#### Animal Shelter Description

Chris got the idea for this database after volunteering at an animal shelter: he said their system for keeping track of the animals was an inefficient mess.

The main entities in our model are **animals** such as cats and dogs, **owners** who may adopt these animals, the **workers** who we split further into **volunteers** and **veterinarians**, and the **shelters** themselves, which may have different sections within them housing specific animals, **wards**. To add some more complexity to our model we further added **intake forms**, which track when an animal is taken in by a shelter, **adoption applications** made by owners for specific animals, tracking the date an animal is adopted by a specific owner, and pet **food** with different brand and price attributes. To normalize our model into 3NF we removed City and Province as attributes from both Shelters and Owners, with Postal Code as a foreign key accessing these attributes in **postal code** as a new entity. Our model tracks the age and weight of the animals kept at shelters, how long they've been there for, if and when they are adopted and by who, and the variety and quantity of food they are fed. It also tracks the annual budget of each shelter, the salaries of its veterinarians, and the hours logged by its volunteers.

#### **Changes to Relational Schema:**

We forgot to give a name to the new relations born of normalizing Shelter and Owner to 3NF. We elected to call these relations PostalCode, and, being the exact same thing, have them as one single relation, tied to bother Shelter and Owner.

Small changes to the names of tables and columns were made to be compatible with SQL: words were added to reserved words, spaces and symbols were removed.

We added Animal's primary key (ID, Species) to IntakeForm as a foreign key, in order to enforce a one-to-one relationship.

#### **Queries:**

**Insert:** Adds an Adoption Application for a particular Owner seeking to adopt a particular Animal. Owner and Animal must already exist within the database. Postal code must not have a space in it.

**Select:** Select tuples from any table for any two given specified attributes. String values must be surrounded by single quotes, date values must follow SQL date format: date 'YYYY-MM-DD'. Both values must be specified.

**Update:** Updates the number of volunteer hours for a given volunteer. The user must input the volunteer worker's ID and the number of hours to update to.

**Delete:** Removes a worker from the database, in case they no longer work for the animal shelter. Removing a worker from the worker database will update the volunteer or veterinarian table accordingly.

**Join:** The user inputs a city, and then the database responds with information about all the animals in that city. This is done by joining the PostalCode table with the Animal table on the PostalCode and checking that the user inputted city matches the one listed in the PostalCode table.

**Aggregation Group By:** This query is hardcoded to count the number of dogs in the database. The user clicks a button, and then the number of dogs is counted by checking species='Dog' in the animal table.

**Projection:** The user is allowed to select any 1-5 attributes from the animal table to project on, allowing them to display specific information for animals within the shelter that may be useful at any given time such as wardnumber, species, breed, birthday, etc.

### Sample Outputs

### Insert:

| SQL> select * from adoptionapplic | cation;      |            |        |           |
|-----------------------------------|--------------|------------|--------|-----------|
| OWNERNAME                         | STREETNUMBER | STREETNAME | POSTAL | ADOPTIOND |
| AID SPECIES                       |              |            |        |           |
| Haris Barbara<br>87047410 Dog     | 123          | Vine St    | V6S1L5 | 15-0CT-21 |
| Aygul Antinanco<br>78217232 Cat   | 5212         | Cedar St   | V2R9Y7 | 25-SEP-21 |
| Medusa Karol<br>61558339 Dog      | 2345         | Oak Ave    | V7H2R9 | 11-AUG-21 |
| OWNERNAME                         | STREETNUMBER | STREETNAME | POSTAL | ADOPTIOND |
| AID SPECIES                       |              |            |        |           |
| Kanako Ana<br>50276739 Dog        | 1456         | Maple Ave  | V8LH94 | 09-0CT-21 |
| Olamide Gayathri<br>13015895 Cat  | 3465         | Yew St     | V9Z1B6 | 18-0CT-21 |
| SQL>                              |              |            |        |           |

