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CS 443

2 March 2020

Assignment 1

**Question 1**

A) **Write the tables**

Product (ProductID, ProductDescription)

Item (ItemNum, ItemDescription)

Receipt (ReceiptNum, SalesDate)

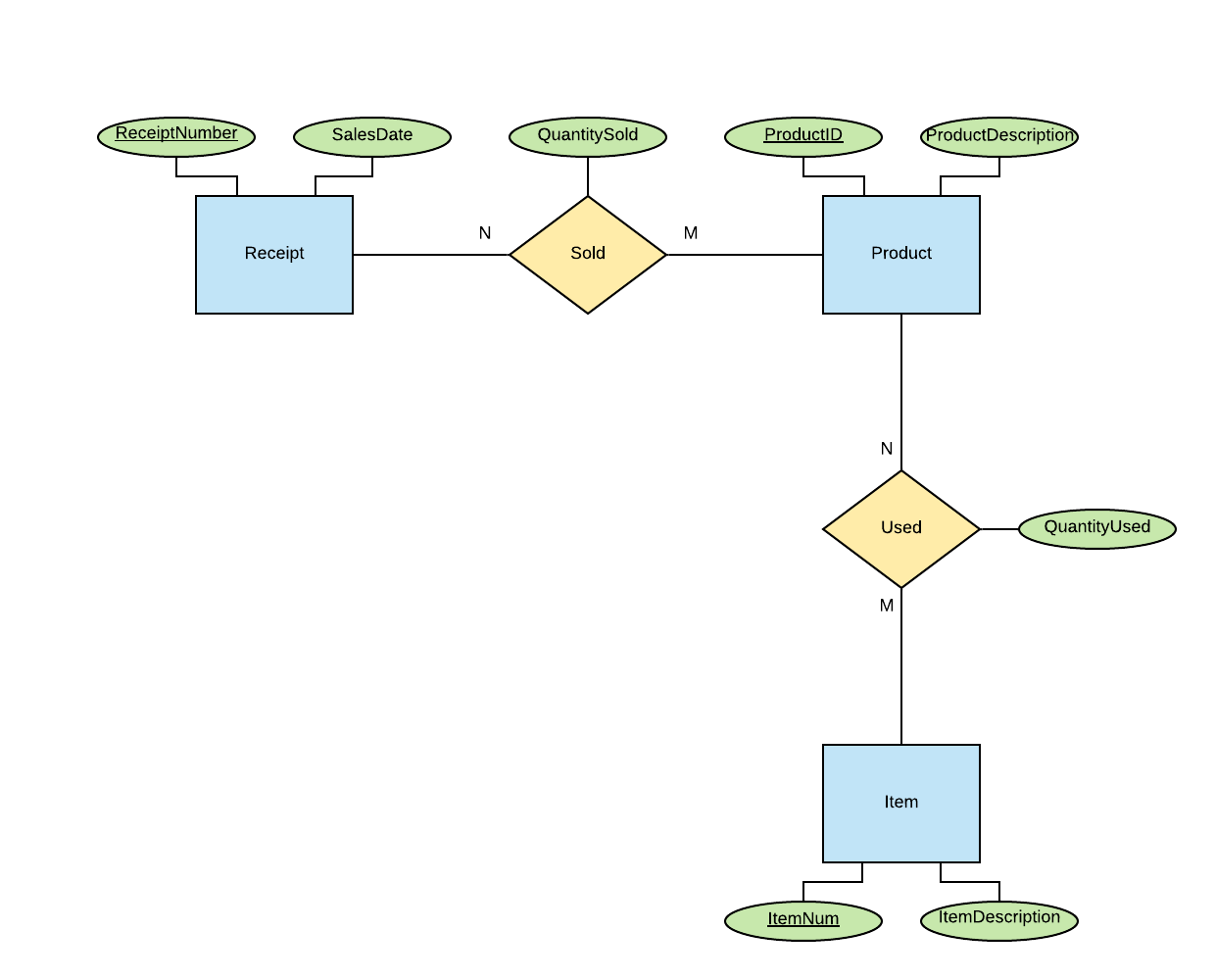
Used (ProductID\*, ItemNum\*, QuantityUsed)

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

B) **Place the tables in 3rd normal form (if necessary)**

The initial table that was given in the problem had transitive dependencies but the initial table is able to branch off into 5 tables like in question 1A. The 5 tables the initial table created are Product, Item, Receipt, Used, and Sold.

