CS 340 README

About the Project
This project implements a MongoDB CRUD (Create, Read, Update, Delete) module in Python, following the industry's best practices for database operations. There is an included Python script that implements Create and Read functions with demonstrations provided via screenshots. The project ensures user authentication and securely imports CSV data using MongoDB tools.

Motivation
This software application will work with existing data from animal shelters to identify and categorize available dogs for search-and-rescue training. When trained, these dogs can find and help to rescue humans or other animals, often in life-threatening conditions. To help identify dogs for training, Global Rain will use data from animal shelters.

Getting Started
Install Python3, the programming language being used by our module.
Install Python modules pymongo, the module used by the database to interact with our module.
Install Jupyter Notebook, the http server running commands and capable of saving sessions to share with fellow engineers or co-workers.

Optional:
Install VIM
Install NotePad++

Start your Jupyter notebook, then import AnimalShelter class.
You can add documents to the database as long as they are in key-value pairs.
Using the AnimalShelter class you can read data as you can pass a key-value pair to search for!
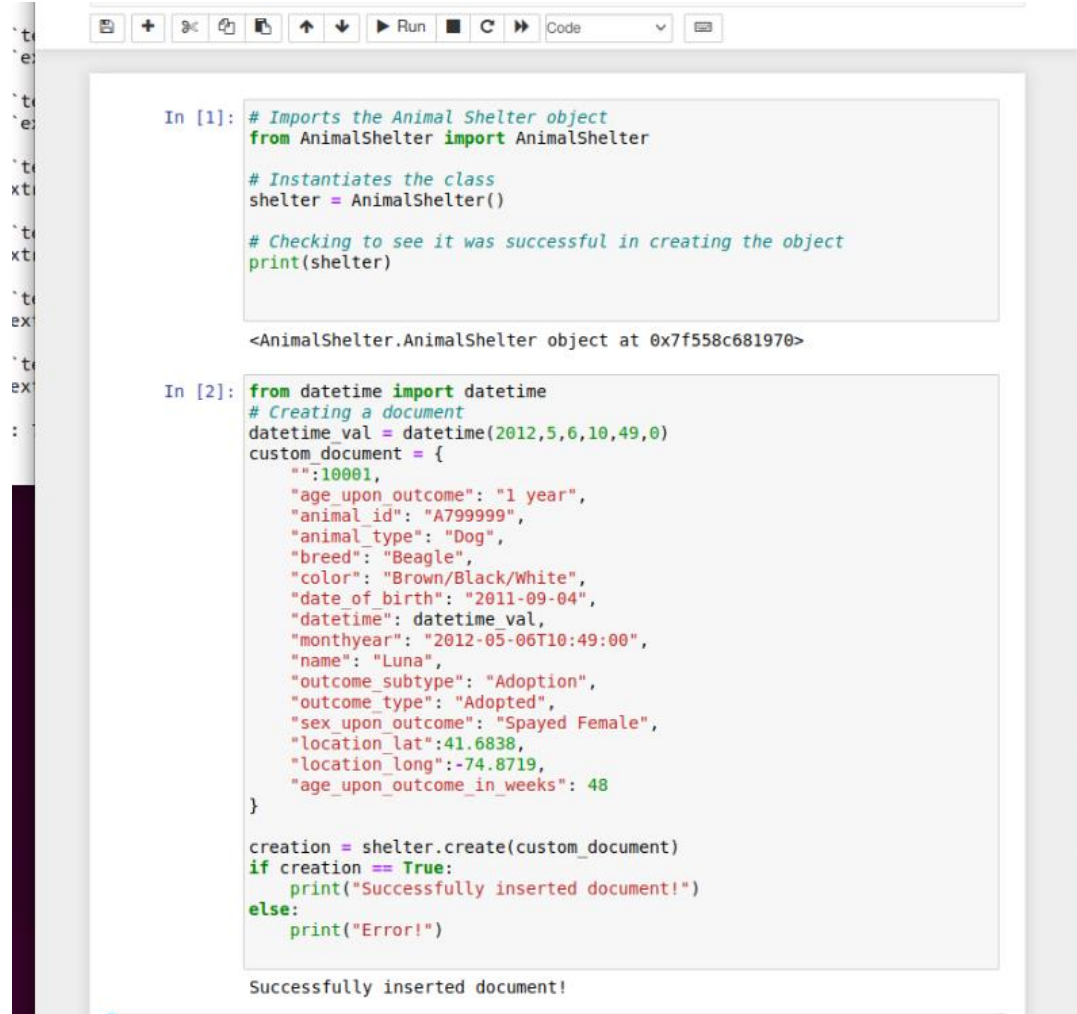
Installation
Software required MongoDB, for database loading, creation and searching. The Python programming language libraries and interpreter. The Jupyter Notebook will help to run and import the python module created by Global Rain to analyze the data by either creating a new document within the animal's collection or reading a document from the database.

