

a. Identify the main entity types:

The main entities based on the description are:

1. **Clinic** – A unique location for the company where operations are conducted
2. **Staff** – The employees that work for the company Pawsome Pets
3. **Owner** – A unique individual who owns at least one pet
4. **Pet** – An animal that is serviced by Pawsome Pets
5. **Examination** – An assessment conducted by a staff member of Pawsome Pets

b. Identify the main relationship types between the entity types identified in "a":

1. **Clinic-Staff:** Staff work at clinics, and each clinic has several staff members. A staff member may manage one clinic, though not all staff manage clinics.
2. **Owner-Pet:** Each owner can own multiple pets, but each pet is associated with only one owner.
3. **Clinic-Owner:** An owner registers their pets with a specific clinic, so each owner is registered at one clinic.
4. **Pet-Examination:** Each examination is conducted on one pet, and a pet can have multiple examinations over time.
5. **Staff-Examination:** Each examination is performed by a member of the consulting staff, though a staff member can conduct multiple examinations over time.

c. Determine the multiplicity constraints for each relationship identified in "b":

1. **Clinic-Staff:**
 - A clinic can have multiple staff members, but each staff member works at one clinic.
 - A staff member may manage at most one clinic, but this is optional for each staff member (i.e., not all staff manage clinics).
2. **Owner-Pet:**
 - An owner can have multiple pets.
 - Each pet is owned by one and only one owner.
3. **Clinic-Owner:**
 - An owner is registered with one clinic.
 - Each clinic can have multiple owners.
4. **Pet-Examination:**
 - Each pet can have multiple examinations.

- Each examination is associated with only one pet.

5. **Staff-Examination:**

- A staff member can perform multiple examinations.
- Each examination is conducted by one staff member.

d. Identify attributes and associate them with entity or relationship types:

1. **Clinic:**

- **Attributes:** clinicNo (unique), clinicName, address, telephone

2. **Staff:**

- **Attributes:** staffNo (unique), name, address, telephone, DOB, position, salary

3. **Owner:**

- **Attributes:** ownerNo (unique), name, address, telephone

4. **Pet:**

- **Attributes:** petNo (unique), name, DOB, species, breed, color

5. **Examination:**

- **Attributes:** examNo (unique), chiefComplaint, description, dateSeen, actionsTaken

6. **Relationships:**

- **Clinic-Staff** (for management role):
 - Attribute: isManager (indicating if the staff member is the manager of the clinic)

e. Determine candidate and primary key attributes for each (strong) entity type:

1. Clinic

- **Attributes:** clinicNo (unique), clinicName, address, telephone
- **Candidate Keys:**
 - **clinicNo:** Each clinic has a unique clinic number.
 - **address:** Assuming each clinic is located at a unique address, address could serve as a candidate key.
 - **telephone:** If each clinic has a unique telephone number, this could also be a candidate key.
- **Primary Key:** clinicNo (chosen for its uniqueness and simplicity)

2. Staff

- **Attributes:** staffNo (unique), name, address, telephone, DOB, position, salary
- **Candidate Keys:**
 - staffNo: Unique staff number assigned to each staff member.
 - Combination of name and DOB: While less reliable due to the possibility of name duplication, combining name and DOB could potentially serve as a candidate key.
 - telephone: If each staff member has a unique telephone number.
- **Primary Key:** staffNo (selected for its guaranteed uniqueness)

3. Owner

- **Attributes:** ownerNo (unique), name, address, telephone
- **Candidate Keys:**
 - ownerNo: Unique owner number assigned to each pet owner.
 - Combination of name and address: Could serve as a candidate key if we assume no two owners with the same name live at the same address.
 - telephone: If we assume each owner has a unique telephone number.
- **Primary Key:** ownerNo (chosen due to its uniqueness)

4. Pet

- **Attributes:** petNo (unique), name, DOB, species, breed, color
- **Candidate Keys:**
 - petNo: Unique pet number assigned to each pet.
 - Combination of name, DOB, and ownerNo: Assuming an owner cannot have two pets with the same name and date of birth.
 - Combination of microchipID: If pets are microchipped and each chip has a unique ID (Note: This attribute wasn't mentioned but is common in pet records).
- **Primary Key:** petNo (selected for its guaranteed uniqueness)

5. Examination

- **Attributes:** examNo (unique), chiefComplaint, description, dateSeen, actionsTaken

- **Candidate Keys:**
 - **examNo:** Unique examination number assigned to each examination.
 - **Combination of petNo, dateSeen, and staffNo:** If we assume a pet can only have one examination per day with the same staff member.
 - **Combination of petNo and dateSeen:** Assuming a pet has only one examination per day.
- **Primary Key:** examNo (chosen for its simplicity and uniqueness)