**Animal Rescue Databook**

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**Part 1: Database Narrative**

**Database Description:**

The Animal Rescue Database is created to assist the rescue organization in collecting, storing, and maintaining information regarding the various bodies that are involved in the animal rescue process. This database can be used by the rescue staff to manage information stored in the 14 tables relating to pets, breeds, vets, clinics, vet appointments, owners, pet adoptions, fosters, foster assignments, staffs, salaries, invoices, donators, and donations.

The PET table allows the staff to enter the details of new pets or edit the existing pet details. Year-end summary report of how the rescue is doing can be generated. They can find the number of new pets rescued each year, the number of pets they managed to find homes or foster homes, the number of pets which passed away in their care. They can answer questions like how many pets are left unadopted each year, whether senior pets have a disadvantage when it comes to adoption etc.

The BREED table provides further details of each pet such as the pet’s breed (poodle, Siamese cat, etc), type (dog, cat, frog etc), vertebrate group (mammal, bird, amphibian, reptile, or fish), life expectancy of each pet, its dietary habits, and qualities etc. The staff will be able to get a summary report for each breed such as the average number of poodles or pugs rescued in a year, the number of pets which died before completing its life expectancy, the breed that is most abandoned, etc. The rescue staff can use this information to plan accordingly. They can find the most neglected cases of pets which are usually senior pets, a pet of a particular breed, pets with disability or complex medical condition and using this information they can figure out a way to facilitate their adoption or fostering process. If they find out the most neglected cases which are seldom adopted or fostered, they can try to bring awareness to the desperate situation of these neglected animals by collaborating with social media influencers to promote the adoption of neglected pets, they can give discounts on adoption fees for neglected pets, they can provide paid fostering opportunities in caring for these neglected pets etc.

The VET, CLINIC and APPOINTMENT tables provide details about the veterinary doctors, their clinic details such as its locations and facilities, and the medical appointment details of each pet. The staff can add a new record to the APPOINTMENT table when a sick pet gets treatment from a vet. The staff can also use these tables to get the medical history of the pets which can be given to the potential adopters so that they can choose what is the right pet for them. This is done because some pets will require extensive attention and some adopters might not be able to spend that much time to care for these pets or lack the necessary knowledge about a particular medical condition needed to raise the pet. All these table combined allows querying of details such as the most frequent illness which the pets in the rescue are affected with, the common disease in each breed, the most frequented vet in each specialization, recurring illness in a particular pet, the most common drug recommended etc.

The OWNER, FOSTER and STAFF table provide details of people who will be taking care of the pets. Whenever a person adopts a pet, his detail will be added to the ADOPTION table which links him to the pet, so that the rescue staff can keep track of their pets. The owner table details such as the number of kids he/she has can be used to find a kid-friendly pet for their family. The FOSTER table provides details of the paid or voluntary, past, present, or future fosters. Details such as the medical knowledge and number of free hours per day of the foster can help the rescue staff find a suitable foster pet for them. The ASSIGNMENT table helps the rescue staff keep track of who fosters which pet, how many pets, for how many weeks etc. The STAFF provides details of the rescue staff such as their name, contact details, address, their designation (groomer, caretaker, humane investigator etc), whether they are paid or voluntary workers etc. The details in the FOSTER and ASSIGNMENT table can be used to identify the foster who volunteered the greatest number of days, so that they can be given prizes, as a way of appreciating their effort, dedication, and kindness. It will also encourage others to start fostering animals.

The DONATOR table gives information about different organizations that donates to the rescue. The DONATION table keeps an account of all the donations made to the rescue. It keeps track of the amount of money donated and the date of the donation. The SALARY table is used to maintain information about the payment details of the employees of the animal rescue. The INVOICE table houses the generated bills for all the expenses of the rescue. This includes the veterinary treatment costs of animals, salary of the rescue staff, paid fosters costs, pet foods costs, rent, grooming costs, photographer costs, website maintenance costs, etc. The INVOICE table, together with the DONATION table can be used to see how much of the donations were used up, how much donated money remains, what is the major or common expense, which pet is expensive to raise etc. The INVOICE table together with the DONATION table can be used to audit the expenditure of the rescue business. This can be done to make sure that all portions of the donations are accounted for and that none of the money is being stolen or misused.

In addition to the rescue staff, the public can access the pet details, their breed information, and their medical history. The public also has access to the information regarding the amount of donations the rescue receives each year and the details of these organizations. The Donating Organizations has access to the report with details of the disbursement of the donation money.

