# CS 340 Project Two README

## About the Project/Project Title

*This project provides main functions to interact with a database. The user can utilize create, read, update, and delete (CRUD) functions to perform the appropriate task on the database. The client/server application provides an easy solution for the user to utilize information stored in the database. This application has a simple client-side interface that enables users to interact with the database which is located on the server.*

*To ensure that the Grazioso Salvare company can choose the right breed of dog for different rescue scenarios and conditions, the application’s interface provides simple radio items to filter the result based on the selected option. This interactive ability is an intuitive way of navigating and producing the right kind of results.*

## Motivation

*The user intends to insert animals’ information into a database as a central source of information and actively be able to search for animals and analyze information to determine suitable animals to train for the search and rescue mission. The user also seeks the ability to update animal information currently stored in the database with relevant data or delete animal information from the database that is no longer available to train or left the shelter. This project provides an optimal solution for different locations of the Grazioso Salvare company to actively monitor their database for all the available animals regardless of where the animals are located.*

*The process of finding the right kind of dog for the training program is not a simple task. To ensure that the dog is the right candidate for the training program, the selected dog must carry certain criteria.*

*Although a database is an excellent tool for saving data, the lack of ability to filter the available data in a database can easily overwhelm the user because they must search the high volume of data to find a match for their purpose. Simplifying the process of choosing the right kind of dog to train and prepare for the rescue mission is the key to the success of the project. That is the main deciding factor to implement interactive queries to filter the database based on the selected input and present the user with the appropriate result. To provide this ability for the user, radio items are implemented and attached to proper queries at the database level to achieve satisfying results.*

## Getting Started

*Follow these steps to properly set up the local copy of the application:*

1. *Database admin initially requires importing animals’ information from the file (aac\_shelter\_outcomes.csv) into MongoDB to have access to animals’ information currently available in the shelter.*
2. *To ensure that only authorized users would have access to the database, the database admin needs to add user information with the proper access level (role-based) into the database. The user then has a valid credential to log into the database and perform tasks based on the granted access level.*
3. *To optimally utilize the database and the program, it is highly recommended to create indexes on the common information needed for the shelter operations.*
4. *The program’s create, read, update, and delete functions provide create, read, update, and delete capabilities respectively for use with the database. The user only needs to provide a valid and acceptable form of input data for the application.*
5. *To insert animal information into the database simply provide the animal data in the form of key/value pairs which will be passed into the create function.*
6. *To query for an animal or list of animals, simply provide the animal data in the form of key/value pairs which will be passed into the read function.*
7. *To update existing animal data user requires to provide two sets of key/value pairs. The first key/value pair is for finding the animal inside the database and the second key/value pair is the new data that the user wants to update the old animal’s information with.*
8. *To delete an existing animal data user requires to provide the animal data in the form of key/value pairs which will be passed into the delete function.*
9. *To display the right kind of dog breed for the water, mountain, or disaster rescue training program, the user simply chooses the water, mountain, or disaster rescue radio items respectively.*
10. *To reset the result and display all the animals, the user simply chooses the reset radio item.*
11. *This is a very straightforward project and the user only requires following the steps to properly set up the local copy of the application.*

## Installation

*The decision to select the following tools and applications was made based on the simplicity, compatibility, performance, availability, and popularity of these applications. MongoDB is a powerful NoSQL database that can receive data as a document of key/value pairs. Python is a powerful programming language that has a similar data structure to MongoDB’s document called the dictionary. This fact makes these two tools very compatible with each other. In addition, the existence of the official MongoDB driver (PyMongo) for interacting and communicating with the Python programming language makes developers’ projects very simple and straightforward.*

*Dash framework simplifies the presentation of the data by providing tools to organize them in the table structure. Dash framework also has tools for the graphical presentation of data with charts and maps. Panda data frame processes the retrieved data from the database.*

1. *MongoDB for database access and operations.*
2. *PyMongo for connection between program and database.*
3. *Python for running the program developed with this programming language (files with .py extensions).*
4. *Jupyter notebook for running the program developed with this environment (files with .ipynb extensions).*
5. *Dash framework for the visual representation of data.*
6. *Panda data frame for processing retrieved data from MongoDB.*

## Usage

### Code Example

*This application consists of four main methods. Methods’ names clearly and concisely demonstrate the functionality of each method. The full code of the application follows right after these methods’ codes.*

* *Read method code example:*

*Graphical user interface, text

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* *MongoDB queries code example:*

*Text

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### Tests

*This program presents the results based on the selected radio item. Running the application results in displaying information of all animals stored in the database. The user then can choose radio items for the water, mountain, or disaster rescue to filter the results to display the dogs suitable for the water, mountain, or disaster rescue program training respectively. To reset the result and display all animals’ information again, the user simply needs to select the reset radio item.*

### Screenshots

* *Display all animals’ data available in the database:*

*A picture containing table

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* *Display dogs suitable for water rescue training:*

*A picture containing graphical user interface

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* *Display dogs suitable for mountain rescue training:*

*Chart

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* *Display dogs suitable for disaster rescue training:*

*A picture containing chart

Description automatically generated*

* *Reset the results and display all animals’ information:*

*A picture containing chart

Description automatically generated*

## Contact

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