Usage
Using the Jupyter Notebook screenshots.

Code Example


```python
In [1]:  # Imports the Animal Shelter object
         from AnimalShelter import AnimalShelter

         # Instantiates the class
         shelter = AnimalShelter()

         # Checking to see it was successful in creating the object
         print(shelter)

         <AnimalShelter.AnimalShelter object at 0x7f558c681970>
```

```python
In [2]:  from datetime import datetime
         # Creating a document
         datetime_val = datetime(2012,5,6,10,49,0)
         custom_document = {
             "":10001,
             "age_upon_outcome": "1 year",
             "animal_id": "A799999",
             "animal_type": "Dog",
             "breed": "Beagle",
             "color": "Brown/Black/White",
             "date_of_birth": "2011-09-04",
             "datetime": datetime_val,
             "monthyear": "2012-05-06T10:49:00",
             "name": "Luna",
             "outcome_subtype": "Adoption",
             "outcome_type": "Adopted",
             "sex_upon_outcome": "Spayed Female",
             "location_lat":41.6838,
             "location_long":-74.8719,
             "age_upon_outcome_in_weeks": 48
         }

         creation = shelter.create(custom_document)
         if creation == True:
             print("Successfully inserted document!")
         else:
             print("Error!")

         Successfully inserted document!
```

Tests
This screenshot provides a blueprint for running our Animal Shelter.

Extended Usage
The next few screen shots show extendable functionality added, using a dashboard with visible and dynamic charts that adjust according to the data filters applied. Creates interactive options that allow for the selection of data based on filtering functions and the control of other dashboard widgets, and demonstrates successful executions by providing screenshots with a unique identifier.

For this specific project we have water, disaster, mountain, and the entire list of animals at the shelter from which you can choose for a project. These rescue and search animals have listed up to eleven different attributes that allows seekers of this type of animal to assist in rescue or search missions with recommendations aligned to the animal's abilities.

Installation

The required software updates from the python package installer:
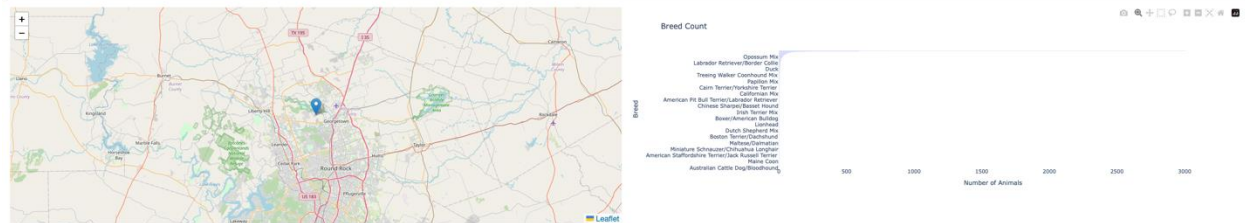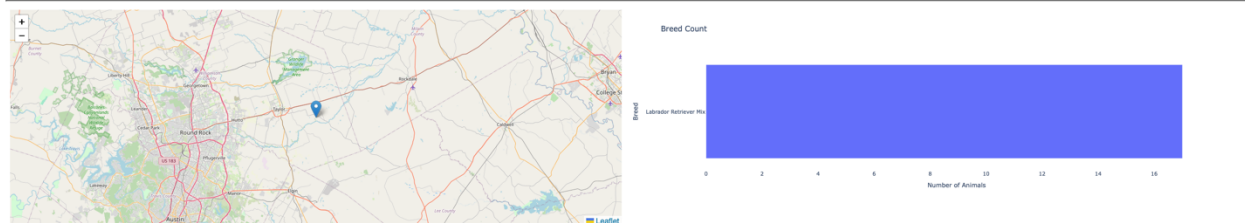
Dash (installed using 'pip install dash')

