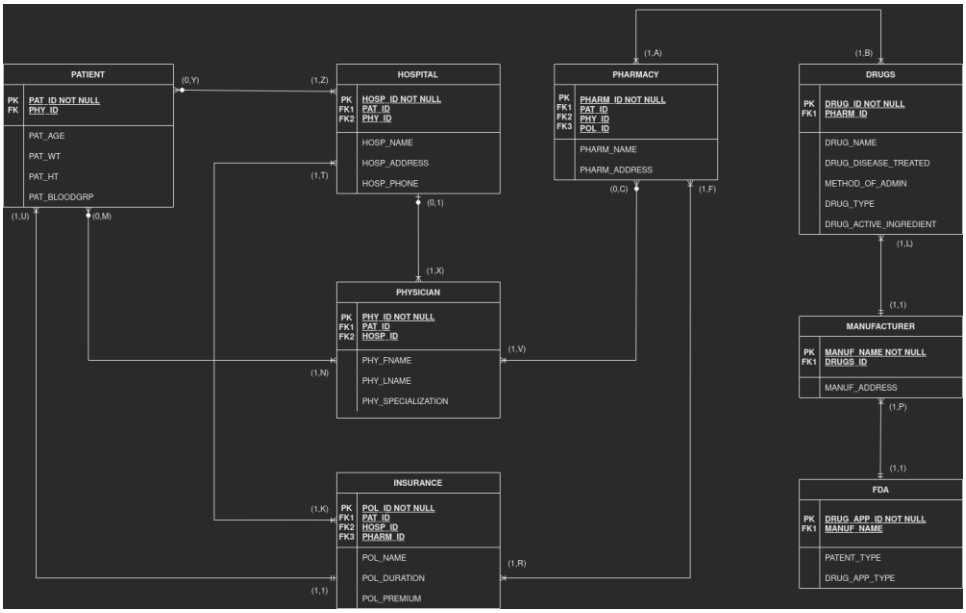
ERD Before Normalization:



Functional Dependencies:

Patient:

PAT_ID -> (PAT_AGE, PAT_WT, PAT_HT, PAT_BLOODGRP)

Physician:

PHY_ID -> (PHY_FNAME, PHY_LNAME, PHY_SPECIALIZATION)

Hospital:

HOSP_ID -> (HOSP_NAME, HOSP_ADDRESS, HOSP_PHONE)

Insurance:

POL_ID -> (POL_NAME, POL_DURATION, POL_PREMIUM)

Pharmacy:

PHARM_ID -> (PHARM_NAME, PHARM_ADDRESS)

Drug:

DRUG_ID -> (DRUG_NAME, DRUG_DISEASE_TREATED, METHOD_OF_ADMIN, DRUG_TYPE, DRUG_ACTIVE_INGREDIENT)

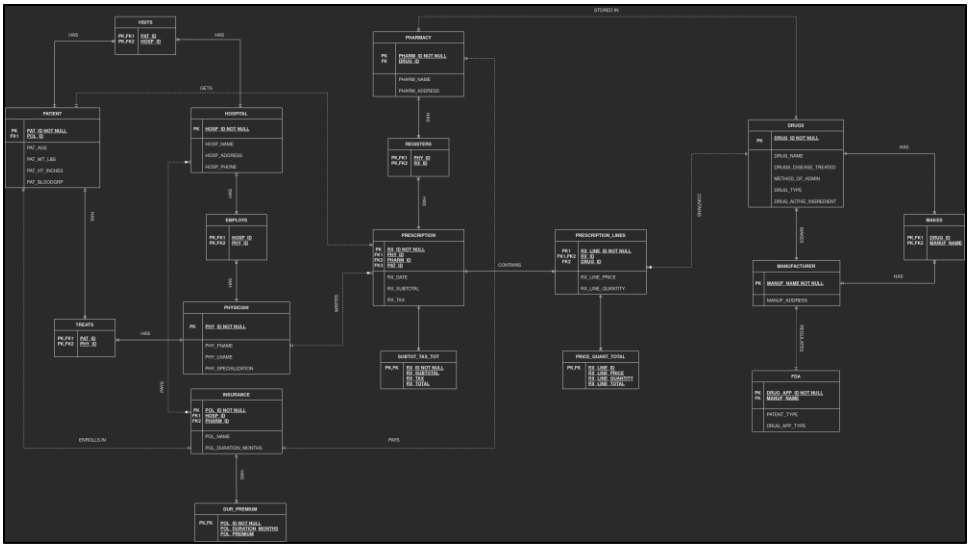
Manufacturer:

MANUF_ID -> (MANUF_ADDRESS)

FDA:

FDA -> (PATENT_TYPE, DRUG_APP_TYPE)

After Normalization:



Updated Entities:

1. PATIENT
2. PHYSICIAN
3. HOSPITAL
4. INSURANCE
5. PHARMACY
6. PRESCRIPTION
7. PRESCRIPTION_LINES
8. DRUG
9. MANUFACTURER
10. REGULATORY AUTHORITY

Database Schema:

Table	Column	Type
DRUGS	DRUG_ACTIVE_IN...	varchar(10)
DRUGS	DRUG_ID	int
DRUGS	DRUG_NAME	varchar(15)
DRUGS	DRUG_TYPE	varchar(10)
DRUGS	DRUGS_DISEASE_...	varchar(15)
DRUGS	METHOD_OF_AD...	varchar(10)
DUR_PREMIUM	POL_DURATION_...	int
DUR_PREMIUM	POL_ID	int
DUR_PREMIUM	POL_PREMIUM	float
EMPLOYS	HOSP_ID	int
EMPLOYS	PHY_ID	int
FDA	DRUG_APP_ID	int
FDA	DRUG_APP_TYPE	varchar(20)
FDA	MANUF_NAME	varchar(20)
FDA	PATENT_TYPE	varchar(20)
HOSPITAL	HOSP_ADDRESS	varchar(50)
HOSPITAL	HOSP_ID	int
HOSPITAL	HOSP_NAME	varchar(20)
HOSPITAL	HOSP_PHONE	bigint
INSURANCE	HOSP_ID	int
INSURANCE	PHARM_ID	int
INSURANCE	POL_DURATION_...	int
INSURANCE	POL_ID	int
INSURANCE	POL_NAME	varchar(10)
MAKES	DRUG_ID	int
MAKES	MANUF_NAME	varchar(20)

Table	Column	Type
MANUFACTURER	MANUF_ADDRESS	varchar(50)
MANUFACTURER	MANUF_NAME	varchar(20)
PATIENT	PAT_AGE	int
PATIENT	PAT_BLOODGRP	varchar(4)
PATIENT	PAT_HT_INCHES	float
PATIENT	PAT_ID	int
PATIENT	PAT_WT_LBS	float
PATIENT	POL_ID	int
PHARMACY	DRUG_ID	int
PHARMACY	PHARM_ADDRESS	varchar(50)
PHARMACY	PHARM_ID	int
PHARMACY	PHARM_NAME	varchar(20)
PHYSICIAN	PHY_FNAME	varchar(10)
PHYSICIAN	PHY_ID	int
PHYSICIAN	PHY_LNAME	varchar(10)
PHYSICIAN	PHY_SPECIALIZAT...	varchar(10)

Table	Column	Type
PHYSICIAN	PHY_SPECIALIZAT...	varchar(10)
PRESCRIPTION	PAT_ID	int
PRESCRIPTION	PHARM_ID	int
PRESCRIPTION	PHY_ID	int
PRESCRIPTION	RX_DATE	date
PRESCRIPTION	RX_ID	int
PRESCRIPTION	RX_SUBTOTAL	float
PRESCRIPTION	RX_TAX	float
PRESCRIPTION_LINES	DRUG_ID	int
PRESCRIPTION_LINES	RX_ID	int
PRESCRIPTION_LINES	RX_LINE_ID	int
PRESCRIPTION_LINES	RX_LINE_PRICE	float
PRESCRIPTION_LINES	RX_LINE_QUANTI...	int
PRICE_QUANT_TOTAL	RX_LINE_ID	int
PRICE_QUANT_TOTAL	RX_LINE_PRICE	float
PRICE_QUANT_TOTAL	RX_LINE_QUANTI...	int
PRICE_QUANT_TOTAL	RX_LINE_TOTAL	float
REGISTERS	PHY_ID	int
REGISTERS	RX_ID	int
SUBTOT_TAX_TOT	RX_ID	int
SUBTOT_TAX_TOT	RX_SUBTOTAL	float
SUBTOT_TAX_TOT	RX_TAX	float
SUBTOT_TAX_TOT	RX_TOTAL	float
TREATS	PAT_ID	int
TREATS	PHY_ID	int
VISITS	HOSP_ID	int
VISITS	PAT_ID	int

10 Answerable Queries:

1. We can query records of PAT_AGE and the premium amount they pay to the INSURANCE to find out the proportionality
2. We can query records to find the diseases every PATIENT is being treated for using the DRUGS, PRESCRIPTION, PRESCRIPTION_LINES and PATIENT table through DRUGS_DISEASE_TREATED attribute
3. We can query the total number of prescriptions, total price of all prescriptions, smallest and largest total and the average total of all prescriptions using PRESCRIPTION and PRESCRIPTION_LINES
4. We can query the most prescribed DRUG_TYPE (inhalers, injections, pills etc) using the DRUGS and PRESCRIPTION_LINES tables
5. We can query the drugs with lowest price and highest price using DRUGS and PRESCRIPTION_LINES tables
6. We can find the different diseases for each PHY_SPECIALIZATION by using DRUGS, PRESCRIPTION, PRESCRIPTION_LINES and PHYSICIAN
7. We can query the number of drugs sold for each manufacturer split by DRUG_NAME using DRUGS, MANUFACTURER, PRESCRIPTION_LINES
8. We can query the net income from the premium for INSURANCE
9. We can query the most opted insurance policy from PATIENT table
10. We can query the state medicinal tax using the PRESCRIPTION and PHARMACY tables. Tax_percent = rx_tax/rx_subtotal * 100

Queries not supported by the database:

1. We cannot get records of which prescription the Insurance has paid for to the pharmacy on behalf of the patient.

== We can resolve this by splitting the RX_TOTAL into RX_COPAY and RX_INS_PAY and linking INSURANCE with PRESCRIPTION ==

2. We cannot get records of over-the-counter drugs bought by the PATIENT as they are not recorded by prescriptions