Five adoption applications from initialization

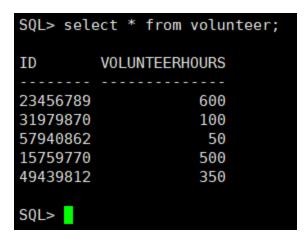
| Reset                       | Adopt An Animal!          |
|-----------------------------|---------------------------|
| Insert Adoption Application | Your Name: Haris Barbara  |
| Find Animals in City        | Your Street Number: 123   |
| Count Dogs                  |                           |
| Update Volunteer Hours      | Your Street Name: Vine St |
| Delete Worker               | Your Postal Code: V6S1L5  |
| Find Food Amount            | Adoption Date: 2021-11-28 |
| Display Animal Info         |                           |
| Custom Selection            | Animal's ID 00000000      |
|                             | Species: Dog              |
|                             | Insert                    |

insert a new adoption application for Dog 00000000 by Haris Barbara

| SQL> select * from               | adoptionapplication; |            |        |           |
|----------------------------------|----------------------|------------|--------|-----------|
| OWNERNAME                        | STREETNUMBER         | STREETNAME | POSTAL | ADOPTIOND |
| AID SPECIES                      |                      |            |        |           |
| Haris Barbara<br>00000000 Dog    | 123                  | Vine St    | V6S1L5 | 28-N0V-21 |
| Haris Barbara<br>87047410 Dog    | 123                  | Vine St    | V6S1L5 | 15-0CT-21 |
| Aygul Antinanco<br>78217232 Cat  | 5212                 | Cedar St   | V2R9Y7 | 25-SEP-21 |
| OWNERNAME                        | STREETNUMBER         | STREETNAME | POSTAL | ADOPTIOND |
| AID SPECIES                      |                      |            |        |           |
| Medusa Karol<br>61558339 Dog     | 2345                 | Oak Ave    | V7H2R9 | 11-AUG-21 |
| Kanako Ana<br>50276739 Dog       | 1456                 | Maple Ave  | V8LH94 | 09-0CT-21 |
| Olamide Gayathri<br>13015895 Cat | 3465                 | Yew St     | V9Z1B6 | 18-0CT-21 |
| 6 rows selected.                 |                      |            |        |           |
| SQL>                             |                      |            |        |           |

new adoption application is in database

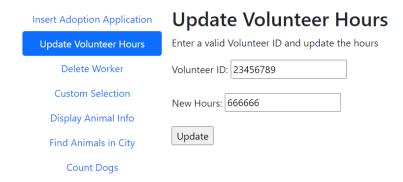
#### Update:



Volunteer 23456789 has 600 volunteer hours

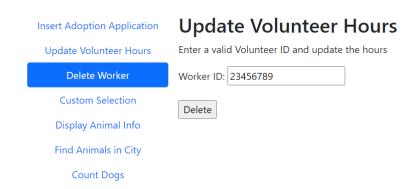
← → C 🍵 students.cs.ubc.ca/~dnsrkn/animal-shelter.php

# **Animal Shelter Databse**



| SQL> select | * from volunteer; |
|-------------|-------------------|
| ID VO       | LUNTEERHOURS      |
|             |                   |
| 23456789    | 600               |
| 31979870    | 100               |
| 57940862    | 50                |
| 15759770    | 500               |
| 49439812    | 350               |
|             | * from volunteer; |
| ID VC       | LUNTEERHOURS      |
|             |                   |
| 23456789    | 666666            |
| 31979870    | 100               |
| 57940862    | 50                |
| 15759770    | 500               |
| 49439812    | 350               |
| S0L>        |                   |

Update their hours to 666666



Volunteer 23456789 was able to work an extra 76 years without us realizing; he is too powerful and must be destroyed. He is removed from both the worker and volunteer tables through cascading

```
SQL> select * from volunteer;
ID
          VOLUNTEERHOURS
23456789
                  666666
31979870
                     100
                      50
57940862
15759770
                     500
49439812
                     350
SQL> select * from volunteer;
ID
         VOLUNTEERHOURS
31979870
                     100
57940862
                      50
                     500
15759770
49439812
                     350
SQL>
```

```
SQL> select * from worker where id='23456789';
no rows selected

SQL>
```

| Insert Adoption Application | <b>Custom Selection</b>         |
|-----------------------------|---------------------------------|
| Update Volunteer Hours      | Table Name: adoptionapplication |
| Delete Worker               | Attribute 1: ownername          |
| Custom Selection            |                                 |
| Display Animal Info         | Value 1: Haris Barbara'         |
| Find Animals in City        | Attribute 2: streetnumber       |
| Count Dogs                  | Value 2: 123                    |
|                             | Select                          |

#### let's see what adoptions Haris Barbara has applied for

🗲 🗦  $\mathbf{C}'$  🏟 students.cs.ubc.ca/~dnsrkn/animal-shelter.php?displaySpecificRequest=&table\_name=adoptionapplication&field1=ownername&var1=%27Haris+Barbara%27&fieldi

### **Animal Shelter Databse**



Retrieved data from table [table name here?]:

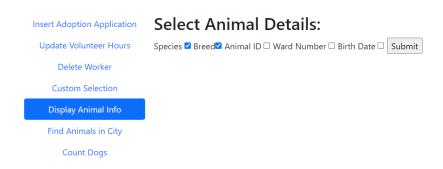
OWNERNAME: Haris Barbara | STREETNUMBER: 123 | STREETNAME: Vine St | POSTALCODE: V6S1L5 | ADOPTIONDATE: 28-NOV-21 | AID: 00000000 | SPECIES: Dog | OWNERNAME: Haris Barbara | STREETNUMBER: 123 | STREETNAME: Vine St | POSTALCODE: V6S1L5 | ADOPTIONDATE: 15-OCT-21 | AID: 87047410 | SPECIES: Dog |

The dog he's previously had as well as the one he adopted with our insert gui, as can be seen in the initial screenshots.

#### Projection:

 $\textbf{ students.cs.ubc.ca} / \sim dnsrkn/animal-shelter.php? displayProjectAnimalRequest = \&project\_animal\%5B\%5D = Species\&project\_animal\%5B\%5D = Species\&project\_animal\%5B\%5D = Species\&projectAnimal = Substantial S$ 

#### **Animal Shelter Databse**



Retrieved data from table:

SPECIES: Dog | BREED: Golden Retriever |

SPECIES: Cat | BREED: Maine Coon |

SPECIES: Dog | BREED: Boston Terrier |

SPECIES: Dog | BREED: Pug |

SPECIES: Cat | BREED: Siamese |

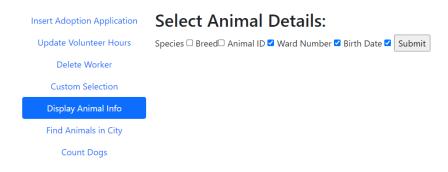
SPECIES: Cat | BREED: Persian |

SPECIES: Dog | BREED: Mutt |

SPECIES: Dog | BREED: Mutt |

🗧 ightarrow C 🐞 students.cs.ubc.ca/~dnsrkn/animal-shelter.php?displayProjectAnimalRequest=&project\_animal%5B%5D=ID&project\_animal%5B%5D=WardNumber&projec

### **Animal Shelter Databse**



#### Retrieved data from table:

ID: 87047410 | WARDNUMBER: 4 | BIRTHDATE: 25-OCT-20 | ID: 78217232 | WARDNUMBER: 3 | BIRTHDATE: 21-MAY-13 |

ID: 61558339 | WARDNUMBER: 4 | BIRTHDATE: 30-JAN-16 |

ID: 50276739 | WARDNUMBER: 6 | BIRTHDATE: 23-APR-21 |

ID: 13015895 | WARDNUMBER: 3 | BIRTHDATE: 11-AUG-19 |

ID: 00000001 | WARDNUMBER: 3 | BIRTHDATE: 01-JAN-19 |

ID: 00000001 | WARDNUMBER: 6 | BIRTHDATE: 23-FEB-21 |

ID: 00000000 | WARDNUMBER: 6 | BIRTHDATE: 23-FEB-01 |

|   | Insert Adoption Application  Update Volunteer Hours  Delete Worker  Custom Selection | Find animals in a given city  City: Vancouver  Submit |
|---|--|---|
|   | Display Animal Info  |   |
|   | Find Animals in City   |   |
|   | Count Dogs   |   |
| Retrieved data from table: ID: 87047410   SPECIES: Dog   BREED: Golden Retriever ID: 61558339   SPECIES: Dog   BREED: Boston Terrier   ID: 50276739   SPECIES: Dog   BREED: Pug   ID: 00000001   SPECIES: Dog   BREED: Mutt   ID: 00000000   SPECIES: Dog   BREED: Mutt | I  |   |

# **Animal Shelter Databse**

| Insert Adoption Application | Find animals in a given city |
|-----------------------------|------------------------------|
| Update Volunteer Hours      | City: Surrey                 |
| Delete Worker               | Submit                       |
| Custom Selection            |                              |
| Display Animal Info         |                              |
| Find Animals in City        |                              |
| Count Dogs                  |                              |

Retrieved data from table:

ID: 78217232 | SPECIES: Cat | BREED: Maine Coon | ID: 13015895 | SPECIES: Cat | BREED: Siamese | ID: 00000001 | SPECIES: Cat | BREED: Persian |



The dog of tuples in Animal: 5