

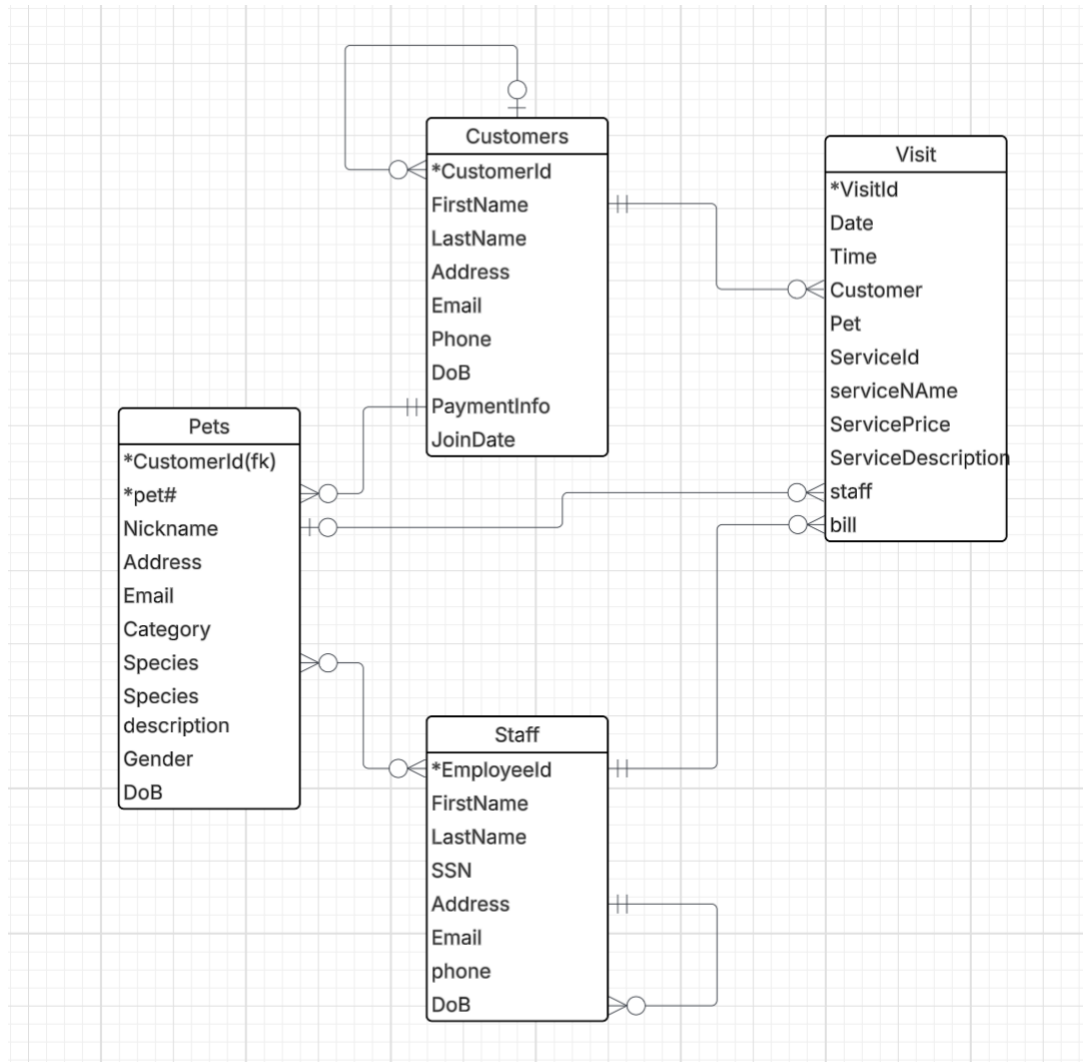
Summary about the entities:

- Customers: CustomerID, FirstName, LastName, Address, Email, Phone, DoB, PaymentInfo, JoinDate. CustomerID is the identifier.
- Pets: CustomerID, Pet#, NickName, Address, Email, Phone, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes. CustomerID and Pet# together as the identifier.
- Staff: EmployeeID, FirstName, LastName, SSN, Address, Email, Phone, DoB. EmployeeID is the identifier.
- Visit: VisitID, Date, Time, Customer, Pet, ServiceID, ServiceName, ServicePrice, ServiceDescription, Staff, Bill, Paid. VisitID is the identifier.