Pymongo (installed using 'pip install pymongo')

Numpy (installed as, 'pip install numpy')

Pandas Library (installed as, 'pip install pandas')

Mathematical Plot Library (installed as 'pip install matplotlib')

These libraries were used together to put the dashboard together, where we used the matplotlib python library to create the chart that dynamically updates according to the filtered animals list that gets uploaded all at once. The animals list is not tiny, but 10k documents is easy enough for many computers or PC's in 2025. Dash uses html to create and run a server capable of serving HTML pages, designed within the Jupyter notebook. The reason for creating this dashboard is that we can look at where the animals are located and also filter the results from such a large list easily using a few clicks. Much easier than typing code into a notebook and running it and potentially showing errors. This dashboard is created once but updated whenever animals are added to the database by reloading the database every time you run the app. By selecting the clear output sub-menu item and re-running the notebook through what is called a, 'kernel restart' which enables you to reload your data and analyze it visually.
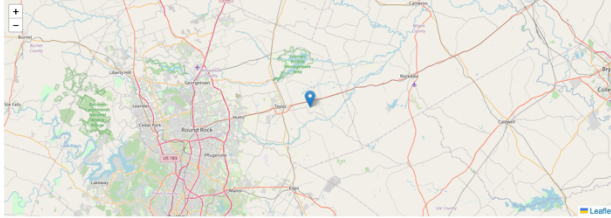
Animal Search and Rescue Dashboard

Water Rescue
Mountain Rescue
Disaster Rescue
Reset

	age_upon_outcome	animal_id	animal_type	breed	color	date_of_birth	datetime	monthyear	name	outcome_subtype	outcome_type	sex_upon_outcome	location_lat	location_long	age_upon_outcome_in_weeks
2	1 year	A725717	Cat	Domestic Shorthair Mix	Silver Tabby	2015-05-02	2016-05-06 10:49:00	2016-05-06T10:49:00		SCRP	Transfer	Spayed Female	30.6525984560228	-97.7419963476444	52.9215277777778
1	3 years	A746874	Cat	Domestic Shorthair Mix	Black/White	2014-04-10	2017-04-11 09:00:00	2017-04-11T09:00:00		SCRP	Transfer	Neutered Male	30.5066578739455	-97.3408780722188	156.767857142857
9	3 years	A720214	Dog	Labrador Retriever Mix	Red/White	2013-02-04	2016-02-11 12:41:00	2016-02-11T12:41:00	Blessing		Adoption	Spayed Female	30.3870648199411	-97.3684339731375	157.504067460317
10	3 months	A664290	Cat	Domestic Shorthair Mix	Tortie	2013-09-01	2013-12-08 14:58:00	2013-12-08T14:58:00	*Taylor		Adoption	Spayed Female	30.7583105481048	-97.618292198845	14.0890873015873
11	1 year	A721199	Dog	Dachshund Wirehair Mix	Tan/White	2015-02-23	2016-02-27 17:49:00	2016-02-27T17:49:00	Belle		Adoption	Spayed Female	30.7290272761146	-97.3753328216134	52.8203373015873
12	1 year	A664843	Dog	Pit Bull Mix	Brown/White	2013-06-09	2014-08-18 17:24:00	2014-08-18T17:24:00	Sherlock	Partner	Transfer	Neutered Male	30.4515549397366	-97.474104510925	62.2464285714286
13	1 year	A700408	Cat	Domestic Shorthair Mix	Brown Tabby/White	2014-04-13	2015-04-15 13:34:00	2015-04-15T13:34:00	Nyla		Return to Owner	Spayed Female	30.4101154527976	-97.562415670838	52.5093253968254
14	2 years	A742287	Dog	Boxer/Bullmastiff	Brown Brindle/White	2015-01-18	2017-02-11 12:30:00	2017-02-11T12:30:00	*Kawhi		Adoption	Neutered Male	30.4551148649096	-97.3087780473978	107.931547619048
16	5 years	A723742	Dog	Miniature Schnauzer Mix	Black/White	2011-04-05	2016-04-10 17:27:00	2016-04-10T17:27:00	Gretchen		Adoption	Spayed Female	30.4792884863566	-97.4088531587999	261.818154761905
15	3 years	A712638	Dog	Pit Bull Mix	Red/White	2012-09-26	2016-07-18 17:52:00	2016-07-18T17:52:00	Marcus	Partner	Transfer	Neutered Male	30.5798299207017	-97.5588487936533	198.820634920635

