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CSC 423

Project - Part 2

2. Develop a logical data model based on the following requirements: (11/17/22)
   a. Derive relations from the conceptual model.
      - Clinic (**clinicNo**, name, address, phoneNo, managerNo)
      - Staff (**staffNo**, name, address, phoneNo, dob, position, salary, clinicNo)
      - Examination (**examNo**, chiefComplaint, description, dateSeen, actionsTaken, staffNo, petNo)
      - Pets (**petNo**, name, dob, species, breed, color, clinicNo, ownerNo)
      - Owner (**ownerNo**, name, address, phoneNo)
   b. Validate the logical model using normalization to 3NF.
      - The logical data model is in 3NF as there are no transitive dependencies, and all non-prime attributes are directly dependent on the entire candidate key.
   c. Validate the logical model against user transactions.
      - List all exams done on golden retrievers and the staff name for the staffNo (a23) who performed the examination

```
SELECT e.examNo, e.dateSeen, e.chiefComplaint, e.description, e.actionsTaken, s.name AS
staffName
FROM Examination e
JOIN Staff s ON e.staffNo = s.staffNo
JOIN Pet p ON e.petNo = p.petNo
WHERE p.breed = 'Golden Retriever' AND e.staffNo = '23';
```

      - List all the pet owners going to a specific clinic

```
SELECT o.ownerNo, o.name AS ownerName, o.address AS ownerAddress, o.telephone AS
ownerTelephone
FROM Owner o
JOIN Pet p ON o.ownerNo = p.ownerNo
JOIN Clinic c ON p.clinicNo = c.clinicNo
WHERE c.clinicNo = '001';
```

      - List all the Pets that are owned by the same person

```
SELECT o.name AS ownerName, p.petNo, p.name AS petName, p.species, p.breed, p.color
FROM Owner o
JOIN Pet p ON o.ownerNo = p.ownerNo
WHERE o.ownerNo IN (
   SELECT ownerNo
   FROM Pet
   GROUP BY ownerNo
   HAVING COUNT(*) > 1
);
```

      - List all clinics and all staff registered in them

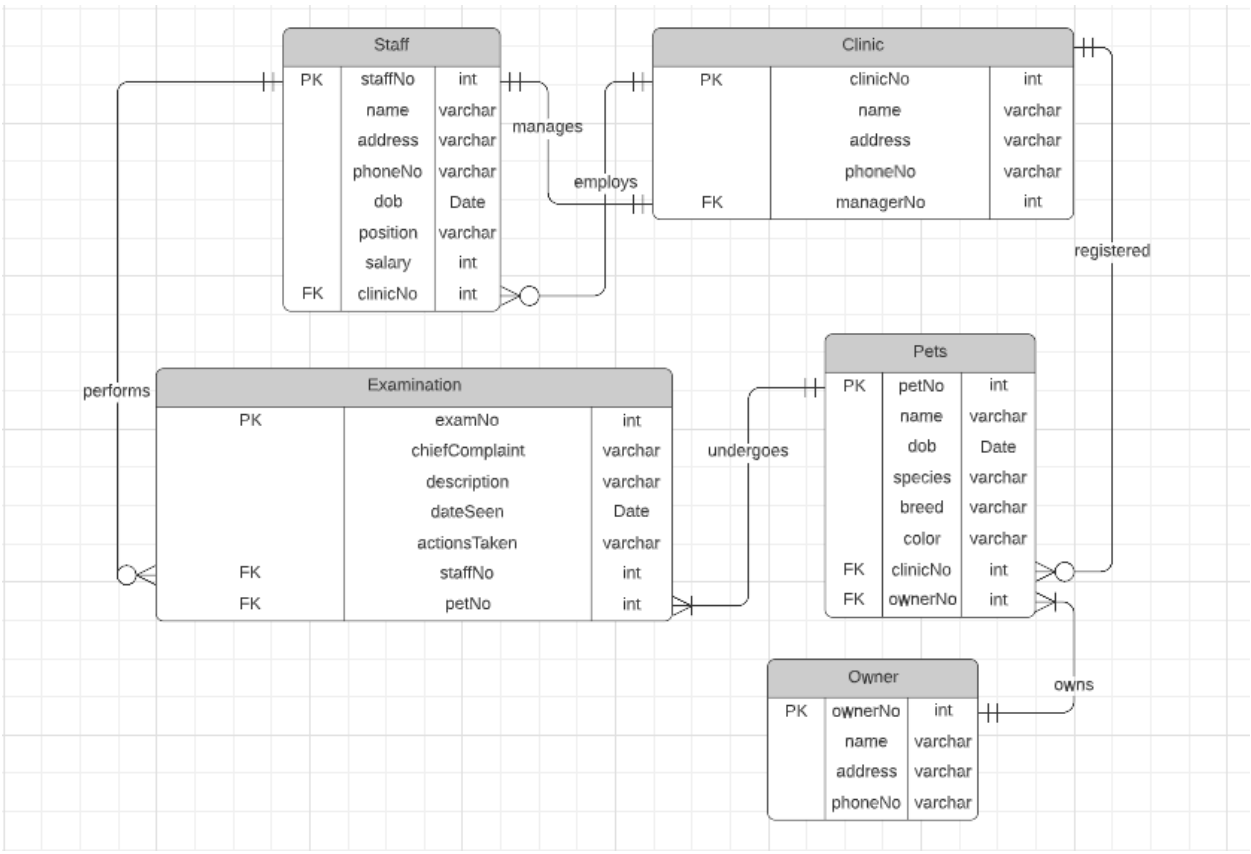
```
SELECT *
FROM Clinic c
LEFT JOIN Staff s ON c.clinicNo = s.clinicNo;
```

- List all staff in ‘secretary’ positions

```
SELECT *
FROM Staff
WHERE position = 'secretary';
```

d. Define integrity constraints:
   - Primary key constraints.
     - NOT NULL
     - UNIQUE
   - Referential integrity/Foreign key constraints.
     - Must reference an existing value
     - All foreign key values must be valid
   - Alternate key constraints (if any).
   - Required data
     - Must not be null
   - Attribute domain constraints.
     - clinicNo, staffNo, ownerNo, petNo, examNo: integer
     - name, address, animal species, breed, color, chief complaint, description, actions taken: varchar
     - telephone number: varchar (formatted as a phone number)
     - DOB, date seen: date
   - General constraints (if any).
     - A member of staff manages at most one clinic (not all staff manage clinics).
     - An owner can own one or more pets, but a pet can only be registered at one clinic.
     - A pet can undergo many examinations by many members of staff, but an examination can only be performed on one pet by one member of staff.

e. Generate the E-R diagram for the logical level (contains FKs as attributes).


Staff
PK staffNo int
name varchar
address varchar
phoneNo varchar
dob Date
position varchar
salary int
FK clinicNo int
manages
employs
Clinic
PK clinicNo int
name varchar
address varchar
phoneNo varchar
FK managerNo int
registered
performs
Examination
PK examNo int
chiefComplaint varchar
description varchar
dateSeen Date
actionsTaken varchar
FK staffNo int
FK petNo int
undergoes
Pets
PK petNo int
name varchar
dob Date
species varchar
breed varchar
color varchar
FK clinicNo int
FK ownerNo int
owns
Owner
PK ownerNo int
name varchar
address varchar
phoneNo varchar