**Data Dictionary:**

| TABLE NAME | ATTRIBUTE NAME | CONTENTS | TYPE | FORMAT | RANGE | REQUIRED | PK OR FK | FK REFERENCED TABLE |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PET | PET\_NUM | Pet identification number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| PET\_NAME | Pet name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| BREED\_NUM | Breed id number | CHAR (5) | 99999 | 10000-99999 |  | FK | BREED |
| PET\_DOB | Pet date of birth | DATE | yyyy-mm-dd |  |  |  |  |
| PET\_DOR | Pet date of rescue | DATE | yyyy-mm-dd |  |  |  |  |
| PET\_DOP | Pet date of passing | DATE | yyyy-mm-dd |  |  |  |  |
| BREED | BREED\_NUM | Breed id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| BREED\_NAME | Breed name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| BREED\_TYPE | Breed type | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| BREED\_VERT\_GRP | Breed vertebrate group | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| BREED\_DIET\_CLASS | Breed dietary class | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| BREED\_LIFE\_EXP | Breed life expectancy | INT | 99 |  |  |  |  |
| BREED\_QUALITIES | Breed qualities | VARCHAR (100) | Xxxxxxx |  |  |  |  |
| VET | VET\_NUM | Vet id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| VET\_FNAME | Vet first name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| VET\_LNAME | Vet last name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| VET\_SPECIALIZATION | Vet specialization | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| VET\_BROAD\_CERT | Vet board certification | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| VET\_NUM\_PRACT\_YRS | Vet number of years in practice | INT | 99 | 0-99 |  |  |  |
| VET\_CONTACT\_NUM | Vet contact number | CHAR (12) | 999-999-9999 |  |  |  |  |
| CLI\_NUM | Clinic id number | CHAR (5) | 99999 | 10000-99999 |  | FK | CLINIC |
| VET\_WORK\_HRS | Vet working hours | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| CLINIC | CLI\_NUM | Clinic id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| CLI\_NAME | Clinic name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| CLI\_ADD\_STREET | Clinic street | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| CLI\_ADD\_CITY | Clinic city | VARCHAR (25) | Xxxxxxx |  |  |  |  |
| CLI\_ADD\_STATE | Clinic state | CHAR (2) | XX |  |  |  |  |
| CLI\_ADD\_ZIP | Clinic zip code | CHAR (5) | 99999 |  |  |  |  |
| CLI\_CONTACT\_NUM | Clinic contact number | CHAR (12) | 999-999-9999 |  |  |  |  |
| CLI\_NUM\_VETS | Clinic number of vets | INT | 9999 | 0-9999 |  |  |  |
| CLI\_FACILITIES | Clinic facilities | VARCHAR (100) | Xxxxxxx |  |  |  |  |
| APPOINTMENT | APP\_NUM | Appointment serial number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| APP\_DATE | Appointment date | DATE | yyyy-mm-dd |  | Y |  |  |
| PET\_NUM | Pet id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | PET |
| VET\_NUM | Vet id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | VET |
| APP\_DIAGNOSIS | Appointment diagnosis | VARCHAR (100) | Xxxxxxx |  |  |  |  |
| APP\_PRESCRIPTION | Appointment prescription | VARCHAR (100) | Xxxxxxx |  |  |  |  |
| INV\_NUM | Invoice serial number | CHAR (5) | 99999 | 10000-99999 |  | FK | INVOICE |
| OWNER | OWN\_NUM | Owner id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| OWN\_FNAME | Owner first name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| OWN\_LNAME | Owner last name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| OWN\_CONTACT\_NUM | Owner contact number | CHAR (12) | 999-999-9999 |  |  |  |  |
| OWN\_ADD\_STREET | Owner street | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| OWN\_ADD\_CITY | Owner city | VARCHAR (25) | Xxxxxxx |  |  |  |  |
| OWN\_ADD\_STATE | Owner state | CHAR (2) | XX |  |  |  |  |
| OWN\_ADD\_ZIP | Owner zip code | CHAR (5) | 99999 |  |  |  |  |
| OWN\_PROFESSION | Owner profession | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| OWN\_DOB | Owner date of birth | DATE | yyyy-mm-dd |  |  |  |  |
| OWN\_NUM\_PETS | Number of pets owner has | INT | 99 | 0-99 |  |  |  |
| OWN\_NUM\_KIDS | Number of kids owner has | INT | 99 | 0-99 |  |  |  |
| OWN\_NUM\_FREE\_HRS | Number of free hours per day owner has | INT | 99 | 0-24 |  |  |  |
| FOSTER | FOS\_NUM | Foster id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| FOS\_FNAME | Foster first name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| FOS\_LNAME | Foster last name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| FOS\_CONTACT\_NUM | Foster contact number | CHAR (12) | 999-999-9999 |  |  |  |  |
| FOS\_ADD\_STREET | Foster street | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| FOS \_ADD\_CITY | Foster city | VARCHAR (25) | Xxxxxxx |  |  |  |  |
