CSC 423 Project Part #2 Vraj Patel

A. Derive relations from the conceptual model

Clinic(**clinicNo**,clinicName,address, phoneNum, managerStaffNo) Primary key clinicNo Foreign Key managerStaffNo **references** staff(staffNo)	Owner(**ownerNo**, name, address, ownerPhone,clinicNo) Primary key: OwnerNo Foreign key: clinicNo **references** Clinic(clinicNo)
Staff(**staffNo**, name, address, staffPhone, DOB, position, salary,clinicNo) Primary key: staffNo Foreign key: clinicNo references Clinic(clinicNo)	Pet(**petNo**, name,DOB,species,breed,color, ownerNo,clinicNo) Primary key :PetNo Foreign key: ownerNo **references** Owner(ownerNo) Foreign key: clinicNo **references** Clinic(clinicNo)
Examination(**examNo**,chiefComplaint,date,actionTaken,petNo,staffNo,clinicNo) Primary key: examNo Foreign key: petNo **references** Pets(petNo) Foreign key: staffNo **references** Staff(staffNo) Foreign key: clinicNo **references** Clinic(clinicNo)	

B. Validate the logical model using normalization to 3NF
   a. None of the relations in this model have repeating groups, so we know that it is already in 1NF
   b. As for 2NF, there are no partial dependencies on the primary key- since each primary key is made up of only one attribute
   c. Given the fact that there are no non-primary key dependencies on other non-primary keys(no transitive dependencies), the tables are already in 3NF.

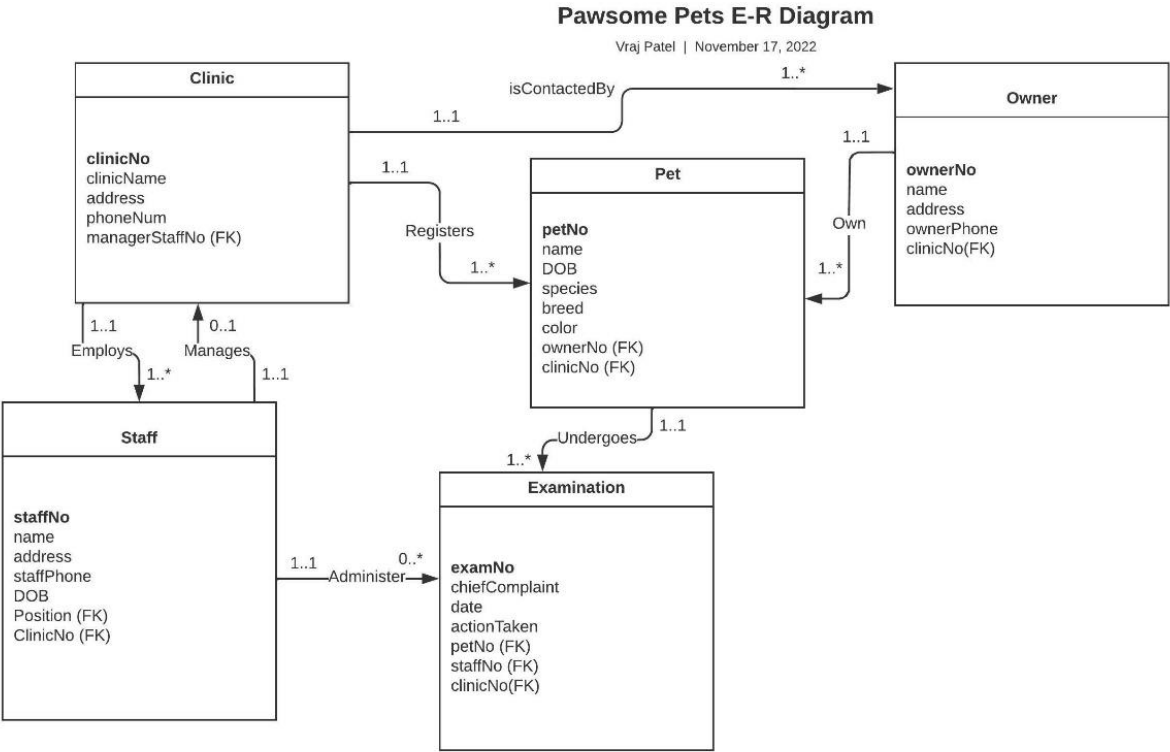C. Validate the logical model against user transactions
   a. What are the StaffNo, names, and positions of staff members who earn more than $30,000 a year?
      i. For this in our select statement we must choose staffNo, name, position
      ii. From the staff table
      iii. Where the value in the salary field is greater than $30,000
   b. How many pets does the owner with the ownerNo 211 have?
      i. From the pet relation where the ownerNo = 211, we count the amount of petNo fitting this description.
   c. What are the clinic numbers and names of clinic with no staff members as managers?
      i. For this in our select statement we must select clinicNo and name
      ii. From the clinic table
      iii. Where managerStaffNo = NULL
   d. What are the names of pets that were examined for a broken bone?
      i. For this in our select statement we must select pet.name
      ii. From the tables Pet pet, Examination exam
      iii. Where exam.chiefComplaint = "Broken Bone" AND exam.petNo = pet.petNo
   e. How many examinations were performed on 11/18/2022?

