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CS 340 Client/Server Development

The purpose of this project is to create a database in MongoDB that can interact with client-side code. The full-stack project is to help create software that includes a database and a client-facing web application dashboard that can work with existing data from animal shelters to identify and categorize available dogs.

1. To begin, I have imported a CSV file called aac_shelter_outcomes.csv into MongoDB

2. Created an administrator account and a user account via the mongo shell.

```
kennedy.uzoho_snhu@...

kennedy.uzoho_snhu@msnv-snhu3-l006: ~/Desktop

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db.auth("myUserAdmin", passwordPrompt())
Enter password:

1

>
>
>
>
>
>
```

Note: I later changed my Admin username from "myUserAdmin" to "kennedy" Created a new user account called "aacuser" for the database AAC via the mongo shell.

```
kennedy.uzoho_snhu@...

kennedy.uzoho_snhu@msnv-snhu3-l006: ~/Desktop

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use AAC
switched to db AAC

db.createUser(
...

user: "aacuser",
...

pwd: passwordPrompt(),
...

roles: [ { role: "readWrite", db: "AAC"}]
...
}
...

Enter password:

Successfully added user: {
    "user": "aacuser",
    "roles": [
    "role": "readWrite",
    "db": "AAC"
}

}

}

| Tole": "readWrite",
    "db": "AAC"
}

| Tole": "AAC"
```

Log in screenshots.

Admin, "kennedy"

```
↑ - □ X
                                       kennedv.uzoho snhu@msnv-snhu3-I001: ~/Desktop
File Edit View Search Terminal Help
(base) kennedy.uzoho_snhu@msnv-snhu3-l001:~/Desktop$ mongo -u kennedy -p
MongoDB shell version v4.2.6
Enter password:
connecting to: mongodb://127.0.0.1:54632/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("692a7648-3fae-4957-b707-a5f961346a33") }
MongoDB server version: 4.2.6
AAC
        0.003GB
admin 0.000GB
        0.010GB
city
config 0.000GB
enron
       0.007GB
        0.000GB
local
test
        0.000GB
```

A user account, "aacuser"

```
kennedy.uzoho_snhu@msnv-snhu3-l001: ~/Desktop

File Edit View Search Terminal Help

(base) kennedy.uzoho_snhu@msnv-snhu3-l001: ~/Desktop$ mongo -u aacuser -p --authenticationDatabase AAC aacuser

MongoDB shell version v4.2.6

Enter password:
connecting to: mongodb://127.0.0.1:54632/aacuser?authSource=AAC&compressors=disabled&gssapiServiceName=mongodb

Implicit session: session { "id" : UUID("7f48d9b3-a4df-4975-9460-df3f98e3b944") }

MongoDB server version: 4.2.6
> show dbs

AAC 0.003GB
> use AAC
switched to db AAC
> show collections
animals
>
```

3. Here is the PyMongo class that uses object-oriented programming methods to enable CRUD functionality in the database. This module supports code reusability, so other Python scripts can import this Python code as a module.

Animal shelter.py

```
from pymongo import MongoClient
    from bson.objectid import ObjectId
    class AnimalShelter(object):
    """ CRUD operations for Animal collection in MongoDB """
         def __init__(self, username, password):
    # Initializing the MongoClient. This helps to
    # access the MongoDB databases and collections.
              self.client = MongoClient(
    'mongodb://%s:%s@127.0.0.1:54632/AAC' % (username, password)
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              self.database = self.client["AAC"]
         # method to implement the C in CRUD
         def create(self, data):
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               # Checks to see if the data is None or empty and returns False in either case
               if data is not None:
                   if data:
                        self.database.animals.insert one(data)
              else:
                    return False
         # method to implement the R in CRUD
         def read(self, search):
              # Checks to see if the data is None or empty and returns an exception in either case
if search is not None:
                   if search:
                         search_result = self.database.animals.find(search)
                        return search_result
                   exception = "Nothing to search, because the search parameter is empty."
                    return exception
         def update(self, query, new_data):
               # Method to implement the U in CRUD
               if query is not None and new_data is not None:
                    if query and new_data:
self.database.animals.update_one(query, {"$set": new_data})
                         return True
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                    else:
                         return False
         def delete(self, query):
               # Method to implement the D in CRUD
              if query is not None:
                   if query:
    self.database.animals.delete_one(query)
                         return True
                   else:
                         return False
```

4. Created a Python test script that imports the above CRUD Python module (animal_shelter.py) to call and test all instances of CRUD functionality.