1 / 1000

Breed Count

	age_upon_outcome	animal_id	animal_type	breed	color	date_of_birth	datetime	monthyear	name	outcome_subtype	outcome_type	sex_upon_outcome	location_lat	location_long	age_upon_outcome_in_weeks
filt															
36	6 months	A706953	Dog	Labrador Retriever Mix	Yellow	2014-12-06	2015-07-06 11:33:00	2015-07-06T11:33:00		Medical	Euthanasia	Intact Female	30.5480802368633	-97.2969969058957	30.3544642857143
732	2 years	A749782	Dog	Labrador Retriever Mix	Tan/White	2015-05-19	2017-07-25 14:59:00	2017-07-25T14:59:00	*Catalina		Return to Owner	Intact Female	30.6138310636757	-97.5752164857665	114.089186507937
1121	1 year	A757158	Dog	Labrador Retriever Mix	White/Black	2016-08-30	2017-08-31 14:12:00	2017-08-31T14:12:00	Pirata		Return to Owner	Intact Female	30.5572161697962	-97.5363224263878	52.3702380952381
1628	9 months	A740471	Dog	Labrador Retriever Mix	Tan/White	2016-03-17	2016-12-23 17:13:00	2016-12-23T17:13:00	Marley		Adoption	Intact Female	30.7569243032341	-97.7392549176654	40.2453373015873
1757	7 months	A742767	Dog	Labrador Retriever Mix	Black	2016-06-27	2017-02-14 15:20:00	2017-02-14T15:20:00			Return to Owner	Intact Female	30.4869754937324	-97.4280017197358	32.234126984127
1988	1 year	A762781	Dog	Labrador Retriever Mix	Black/White	2016-11-27	2017-12-03 11:09:00	2017-12-03T11:09:00		Partner	Transfer	Intact Female	30.2840111162863	-97.4600542219677	53.0782738095238
2041	2 years	A702745	Dog	Labrador Retriever Mix	Black	2013-05-22	2015-05-22 11:45:00	2015-05-22T11:45:00	Abigail		Return to Owner	Intact Female	30.7157941956301	-97.4523664870572	104.355654761905
2225	2 years	A757341	Dog	Labrador Retriever Mix	Black/White	2015-09-01	2017-10-03 12:27:00	2017-10-03T12:27:00	19	Partner	Transfer	Intact Female	30.3814182796497	-97.7373217391863	109.074107142857
3319	9 months	A687748	Dog	Labrador Retriever Mix	Yellow	2013-12-09	2014-09-09 17:01:00	2014-09-09T17:01:00		Suffering	Euthanasia	Intact Female	30.729653440489	-97.3912941009824	39.2441468253968
4222	1 year	A735551	Dog	Labrador Retriever Mix	Black	2015-09-25	2016-09-27 14:10:00	2016-09-27T14:10:00	Daisy		Return to Owner	Intact Female	30.5150703656925	-97.6092589677489	52.655753968254