        i. For this in our select statement we would count examNo
       ii. From the Examination table
      iii. Where date = 18-NOV-2022

D. Define Integrity constrains
- a. Primary key constraints
    - i. Clinic: clinicNo – NOT NULL, UNIQUE
    - ii. Owner: ownerNo- NOT NULL, UNIQUE
    - iii. Staff: staffNo – NOT NULL, UNIQUE
    - iv. Exam: examNo- NOT NULL, UNIQUE
    - v. Pet: petNo – NOT NULL, UNIQUE
- b. Referential integrity/Foreign key constraints (note: most of the foreign keys are primary keys in other tables)
    - i. Clinic
        1. clinicNo: on DELETE CASCADE
            - a. The tables Owner, Pet, and Staff have clinicNo as a foreign key that references Clinic(clinicNo)
    - ii. Owner
        1. ownerNo: DELETE CASCADE
            - a. The table pet has ownerNo as a foreign key that references Owner(ownerNo)
    - iii. Pet
        1. petNo: on DELETE CASCADE
            - a. The table examination has petNo as a foreign key that references Pet(petNo)
    - iv. Staff
        1. staffNo: on DELETE CASCADE
            - a. The table Clinic has a foreign key called managerStaffNo which references Staff(staffNo)
            - b. The table Examination has staffNo as a foreign key that references Staff(staffNo)
- c. Alternate key constraints (Note: only the relations with alternate keys are listed below)
    - i. Owner
        1. ownerPhone
    - ii. Clinic
        1. address
        2. phoneNum
    - iii. Staff
        1. staffPhone
- d. Required data (Attributes of each table that cannot be null)
    - i. Clinic
        1. clinicNo:
        2. phoneNum
        3. address
    - ii. Owners

1. ownerNo
2. ownerPhone
  iii. Staff
1. staffNo:
2. staffPhone
  iv. Pet
1. petNo
  v. Examination
1. examNo
e. Attribute domain constraints (only the attributes of each relation that **require** constraints are listed, also does not include primary or alternate key constraints because those were already addressed in previous steps)
  i. Clinic
1. clinicNo: check (clinicNo >0)
2. phoneNum: check(length(phoneNum) =10)
3. managerStaffNo: check(managerStaffNo > 0)
  ii. Owner
1. ownerNo: check (ownerNo >0)
2. ownerPhone: check(length(ownerPhone) = 10)
  iii. Staff
1. staffNo: check(staffNo >0)
2. DOB: check (DOB < 01-JAN-2004)
  a. Employees must be at least 18 years of age
3. staffPhone: check(length(staffPhone) = 10)
4. Salary: check(salary >0)
  iv. Pet
1. petNo: check(petNo >0)
2. DOB: check (DOB < current date)
  v. Examination
1. examNo: check (examNo >0)
2. Date: check(date <= current date)
f. General Constraints
  i. All Primary keys are number values
  ii. Staff(salary) is a number value
  iii. Every other attribute is a varchar

PART E IS ON THE NEXT PAGE

Pawsome Pets E-R Diagram

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E)

Clinic

clinicNo
clinicName
address
phoneNum
managerStaffNo (FK)

isContactedBy

1..*

1..1

Owner

ownerNo
name
address
ownerPhone
clinicNo(FK)

1..1

Own

1..*

1..1

Registers

1..*

Pet

petNo
name
DOB
species
breed
color
ownerNo (FK)
clinicNo (FK)

1..1   0..1

Employs   Manages

1..*   1..1

1..1

Undergoes

1..*

1..1

Staff

staffNo
name
address
staffPhone
DOB
Position (FK)
ClinicNo (FK)

1..1   Administer   0..*

Examination

examNo
chiefComplaint
date
actionTaken
petNo (FK)
staffNo (FK)
clinicNo(FK)

Primary keys of each table are bolded.