| FOS \_ADD\_STATE | Foster state | CHAR (2) | XX |  |  |  |  |
| FOS \_ADD\_ZIP | Foster zip code | CHAR (5) | 99999 |  |  |  |  |
| FOS\_PROFESSION | Foster profession | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| FOS\_DOB | Foster date of birth | DATE | yyyy-mm-dd |  |  |  |  |
| FOS\_NUM\_PETS | Number of pets the foster has | INT | 99 | 0-99 |  |  |  |
| FOS\_NUM\_FOS\_PETS | Number of foster pets the foster has | INT | 99 | 0-99 |  |  |  |
| FOS\_NUM\_KIDS | Number of kids foster has | INT | 99 | 0-99 |  |  |  |
| FOS\_MED\_KNOW | Medical knowledge of foster | VARCHAR (100) | Xxxxxxx |  |  |  |  |
| FOS\_NUM\_FREE\_HRS | Number of free hours per day foster has | INT | 99 | 0-24 |  |  |  |
| FOR\_PAID\_VOL | Foster paid or voluntary work | CHAR (1) | X |  |  |  |  |
| STAFF | STF\_NUM | Staff id number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| STF\_FNAME | Staff first name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| STF\_LNAME | Staff last name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| STF \_CONTACT\_NUM | Staff contact number | CHAR (12) | 999-999-9999 |  |  |  |  |
| STF \_ADD\_STREET | Staff street | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| STF \_ADD\_CITY | Staff city | VARCHAR (25) | Xxxxxxx |  |  |  |  |
| STF \_ADD\_STATE | Staff state | CHAR (2) | XX |  |  |  |  |
| STF \_ADD\_ZIP | Staff zip code | CHAR (5) | 99999 |  |  |  |  |
| STF\_DOB | Staff date of birth | DATE | yyyy-mm-dd |  |  |  |  |
| STF\_DESIGNATION | Staff designation | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| STF\_PAID\_VOL | Staff paid or voluntary | CHAR (1) | X |  |  |  |  |
| ADOPTION | ADOP\_NUM | Adoption number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| ADOP\_DATE | Adoption date | DATE | yyyy-mm-dd |  | Y |  |  |
| PET\_NUM | Pet id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | PET |
| OWN\_NUM | Owner id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | OWNER |
| ADOP\_FEE | Adoption fee | NUMERIC (6,2) | 9999.99 | 0-999.99 |  |  |  |
| ASSIGNMENT | ASSI\_NUM | Assignment serial number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| ASSI\_DATE | Assignment date | DATE | yyyy-mm-dd |  | Y |  |  |
| PET\_NUM | Pet id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | PET |
| FOS\_NUM | Foster id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | FOSTER |
| ASSI\_FUND | Assignment fund | NUMERIC (6,2) | 9999.99 | 0-999.99 |  |  |  |
| ASSI\_NUM\_DAYS | Assignment number of days | INT | 999 | 0-999 |  |  |  |
| INV\_NUM | Invoice serial number | CHAR (5) | 99999 | 10000-99999 |  | FK | INVOICE |
| DONATOR | DNR\_NUM | Donator number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| DNR\_ORG\_NAME | Donator organization name | VARCHAR (40) | Xxxxxxx |  | Y |  |  |
| DNR\_DIRECTOR | Donator director name | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| DNR\_LIASION | Donator liaison | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| DNR\_CONTACT\_NUM | Contact number of donator | CHAR (12) | 999-999-9999 |  |  |  |  |
| DNR \_ADD\_STREET | Donator street | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| DNR \_ADD\_CITY | Donator city | VARCHAR (25) | Xxxxxxx |  |  |  |  |
| DNR \_ADD\_STATE | Donator state | CHAR (2) | XX |  |  |  |  |
| DNR \_ADD\_ZIP | Staff zip code | CHAR (5) | 99999 |  |  |  |  |
| DNR\_DOF | Donator date of founding | DATE | yyyy-mm-dd |  |  |  |  |
| DNR\_NUM\_RUN\_YRS | Donator number of years running | INT | 999 | 0-999 |  |  |  |
| DONATION | DON\_NUM | Donation serial number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| DON\_DATE | Donation date | DATE | yyyy-mm-dd |  | Y |  |  |
| DNR\_NUM | Donator id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | DONATOR |
| DON\_AMOUNT | Donation amount | NUMERIC (6,2) | 9999.99 | 0-99999.999 |  |  |  |
| INVOICE | INV\_NUM | Invoice serial number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| INV\_DATE | Invoice date | DATE | yyyy-mm-dd |  | Y |  |  |
| INV\_AMOUNT | Invoice amount | NUMERIC (6,2) | 9999.99 | 0-999.999 |  |  |  |
| DON\_NUM | Donation serial number | CHAR (5) | 99999 | 10000-99999 |  | FK | DONATION |
| INV\_REASON | Invoice reason | VARCHAR (40) | Xxxxxxx |  |  |  |  |
| SALARY | SAL\_NUM | Salary serial number | CHAR (5) | 99999 | 10000-99999 | Y | PK |  |
| SAL\_DATE | Salary date | DATE | yyyy-mm-dd |  | Y |  |  |
| STF\_NUM | Staff id number | CHAR (5) | 99999 | 10000-99999 | Y | FK | STAFF |
| SAL\_AMOUNT | Salary amount | NUMERIC (6,2) | 9999.99 | 0-9999.999 |  |  |  |
| SAL\_NUM\_WORK\_HRS | Salary number of hours worked | INT | 999 | 0-999 |  |  |  |
| INV\_NUM | Invoice serial number | CHAR (5) | 99999 | 10000-99999 | Y | FK | INVOICE |