test script

```
# import AnimalShelter class from animal_shelter
     from animal_shelter import AnimalShelter
 4 # define data
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14
             "name": "Sara",
"outcome_subtype": "SCRP",
"outcome_type": "Transfer",
"sex_upon_outcome": "Female",
"location_lat": 30.6525984560228,
"location_long": -97.7419963476444,
15
16
17
              "age_upon_outcome_in_weeks": 52.9215277777778}
19
# define search criteria
search = {"animal_id": "A634647"}
23
24 # instantiate an object of AnimalShelter class
25 assignment = AnimalShelter('aacuser', 'password')
     # call the create method
28 success = assignment.create(data)
   print(success)
    # call the read method
    results = assignment.read(search)
     print(results)
    # call the update method
new_data = {"name": "Sari 2.0"}
update_success = assignment.update(search, new_data)
    print(update_success)
     # call the read method again to check the updates
41 updated_results = assignment.read(search)
     print(updated_results)
44
<pymongo.cursor.Cursor object at 0x7f89300a7da0>
<pymongo.cursor.Cursor object at 0x7f8934be7470>
```

```
In [10]:
                                         1 # call the read method
                                                   results = assignment.read(search)
                                            4 # convert the cursor to a list
                                            5 results_list = list(results)
                                                      # loop through the list to access individual documents
                                            8 for result in results list:
                                                                  print(result)
                                    {'_id': ObjectId('63d7f2f03a6c8ff6lee8fd64'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
9:00', 'monthyear': '2019-09-04T10:49:00', 'name': 'Sari 2.0', 'outcome_subtype': 'SCRP', 'outcome_type': 'Tra
nsfer', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'a
ge_upon_outcome_in_weeks': 52.9215277777778}
{'_id': ObjectId('63d7f2fb3a6c8ff61ee8fd66'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
9:00', 'monthyear': '2019-09-04T10:49:00', 'name': 'Sari', 'outcome_subtype': 'SCRP', 'outcome_type': 'Transfe
r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u
pon_outcome_in_weeks': 52.9215277777778}
{'_id': ObjectId('63df72160a2fbfb912085909'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pon_outcome_in_weeks': 52.9215277777778}
                                    On outcome in weeks: 32.92132//////8}
{'_id': ObjectId('63df72160a2fbfb912085099'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4 9:00', 'monthyear': '2019-09-04T10:49:00', 'name': 'Sari', 'outcome_subtype': 'SCRP', 'outcome_type': 'Transfe r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u pon_outcome in weeks': 52.9215277777778}
                                     1 delete_success = assignment.delete(search)
In [12]:
                                            2 print(delete_success)
                                     True
   In [13]: 1 # call the read method
                                                    results = assignment.read(search)
                                             4 # convert the cursor to a list
5 results_list = list(results)
                                                    # loop through the list to access individual documents
                                             8 for result in results_list:
                                                                       print(result)
                                    {'_id': ObjectId('63d7f2fb3a6c8ff6lee8fd66'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
9:00', 'monthyear': '2019-09-04Tl0:49:00', 'name': 'Sarī', 'outcome subtype': 'SCRP', 'outcome type': 'Transfe
r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u
pon_outcome in weeks': 52.9215277777778}
{' id': ObjectId('63df72160a2fbfb912085699'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
9:00', 'monthyear': '2019-09-04Tl0:49:00', 'name': 'Sarī', 'outcome_subtype': 'SCRP', 'outcome_type': 'Transfe
r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u
pon_outcome in weeks': 52.9215277777778}
{'_id': ObjectId('63df72310a2fbfb91208509b'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
9:00', 'monthyear': '2019-09-04Tl0:49:00', 'name': 'Sarī', 'outcome_subtype': 'SCRP', 'outcome_type': 'Transfe
r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u
pon_outcome in weeks': 52.9215277777778}
{'_id': ObjectId('63df7821002507777778}
{'_id': ObjectId('63df7821002505096'), 'age_upon_outcome': '2 year', 'animal_id': 'A634647', 'animal_ty
pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date_of_birth': '2019-09-04', 'datetime': '2019-09-04 10:4
                                       pe': 'Dog', 'breed': 'Pitbull', 'color': 'Black', 'date of birth': '2019-09-04', 'datetime': '2019-09-04' 10:4
9:00', 'monthyear': '2019-09-04T10:49:00', 'name': 'Sarī', "outcome_subtype': 'SCRP', 'outcome_type': 'Transfe
r', 'sex_upon_outcome': 'Female', 'location_lat': 30.6525984560228, 'location_long': -97.7419963476444, 'age_u
```