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CS443

Professor Hadaegh

Assignment 1

1. **a.**

Product (ProductID, ProductDescription)

Receipt (ReceiptNumber, SalesDate)

Item (ItemNum, ItemDescription)

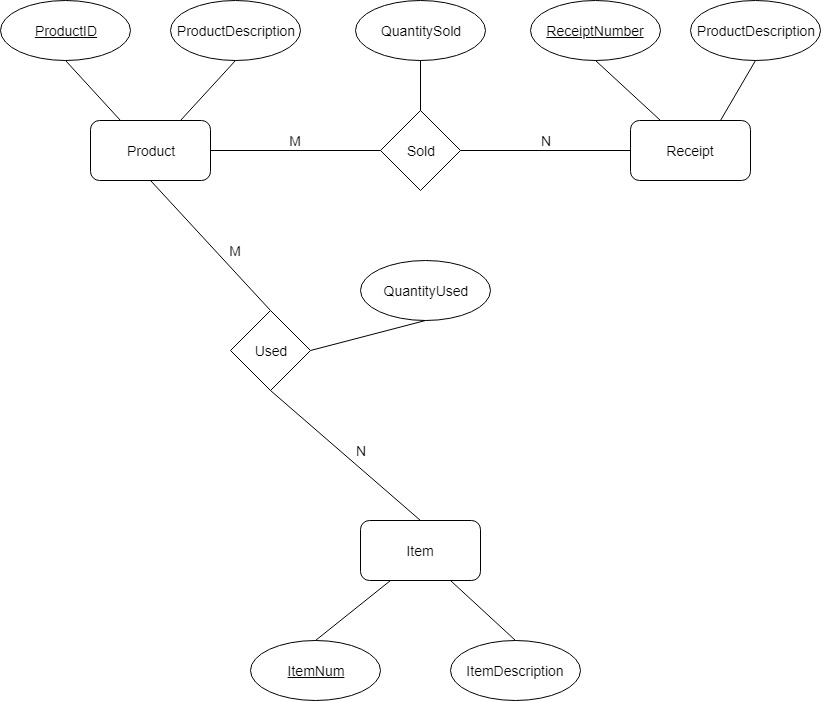
Sold (ProductID\*, ReceiptNumber\*, QuantitySold)

Used (ProductID\*, ItemNum\*, QuantityUsed)

**b.**

The tables are already in third normal form because they do have any derived or transitive dependencies.

**c.**



**d.**

CREATE TABLE Product (

ProductID NUMBER,

ProductDescription VARCHAR2(200),

CONSTRAINT Product\_PK PRIMARY KEY(ProductID)

);

CREATE TABLE Receipt (

ReceiptNumber NUMBER,

SalesDate DATE,

CONSTRAINT Receipt\_PK PRIMARY KEY(ReceiptNumber)

);

CREATE TABLE Item (

ItemNum NUMBER,

ItemDescription VARCHAR2(200),

CONSTRAINT Item\_PK PRIMARY KEY(ItemNum)

);

CREATE TABLE Sold (

ProductID NUMBER,

ReceiptNumber NUMBER,

QuantitySold NUMBER,

CONSTRAINT Sold\_PK PRIMARY KEY(ProductID, ReceiptNumber),

CONSTRAINT Sold\_FK1 FOREIGN KEY(ProductID) REFERENCES

Product(ProductID),

CONSTRAINT Sold\_FK2 FOREIGN KEY(ReceiptNumber) REFERENCES

Receipt(ReceiptNumber),

CONSTRAINT QuantitySold\_CK CHECK(QuantitySold >= 0)

);

CREATE TABLE Used (

ProductID NUMBER,

ItemNum NUMBER,

QuantityUsed NUMBER,

CONSTRAINT Used\_PK PRIMARY KEY(ProductID, ItemNum),

CONSTRAINT Used\_FK1 FOREIGN KEY(ProductID) REFERENCES

Product(ProductID),

CONSTRAINT Used\_FK2 FOREIGN KEY(ItemNum) REFERENCES

Item(ItemNum),

CONSTRAINT QuantityUsed\_CK CHECK(QuantityUsed >= 0)

);

1. **a.**

Physician (PhysID, PhysName, PhysDept, DeptSupervisorId, TreatDesc, TreatCost, TreatId)

Patient (PatientID, PatientName, PatientAddress, HospitalStayDays, AdmitDate, RoomNo, RoomRate, RoomPhone, AmountOwing, PhysID\*)

**b.**

Physician (PhysID, PhysName, PhysDept, TreatId\*)

Department (PhysDept, DeptSupervisorId\*)