**Business rules:**

1. One breed has zero or many pets. One pet belongs to one and only one breed.
2. One owner adopts zero or many pets. One pet is adopted by zero or many owners
3. One foster raises zero or many pets. One pet is raised by zero or many fosters
4. One clinic employs zero or many vets. One vet is employed by one and only one clinic
5. One vet treats zero or many pets. One pet is treated by zero or many vets.
6. One donator donates zero or many donations. One donation is donated by one and only one donator.
7. One donation is used by zero or many invoice. One invoice uses one and only one donation.
8. One appointment generates one and only one invoice. One invoice is generated by one and only one appointment
9. One assignment produces one and only one invoice. One invoice is produced by one and only one assignment.
10. One salary creates one and only one invoice. One invoice is created by one and only one salary.
11. One staff earns zero or many salaries. One salary is earned by one and only one staff.

**Entity Relationship Model (ERM) Components:**

| ENTITY | RELATIONSHIP | CONNECTIVITY | ENTITY |
| --- | --- | --- | --- |
| BREED | has | 1:M | PET |
| OWNER | adopts | M:N | PET |
| FOSTER | raises | M:N | PET |
| CLINIC | employs | 1:M | VET |
| VET | treats | M:N | PET |
| DONATOR | donates | 1:M | DONATION |
| DONATION | used by | 1:M | INVOICE |
| APPOINTMENT | generates | 1:1 | INVOICE |
| ASSIGNMENT | produces | 1:1 | INVOICE |
| SALARY | creates | 1:1 | INVOICE |
| STAFF | earns | 1:M | SALARY |