Their relationships are:

- A customer may have one or more (zero or more) pets; A pet must belong to one and only one (exactly one) customer.
- A staff may treat one or more pets (zero or more); and A pet may be familiar with one or more (zero or more) staff.
- A customer may have one or more (zero or more) visits; and each visit must be done by one and only one (exactly one) customer.
- A pet may have one or more (zero or more) visits; and each visit may involve one (zero or one) pet.
- A staff must be in charge of one or more (one or more) visits; and a visit must be charged by one and only one (exactly one) staff.
- A customer may be referred by one (zero or one) customer; and a customer may refer one or more (one or more) customers.

- A staff must have one and only one (exactly one) supervisor; A staff may supervise one or more (zero or more) staff.



Relational model

Customers(CustomerID, FirstName, LastName, Address, Email, Phone, DoB, PaymentInfo, JoinDate, ReferralId(fk))

Pets: (CustomerID(fk), Pet#, NickName, Address, Email, Phone, Category, Species, SpeciesDescription, Gender, DoB)

Staff(EmployeeID, FirstName, LastName, SSN, Address, Email, Phone, DoB, SupervisorId(fk))

Visit(*VisitID, Date, Time, Customer, Pet, ServiceID, ServiceName, ServicePrice, ServiceDescription, Staff, Bill, Paid, CustomerId(fk), pet#(fk), EmployeeId(fk))

Staff_pet(*EmployeeId(fk), *CustomerID(fk), *Pet#(fk))

Normalization:

- Customers (CustomerID, FirstName, LastName, Address, Email, Phone, DoB, PaymentInfo, JoinDate, ReferredByCustomerID(fk)).
 - FD1: CustomerID → FirstName, LastName, Address, Email, Phone, DoB, PaymentInfo, JoinDate, ReferredByCustomerID
- Pets (CustomerID(fk), Pet#, NickName, Address, Email, Phone, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes).
 - FD1: CustomerID, Pet# → NickName, Address, Email, Phone, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes.
 - FD2: CustomerID → Address, Email, Phone
 - FD3: Species/Breed → Species/Breed Description
- Staff (EmployeeID, FirstName, LastName, SSN, Address, Email, Phone, DoB, SupervisorID(fk)).
 - FD1: EmployeeID → FirstName, LastName, SSN, Address, Email, Phone, DoB, SupervisorID
- Visit (VisitID, Date, Time, CustomerID(fk), Pet(fk), ServiceID, ServiceName, ServicePrice, ServiceDescription, EmployeeID(fk), Bill, Paid).
 - FD1: VisitID → Date, Time, CustomerID, Pet, ServiceID, ServiceName, ServicePrice, ServiceDescription, EmployeeID, Bill, Paid
 - FD2: ServiceID → ServiceName, ServicePrice, ServiceDescription.
- Pets_Staff(CustomerID(fk), Pet#(fk), EmployeeID(fk))
 - There is no non-primary-key attribute.

2NF

- Pets1 (CustomerID(fk), Pet#, NickName, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes).
 - FD1: CustomerID, Pet# → NickName, Address, Email, Phone, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes.
 - FD3: Species/Breed → Species/Breed Description

3NF:

- Pets2 (CustomerID(fk), Pet#, NickName, Category, Species/Breed(fk), Gender, DoB, Notes).
 - FD1: CustomerID, Pet# → NickName, Address, Email, Phone, Category, Species/Breed, Species/Breed Description, Gender, DoB, Notes.
- Species(Species/Breed, Species/Breed Description)
 - FD3: Species/Breed → Species/Breed Description
- Visit2 (VisitID, Date, Time, CustomerID(fk), Pet(fk), ServiceID (fk), EmployeeID(fk), Bill, Paid).
 - FD1: VisitID → Date, Time, CustomerID, Pet, ServiceID, ServiceName, ServicePrice, ServiceDescription, EmployeeID, Bill, Paid
- Service(ServiceID, ServiceName, ServicePrice, ServiceDescription).
 - FD2: ServiceID → ServiceName, ServicePrice, ServiceDescription.
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