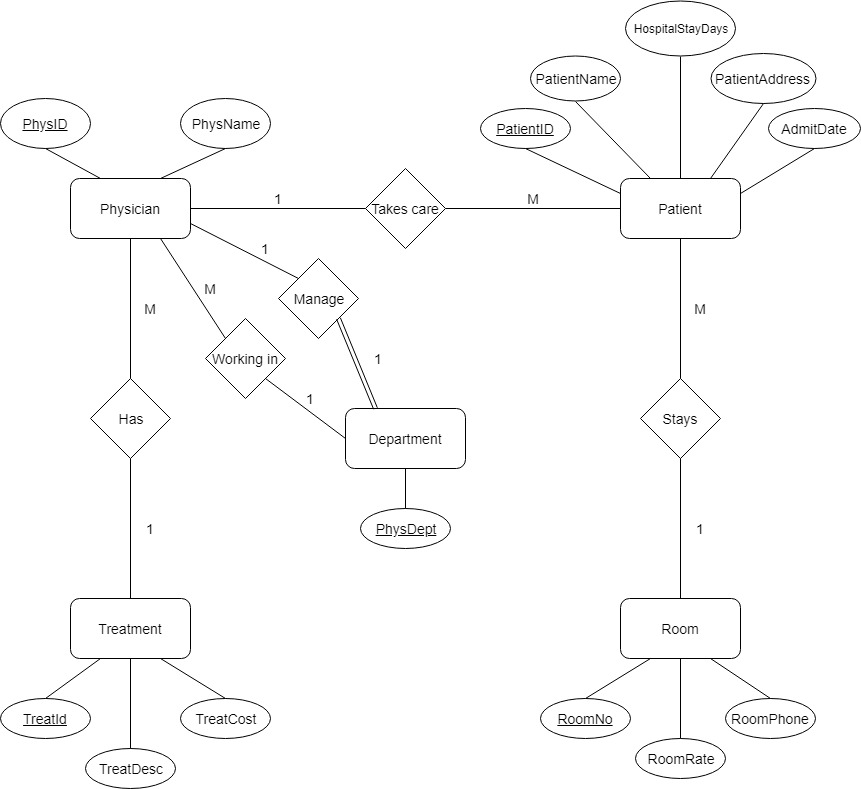
Treatment (TreatId, TreatDesc, TreatCost)

Patient (PatientID, PatientName, PatientAddress, HospitalStayDays, AdmitDate, RoomNo\*, PhysID\*)

Room (RoomNo, RoomRate, RoomPhone)

The table from part a. had transitive and derived dependencies in which can be broken up into separate different tables (Department, Physician, Patient, Room and Treatment). All the tables are now in third normal form.

**c.**



**d.**

CREATE TABLE Room (

RoomNo NUMBER,

RoomPhone VARCHAR(8),

RoomRate NUMBER(10, 2),

CONSTRAINT Room\_PK PRIMARY KEY(RoomNo),

CONSTRAINT RoomRate\_CK CHECK(RoomRate >= 30.00 AND

RoomRate <= 100.00),

CONSTRAINT RoomNo\_CK CHECK(RoomNo >= 100 AND

RoomNo <= 900)

);

CREATE TABLE Department (

PhysDept NUMBER,

DeptSupervisorId NUMBER,

CONSTRAINT Department\_PK PRIMARY KEY(PhysDept)

);

CREATE TABLE Treatment (

TreatId NUMBER,

TreatDesc VARCHAR2(200),

TreatCost NUMBER(10, 2),

CONSTRAINT Treatment\_PK PRIMARY KEY(TreatId),

CONSTRAINT TreatCost\_CK CHECK(TreatCost >= 50.00)

);

CREATE TABLE Physician (

PhysID NUMBER,

PhysName VARCHAR2(50) ,

CONSTRAINT PhysName\_Null NOT NULL,

DeptSupervisorId NUMBER,

PhysDept NUMBER.

TreatId NUMBER,

CONSTRAINT Physician\_PK PRIMARY KEY(PhysID),

CONSTRAINT Physician\_FK1 FOREIGN KEY(PhysDept) REFERENCES

Department(PhysDept),

CONSTRAINT Physician\_FK2 FOREIGN KEY(TreatId) REFERENCES

Treatment(TreatId)

);

CREATE TABLE Patient (

PatientID NUMBER,

PhysName VARCHAR2(50),

CONSTRAINT PhysName\_Null NOT NULL,

PatientAddress VARCHAR2(200),

CONSTRAINT PatientAddress\_Null NOT NULL,

HospitalStayDays NUMBER,

AdminDate DATE,

RoomNo NUMBER,

PhysID NUMBER,

CONSTRAINT Patient\_PK PRIMARY KEY(PatientID),

CONSTRAINT Patient\_FK1 FOREIGN KEY(RoomNo) REFERENCES

Room(RoomNo),

CONSTRAINT Patient\_FK2 FOREIGN KEY(PhysID) REFERENCES

Physician(PhysID)

CONSTRAINT HospitalStayDays\_CK CHECK(HospitalStayDays >= 0)

);

ALTER TABLE DEPARTMENT

ADD CONSTRAINT Department\_FK1 FOREIGN KEY(DepartSupervisorId) REFERENCES

Physician(PhysID);

1. A (A1, A2)

B (B1, B2, A1, C1)

C (C1, C2)

D (D1, D5, D2, D3, D4)

E (E1, E2, (D1, D5)\*, AttOfR4)

F (F1, F2, F3, F4, (D1, D5, E1)\*, AttOfR5)

R3 (AttOfR3, C1\*, (D1, D5)\*)

1. BANK (Code, Name, Addr)

BANK-BRANCH (BranchNo, Code\*, Addr)

LOAN (LoanNo, Amount, Type, Code\*, BranchNo\*)

ACCOUNT (AcctNo, Balance, Type, Code\*, BranchNo\*)

CUSTOMER (SSN, Name, Phone, Addr)

A-C (AcctNo\*, SSN\*)

L-C (LoanNo\*, SSN\*)