**Part 2: Entity Relationship Diagram**

1. **RELATIONAL SCHEMA**
2. PET (**PET\_NUM**, PET\_NAME, PET\_DOB, PET\_DOR, PET\_DOP, BREED\_NUM)
3. BREED (**BREED\_NUM**, BREED\_NAME, BREED\_TYPE, BREED\_VERT\_GRP, BREED\_DIET\_CLASS, BREED\_LIFE\_EXP, BREED\_QUALITIES)
4. VET (**VET\_NUM**, VET\_FNAME, VET\_LNAME, VET\_SPECIALIZATION, VET\_BROAD\_CERT, VET\_NUM\_PRACT\_YRS, VET\_CONTACT\_NUM, VET\_WORK\_HRS, CLI\_NUM)
5. CLINIC (**CLI\_NUM**, CLI\_NAME, CLI\_ADD\_STREET, CLI\_ADD\_CITY, CLI\_ADD\_STATE, CLI\_ADD\_ZIP, CLI\_CONTACT\_NUM, CLI\_NUM\_VETS, CLI\_FACILITIES)
6. APPOINTMENT (**APP\_NUM**, APP\_DATE, APP\_DIAGNOSIS, APP\_PRESCRIPTION, PET\_NUM, VET\_NUM, INV\_NUM)
7. OWNER (**OWN\_NUM**, OWN\_FNAME, OWN\_LNAME, OWN\_CONTACT\_NUM, OWN\_ADD\_STREET, OWN\_ADD\_CITY, OWN\_ADD\_STATE, OWN\_ADD\_ZIP, OWN\_PROFESSION, OWN\_DOB, OWN\_NUM\_PETS, OWN\_NUM\_KIDS, OWN\_NUM\_FREE\_HRS)
8. FOSTER (**FOS\_NUM**, FOS\_FNAME, FOS\_LNAME, FOS\_CONTACT\_NUM, FOS\_ADD\_STREET, FOS \_ADD\_CITY, FOS \_ADD\_STATE, FOS \_ADD\_ZIP, FOS\_PROFESSION, FOS\_DOB, FOS\_NUM\_PETS, FOS\_NUM\_FOS\_PETS, FOS\_NUM\_KIDS, FOS\_MED\_KNOW, FOS\_NUM\_FREE\_HRS, FOR\_PAID\_VOL)
9. STAFF (**STF\_NUM**, STF\_FNAME, STF\_LNAME, STF \_CONTACT\_NUM, STF \_ADD\_STREET, STF \_ADD\_CITY, STF \_ADD\_STATE, STF \_ADD\_ZIP, STF\_DOB, STF\_DESIGNATION, STF\_PAID\_VOL)
10. ADOPTION (**ADOP\_NUM**, ADOP\_DATE, ADOP\_FEE, PET\_NUM, OWN\_NUM)
11. ASSIGNMENT (**ASSI\_NUM**, ASSI\_DATE, ASSI\_FUND, ASSI\_NUM\_DAYS, PET\_NUM, FOS\_NUM, INV\_NUM)
12. DONATOR (**DNR\_NUM**, DNR\_ORG\_NAME, DNR\_DIRECTOR, DNR\_LIASION, DNR\_CONTACT\_NUM, DNR \_ADD\_STREET, DNR \_ADD\_CITY, DNR \_ADD\_STATE, DNR \_ADD\_ZIP, DNR\_DOF, DNR\_NUM\_RUN\_YRS)
13. DONATION (**DON\_NUM**, DON\_DATE, DON\_AMOUNT, DNR\_NUM)
14. INVOICE (**INV\_NUM**, INV\_DATE, INV\_AMOUNT, INV\_REASON, DON\_NUM)
15. SALARY (**SAL\_NUM**, SAL\_DATE, SAL\_AMOUNT, SAL\_NUM\_WORK\_HRS, STF\_NUM, INV\_NUM)
16. **ENTITY RELATIONSHIP DIAGRAM USING CROW’S FOOT NOTATION**

Graphical user interface, application, Teams

Description automatically generated

1. **SUPERTYPE-SUBTYPE DIAGRAM USING CROW’S FOOT NOTATION**

Graphical user interface, application

Description automatically generated

1. **NORMALIZATION**

Normalization is the process in which the data in the database is organized in such a way that data redundancy, data inconsistency and data anomalies (insertion, deletion, and update anomalies) are reduced or eliminated, and data integrity is maintained. A table can be in different normal forms such as 1NF, 2NF, 3NF etc. Let us breakdown the process of converting the RESCUE table from 1NF to 3NF. The rescue table in 1NF will be split into 3 tables - APPOINTMENT, PET and VET to normalize it to 3NF.

**First Normal Form**

The table is in 1NF if:

* It has a primary key
* It has no repeating groups
* It has single valued attributes only

The RESCUE table has primary key RESC\_APP\_NUM, which can be used to uniquely identify a record in the table. It has no repeating groups, and it has single valued attributes only, thus making it a table in 1NF.

The RESCUE table has no partial dependency, as no non-prime attribute depends on a subset of the primary key.

The RESCUE table has 2 transitive dependencies. Transitive dependency is created when a non-prime attribute depends on another non-prime attributes in the table.