C) **Create ERD based on the normalized tables**



D) **Write a script to create a database. Your script should create the tables and ensures that all constraints are set properly.**

DROP TABLE Product;

DROP TABLE Item;

DROP TABLE Receipt;

DROP TABLE Used;

DROP TABLE Sold;

CREATE TABLE Product (

ProductID NUMBER,

ProductDescription VARCHAR2(200),

CONSTRAINT Product\_PriKey PRIMARY KEY(ProductID)

);

CREATE TABLE Item (

ItemNum NUMBER,

ItemDescription VARCHAR2(200),

CONSTRAINT Item\_PriKey PRIMARY KEY(ItemNum)

);

CREATE TABLE Receipt (

ReceiptNumber NUMBER,

SalesDate DATE,

CONSTRAINT Receipt\_PriKey PRIMARY KEY(ReceiptNumber)

);

CREATE TABLE Used (

ProductID NUMBER,

ItemNum NUMBER,

QuantityUsed NUMBER,

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

CONSTRAINT Used\_ForKey1 FOREIGN KEY(ProductID) REFERENCES Product(ProductID),

CONSTRAINT Used\_ForoKey2 FOREIGN KEY(ItemNum) REFERENCES Item(ItemNum),

CONSTRAINT QuantityUsed\_Check CHECK(QuantityUsed >= 0)

);

CREATE TABLE Sold (

ProductID NUMBER,

ReceiptNumber NUMBER,

QuantitySold NUMBER,

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

CONSTRAINT Sold\_ForKey1 FOREIGN KEY(ProductID) REFERENCES Product(ProductID),

CONSTRAINT Sold\_ForKey2 FOREIGN KEY(ReceiptNumber) REFERENCES Receipt(ReceiptNumber),

CONSTRAINT QuantitySold\_Check CHECK(QuantitySold >= 0)

);

**Question 2**

A) **Change the ERD to tables**

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

Patient (PatientID, PhysID\*, PatientName, PatientAddress, AdminDate, HospitalStaydays, RoomPhone, RoomNo, RoomRate, AmountOwing)

B) **Place the tables in 3rd normal form (if necessary)**

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

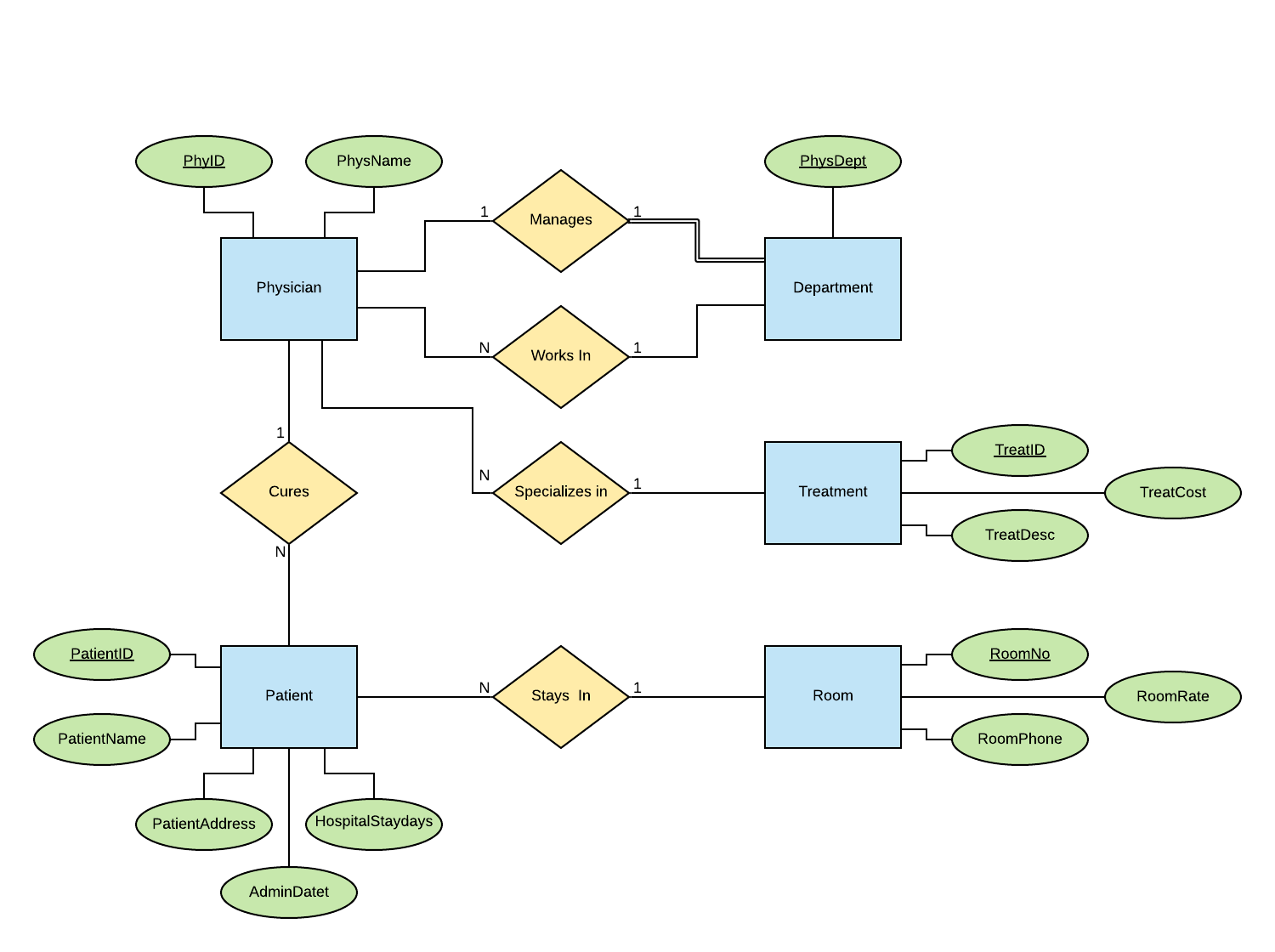
Department (PhysDept, DeptSupervisorID\*)