1 / 2

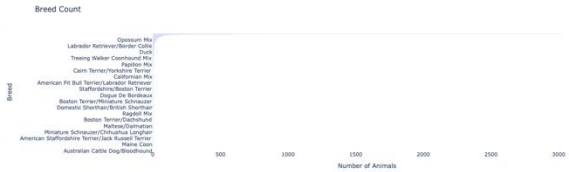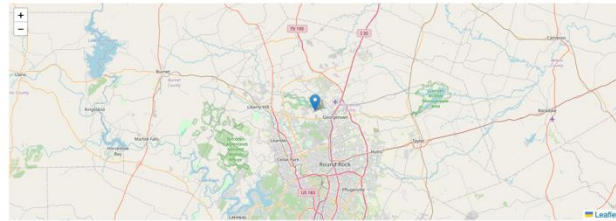Breed Count

Animal Search and Rescue Dashboard

- Water Rescue
- ⊙ Mountain Rescue
- Disaster Rescue
- Reset

	age_upon_outcome	animal_id	animal_type	breed	color	date_of_birth	datetime	monthyear	name	outcome_subtype	outcome_type	sex_upon_outcome	location_lat	location_long	age_upon_outcome_in_weeks
filter															
● 3130	2 years	A721834	Dog	Siberian Husky	Brown/White	2014-03-05	2016-03-23 16:23:00	2016-03-23T16:23:00		Suffering	Euthanasia	Intact Male	30.5680998448899	-97.320550480325	107.09751904127
● 5315	2 years	A708726	Dog	Alaskan Malamute	Sable/White	2013-07-30	2015-08-02 17:24:00	2015-08-02T17:24:00	Papa		Return to Owner	Intact Male	30.4309339291938	-97.480825836737	104.817857142857
● 6021	2 years	A728165	Dog	Rottweiler	Black	2015-05-31	2017-09-23 11:23:00	2017-09-23T11:23:00	Zeke		Return to Owner	Intact Male	30.466577208743	-97.5573520930426	120.924900793651
● 6191	2 years	A704101	Dog	Siberian Husky	Black/White	2013-06-01	2015-06-02 16:41:00	2015-06-02T16:41:00	Lobo		Return to Owner	Intact Male	30.4263764229275	-97.4309581796886	104.527876984127
● 6557	6 months	A765461	Dog	German Shepherd	Sable	2017-07-20	2018-01-22 11:54:00	2018-01-22T11:54:00	Sargent		Return to Owner	Intact Male	30.40668985085	-97.485680334266	26.6422619047619
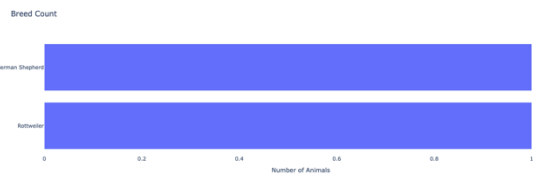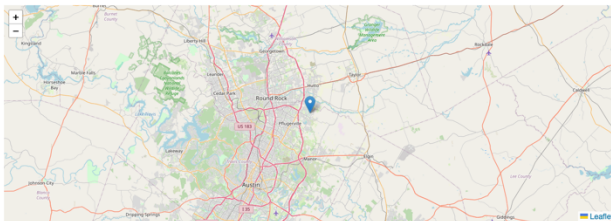
Breed Count

Andres Trujillo
Unique Id: 068017c6-8c82-4e36-9af9-bcc7cf94f9c9

Animal Search and Rescue Dashboard

Each one of these screenshots shows the capabilities of each animals mission capability with a map, and as well as the distribution of the number of animals found within each respective mission. This creates the ability to find the animal closest to you and allows you to choose from several animal types to best suit your liking or needs during a respective, water, mountain or disaster mission.