* Here, the following attributes - RESC\_PET\_NAME, BREED\_NUM, RESC\_PET\_DOB, RESC\_PET\_DOR and RESC\_PET\_DOP depend on the non-prime attribute RESC\_PET\_NUM.
* And the following attributes - RESC\_VET\_FNAME, RESC\_VET\_LNAME, RESC\_VET\_SPECIALIZATION, RESC\_VET\_BROAD\_CERT, RESC\_VET\_NUM\_PRACT\_YRS, RESC\_VET\_CONTACT\_NUM, CLI\_NUM, RESC\_VET\_WORK\_HRS depend on the non-prime attribute RESC\_VET\_NUM.

**Relational Schema**

RESCUE (**RESC\_APP\_NUM**, RESC\_APP\_DATE, RESC\_APP\_DIAGNOSIS, RESC\_APP\_PRESCRIPTION, INV\_NUM, RESC\_PET\_NUM, RESC\_PET\_NAME, BREED\_NUM, RESC\_PET\_DOB, RESC\_PET\_DOR, RESC\_PET\_DOP, RESC\_VET\_NUM, RESC\_VET\_FNAME, RESC\_VET\_LNAME, RESC\_VET\_SPECIALIZATION, RESC\_VET\_BROAD\_CERT, RESC\_VET\_NUM\_PRACT\_YRS, RESC\_VET\_CONTACT\_NUM, CLI\_NUM, RESC\_VET\_WORK\_HRS)

**Partial Dependencies**

There are no partial dependencies in the table.

**Transitive Dependencies**

(RESC\_PET\_NUM -> RESC\_PET\_NAME, BREED\_NUM, RESC\_PET\_DOB, RESC\_PET\_DOR, RESC\_PET\_DOP)

(RESC\_VET\_NUM -> RESC\_VET\_FNAME, RESC\_VET\_LNAME, RESC\_VET\_SPECIALIZATION, RESC\_VET\_BROAD\_CERT, RESC\_VET\_NUM\_PRACT\_YRS, RESC\_VET\_CONTACT\_NUM, CLI\_NUM, RESC\_VET\_WORK\_HRS)

**Dependency Diagram**



**Second Normal Form**

The table is in 2NF if:

* It is already in 1NF
* It has no partial dependencies

The second normal form (2NF) for this table is the same as the first normal form 1NF, because the RESCUE table is already in 1NF, and it has no partial dependencies.

**Relational Schema**

RESCUE (**RESC\_APP\_NUM**, RESC\_APP\_DATE, RESC\_APP\_DIAGNOSIS, RESC\_APP\_PRESCRIPTION, INV\_NUM, RESC\_PET\_NUM, RESC\_PET\_NAME, BREED\_NUM, RESC\_PET\_DOB, RESC\_PET\_DOR, RESC\_PET\_DOP, RESC\_VET\_NUM, RESC\_VET\_FNAME, RESC\_VET\_LNAME, RESC\_VET\_SPECIALIZATION, RESC\_VET\_BROAD\_CERT, RESC\_VET\_NUM\_PRACT\_YRS, RESC\_VET\_CONTACT\_NUM, CLI\_NUM, RESC\_VET\_WORK\_HRS)

**Transitive Dependencies**

(RESC\_PET\_NUM -> RESC\_PET\_NAME, BREED\_NUM, RESC\_PET\_DOB, RESC\_PET\_DOR, RESC\_PET\_DOP)

(RESC\_VET\_NUM -> RESC\_VET\_FNAME, RESC\_VET\_LNAME, RESC\_VET\_SPECIALIZATION, RESC\_VET\_BROAD\_CERT, RESC\_VET\_NUM\_PRACT\_YRS, RESC\_VET\_CONTACT\_NUM, CLI\_NUM, RESC\_VET\_WORK\_HRS)

**Dependency Diagram**



**Third Normal Form**

The table is in 3NF if:

* It is already in 2NF
* It has no transitive dependencies in the table

The RESCUE is already in 2NF. By removing the transitive dependencies in it, we will be able to normalize it to 3NF.

To achieve this, the RESCUE table is broken down into the 3 different tables - APPOINTMENT, PET and VET. This will eliminate the transitive dependencies in it and the table will be in 3NF.