Treatment (TreatID,TreatCost,TreatDesc)

Patient (PatientID, PatientName, PatientAddress, AdminDate, HospitalStaydays, RoomNo\*, PhysID\*)

Room (RoomNo, RoomPhone, RoomRate)

C) **Revise the given ERD based on the normalized tables (if necessary)**



D) **Your script should create the tables and ensures that all constraints are set properly.**

DROP TABLE Physician;

DROP TABLE Department;

DROP TABLE Treatment;

DROP TABLE Patient;

DROP TABLE Room;

CREATE TABLE Physician (

PhysID NUMBER,

PhysName VARCHAR2(50),

PhysDept NUMBER,

TreatID NUMBER,

CONSTRAINT PhysName\_Null NOT NULL,

CONSTRAINT Physician\_PriKey PRIMARY KEY(PhysID),

CONSTRAINT Physician\_ForKey1 FOREIGN KEY(PhysDept) REFERENCES Department(PhysDept),

CONSTRAINT Physician\_ForKey2 FOREIGN KEY(TreatID) REFERENCES Treatment(TreatID)

);

CREATE TABLE Department (

PhysDept NUMBER,

DeptSupervisorID NUMBER,

CONSTRAINT Department\_PriKey PRIMARY KEY(PhysDept)

);

CREATE TABLE Treatment (

TreatID NUMBER,

TreatCost NUMBER(10, 2),

TreatDesc VARCHAR2(200),

CONSTRAINT Treatment\_PriKey PRIMARY KEY(TreatID),

CONSTRAINT TreatCost\_Check CHECK(TreatCost >= 50.00)

);

CREATE TABLE Patient (

PatientID NUMBER,

PatientName VARCHAR2(50),

PatientAddress VARCHAR2(200),

AdminDate DATE,

HospitalStayDays NUMBER,

RoomNo NUMBER,

PhysID NUMBER,

CONSTRAINT PatientName\_Null NOT NULL,

CONSTRAINT PatientAddress\_Null NOT NULL,

CONSTRAINT Patient\_PriKey PRIMARY KEY(PatientID),

CONSTRAINT Patient\_ForKey1 FOREIGN KEY(RoomNo) REFERENCES Room(RoomNo),

CONSTRAINT Patient\_ForKey2 FOREIGN KEY(PhysID) REFERENCES Physician(PhysID),

CONSTRAINT HospitalStayDays\_Check CHECK(HospitalStayDays >= 0)

);

