# CS 340 Final Project README

## About the Project/Project Title

The purpose of this project is to create a functional CRUD (Create, Read, Update, and Delete) module in Python that connects to a database through MongoDB and displays the data in an interactive data table, geospatial map, and another graphical interface

## Motivation

This project will help me explore the basics of managing and developing databases.

## Getting Started

After installing MongoDB on your computer, run the command shell and access mongo without authentication first. Use the admin database and create for yourself an admin account with username and password, then do the same with the AAC database except with a read and write account. Then in Python, create a new class for AnimalShelter that initializes the usage of the database through Mongo with the read write user authentication. In the create function, include an argument for data and use the “insert\_one” method to add data to the document. In the read function, include an argument for key values and insert them in the “find” method. In the update function, include arguments for a query key value pair and an updated key value pair. To function properly, create a new variable that adds prefaces the updated key value pair with “ ‘$set’ : “ and insert the relevant data into the “update\_one” method. In the delete function, include an argument for key values and insert them in the “delete\_one” method. In all functions, check that the data is valid. Otherwise, throw an exception.

Then in the main .py file, import all relevant libraries documented below. Hard line in the program access into the Mongo Database with the created username and password. Then to build the dashboard with the HTML functionality imported through Dash, create an application be instantiating a Jupyter Dash class. Then fill the app class with the appropriate HTML lines for the desired output. Ensure that the data table has the required functionality to be interactive. Following the HTML code, define the callback methods to update the data table, geospatial map, and graph.

## Installation

The applications used in the development of this program were PyCharms and Jupyter Notebooks, both downloadable from the internet. The Python, Dash (specifically Dash, Dash Leaflet, Dash Core Components, Dash HTML Components, Dash Table, and Dash Dependencies), Numpy, Pandas, Plotly, Jupyter Plotly Dash, and MongoDB libraries will need to be downloaded as well, which can also be downloaded from the internet. Take note of the file path to access these libraries.

## Usage

### Code Example

Create(*self*, data) \*The data argument is of the dictionary data type in Python

-Inserts document with the specified key values, otherwise throws exception for invalid or no data.

Read(*self*, data) \*The data argument is of the dictionary data type in Python

-Searches database for all documents with the specified key value pair, otherwise returns no results.

Update(*self*, data, newData) \*The data and newData argument is of the dictionary data type in Python

-Searches database for a document with the specified “data” key value pair and updates the key value pairs from “newData”, otherwise returns no results.

Delete(*self*, data) \*The data argument is of the dictionary data type in Python

-Searches database for a document with the specified key value pair and deletes it, otherwise returns no results.

### Tests

The test code should create an object of the AnimalShelter class, initializing it with the user authentication previously made. A new document should then be made with all relevant key value pairs. Create a dictionary with test values that should update the values in the document just created. Then using the Create function, create a new document by inserting each key value pair into the document one by one. Then using the Read function, use a or multiple key value pairs to locate the document that was just created. Using the Update function, use a or multiple key value pairs to locate your document in the first positional argument, and in the second positional argument use the dictionary with the update values. Then using the Delete function, use a or multiple key value pairs to locate your document and delete it.

### ScreenshotsText Description automatically generatedText Description automatically generated

Graphical user interface, text, application

Description automatically generated

Text

Description automatically generated

## A picture containing text Description automatically generated

Text

Description automatically generated

## Table Description automatically generated

Table

Description automatically generated

Graphical user interface

Description automatically generated with medium confidence

## Table Description automatically generated with medium confidence

## Contact

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