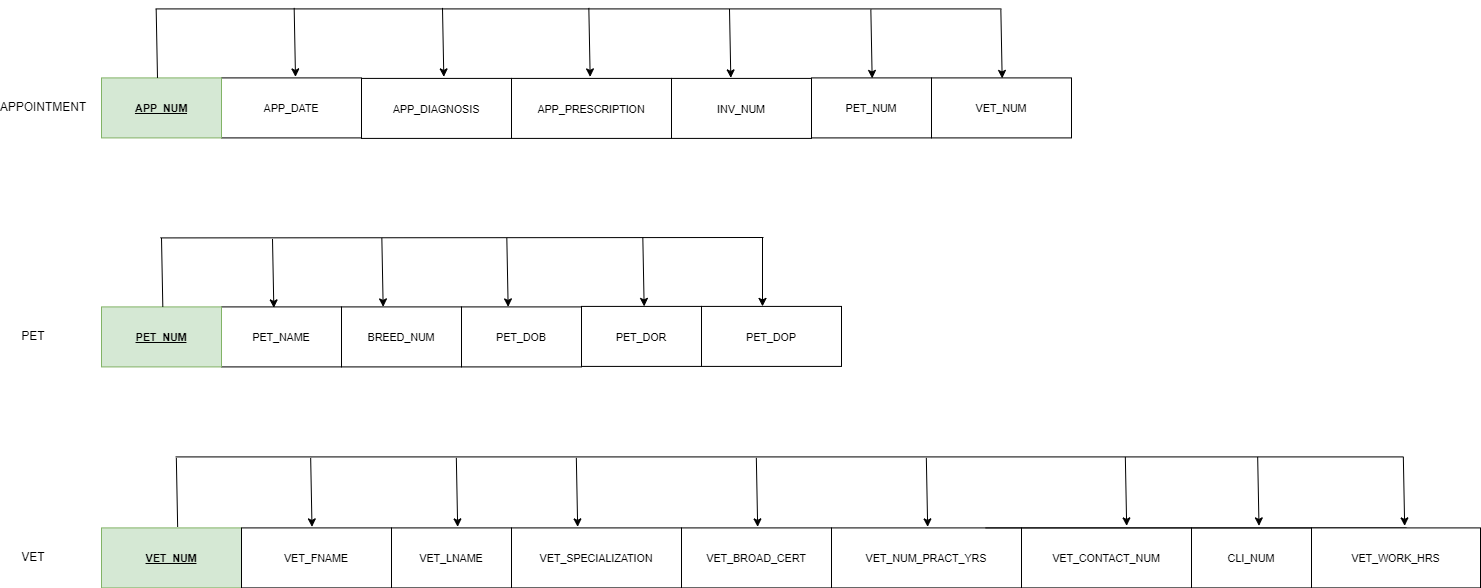
**Relational Schema**

APPOINTMENT (**APP\_NUM**, APP\_DATE, APP\_DIAGNOSIS, APP\_PRESCRIPTION, INV\_NUM, PET\_NUM, VET\_NUM)

PET (**PET\_NUM**, PET\_NAME, BREED\_NUM, PET\_DOB, PET\_DOR, PET\_DOP)

VET (**VET\_NUM**, VET\_FNAME, VET\_LNAME, VET\_SPECIALIZATION, VET\_BROAD\_CERT, VET\_NUM\_PRACT\_YRS, VET\_CONTACT\_NUM, CLI\_NUM, VET\_WORK\_HRS)

**Dependency Diagram**



The process of normalizing the RESCUE table in 1NF to APPOINTMENT, PET and VET tables in 3NF have been explained.

**Part 3: Database**

**Questions and their SQL Queries:**

***A query that pulls data from one table***

1. How many numbers of pets are rescued in the year 2021 by the animal rescue?

SELECT COUNT(\*) AS 'Number of pets rescued in 2021'

FROM PET

WHERE YEAR(PET\_DOR) = 2021;

***A query that pulls data from two tables***

1. What are the names of Golden Retriever dogs rescued by the animal rescue?

SELECT PET\_NAME

FROM PET INNER JOIN BREED

ON PET.BREED\_NUM = BREED.BREED\_NUM

WHERE BREED.BREED\_NAME = 'Golden Retriever';

***A query that also includes a subquery***

1. What are the names of the oldest pets rescued by the animal rescue?

SELECT PET\_NAME

FROM PET

WHERE PET\_DOB = (SELECT MIN(PET\_DOB) FROM PET);