CREATE TABLE Room (

RoomNo NUMBER,

RoomPhone VARCHAR(8),

RoomRate NUMBER(10, 2),

CONSTRAINT Room\_PriKey PRIMARY KEY(RoomNo),

CONSTRAINT RoomRate\_Check CHECK(RoomRate >= 30.00 AND RoomRate <= 100.00),

CONSTRAINT RoomNo\_Check CHECK(RoomNo >= 100 AND RoomNo <= 999)

);

ALTER TABLE DEPARTMENT

ADD CONSTRAINT Department\_ForKey1 FOREIGN KEY(DeptSupervisorID) REFERENCES Physician(PhysID);

**Question 3**

A (A1, A2)

B (B1, B2, A1, C1)

C (C1, C2)

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

E (E1, (D1\*, D5\*), E2, AttOfR5)

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

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

**Question 4**

Bank (Code, Name, Addr)

Bank-Branch (BranchNo, Code\*, Addr)

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

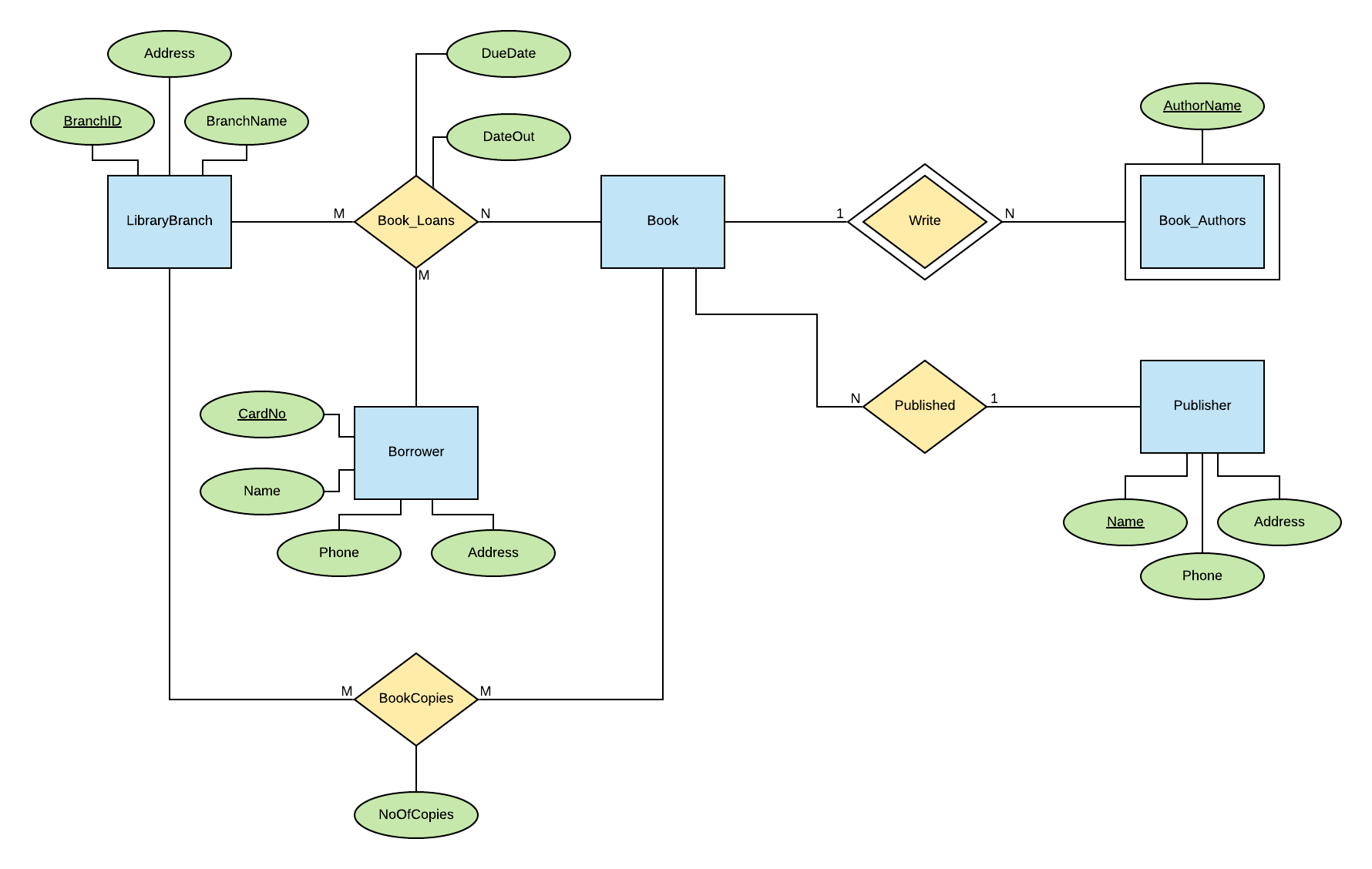
Loan (LoanNo, Account, Type, BranchNo\*, Code\*)

