Abdulrahman Al-Nachar

CS 340 / 4-1 Project One

**CS 340 Project One – CRUD Python Module**

**About the Project**

This project is for a MongoDB CRUD Python module I created for CS 340. The goal was to connect to a MongoDB database and build out all four of the CRUD operations—Create, Read, Update, and Delete. I worked with the AAC database, which has animal records from the Austin Animal Center. The collection used is called animals.

**Why I Built This**

I made this module to get hands-on practice with connecting Python to MongoDB. I had already done some Mongo stuff in the shell, but this project let me actually build something reusable in Python. The original goal was just to get Create and Read working, but I later added Update and Delete so the class could support a full set of operations for future integration into a user interface.

**Getting Started**

Before jumping into code, I had to set up the data and make sure authentication worked. Here’s a quick breakdown of what I did:

* Used the mongoimport tool to upload the aac\_shelter\_outcomes.csv file. It was located at /usr/local/datasets/ in Apporto.
* Created a user called aacuser with access to the AAC database.
* Verified everything worked by connecting through the mongo shell (mongosh), switching to the AAC database, and checking data with db.animals.findOne().

Once that was working, I started building the Python code.

**Tools and Installation**

* MongoDB (already installed in Apporto)
* PyMongo – This is the Python driver I used to connect to MongoDB. It’s the official one and works well with Python dictionaries.
* Python 3 – Already available in Apporto
* Jupyter Notebook – Used to test the module interactively

**Using the Module**

The module is a Python file where I wrote a class called AnimalShelter. Inside it are four methods that handle:

* Create: Inserts a document into the animals collection
* Read: Queries the database with a filter and returns results
* Update: Updates matching records with new data
* Delete: Deletes documents matching a given condition

All functions return confirmation data and have error handling so they don’t crash if something goes wrong.

**How It Works**

After writing the module, I tested it using a separate Jupyter Notebook. Here’s how the testing process went:

1. Imported the AnimalShelter class
2. Created an instance of the class
3. Added a test document with .create()
4. Pulled records using .read() with and without filters
5. Updated some data using .update()
6. Confirmed the update with another read
7. Deleted test data using .delete()
8. Checked again to make sure the records were gone

Everything worked as expected. The screenshots at the end of this document show each of these steps.

**Final Thoughts**

This project helped me understand how to write clean, reusable Python code that connects to MongoDB. I now have a working backend that could easily connect to a future frontend or dashboard interface.

**Contact**

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**Screenshots Included**

* MongoDB import command and result / (section 1)
* User authentication in the mongo shell (including aacuser) / (section 2)
* Jupyter Notebook tests for Create, Read, Update, Delete/ (section 3)

Section 1: MongoDB import command and result

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Section 2: User authentication

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Section 3: Jupyter Notebook tests for Create, Read, Update, Delete

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