Customer (SSN, Name, Phone, Addr)

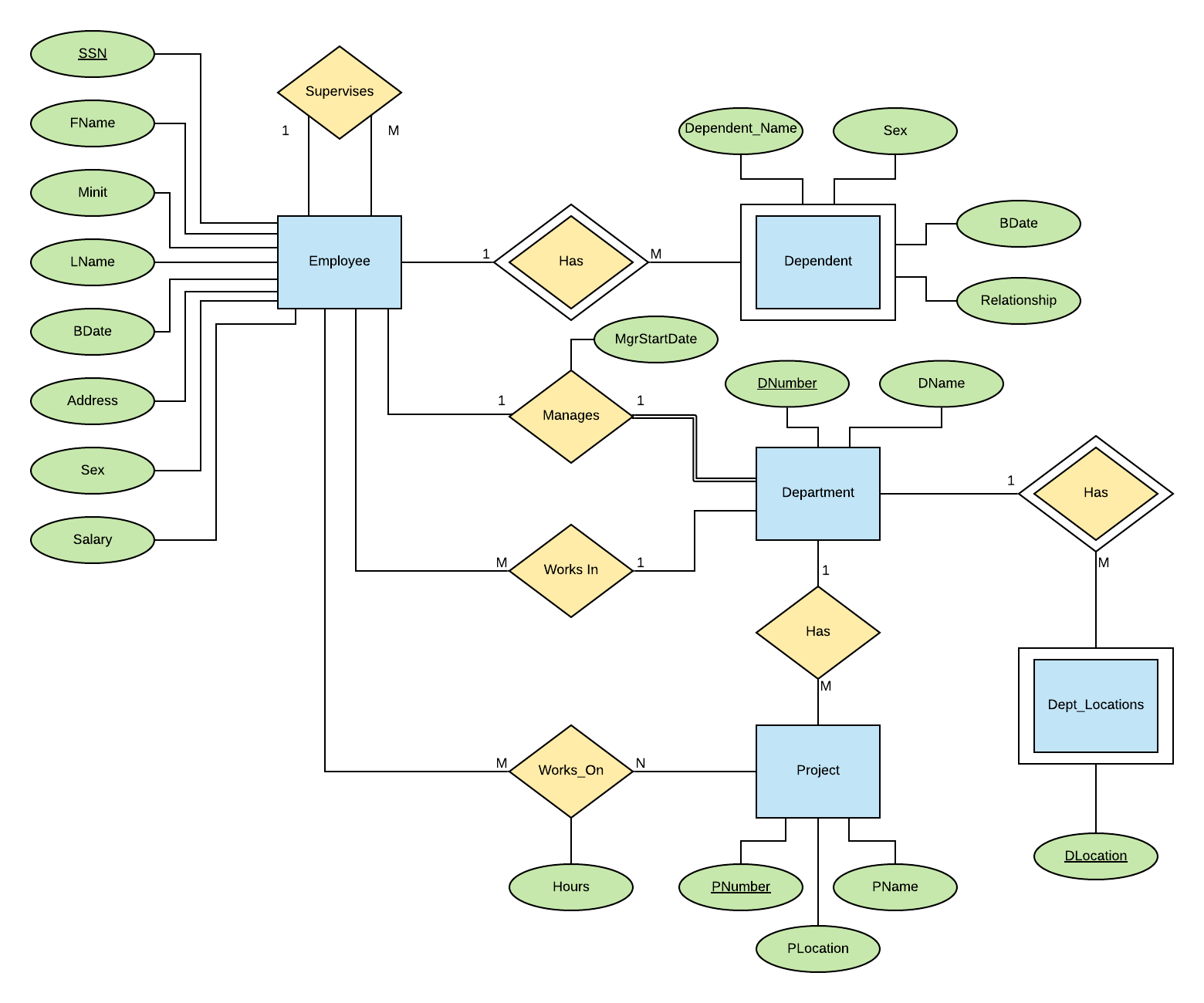
A-C (AcctNo\*, SSN\*)

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

**Question 5**



**Question 6**

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