Cody Phelps

CS 499 Capstone

Enhancement 3 Databases

1. **Briefly describe the artifact. What is it? When was it created?**

    1. This artifact is an application created in IT 145. This is an application that is used as an animal rescue training service. This application allows you to enter a dog or a monkey into a system. It takes in their basic attributes and stores them. It then allows you to reserve an animal depending if it's training is done and they are in-service.

2. **Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

    1. The reason I selected this artifact for this enhancement was because it gave me a good chance to recreate this application using Blazor. This application orginally stored the animals in a list and this gave me a chance to add all this functionality into using a MongoDB database.

    2. This allows me to showcase my C# skills with .NET and Blazor. While this is my first application that I built using Blazor. Using a Blazor Hybrid application allows me to build an application that can be used on multiple platforms with the same code. This show cases my skills of incorporating a new MongoDB database to an application that previously did not use a database at all. This also allows me

to showcase using HTML and incorporating Bootstrap to help format the themes. It also showcases my ability to have a clean file layout.

3. This artifact was enhanced by adding a MongoDB database with a brand new GUI. This was done by using Blazor MAUI Hybrid. This gives me the ability to create this application on multiple platforms while using C# code. It stores all the needed information into the MongoDB and incorporates input validation to help secure the DB. There are only 2 forms where users can input any type of data and that is the Name forms when intaking an animal or if the animal is a dog then it’s breed. The rest of the forms are done using either number input, date picker, or select options. It features modals when adding or reserving the animals and it also features a table that can be filtered to show the data from the database.

3. Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

1. With this enhancement the conclusion of the course outcomes should be fully completed. The course outcomes I belive this demostrates is:

   1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science – completed by incorporating the new GUI so that users have a way of looking at the data in visual form without using a CLI.
   2. Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific

goals (software engineering/design/database) – completed by incorporating the new DB with a brand new GUI for users to be able to use.

3. Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources – completed by adding a Input Validation Class to check user inputs for NoSQL injections.

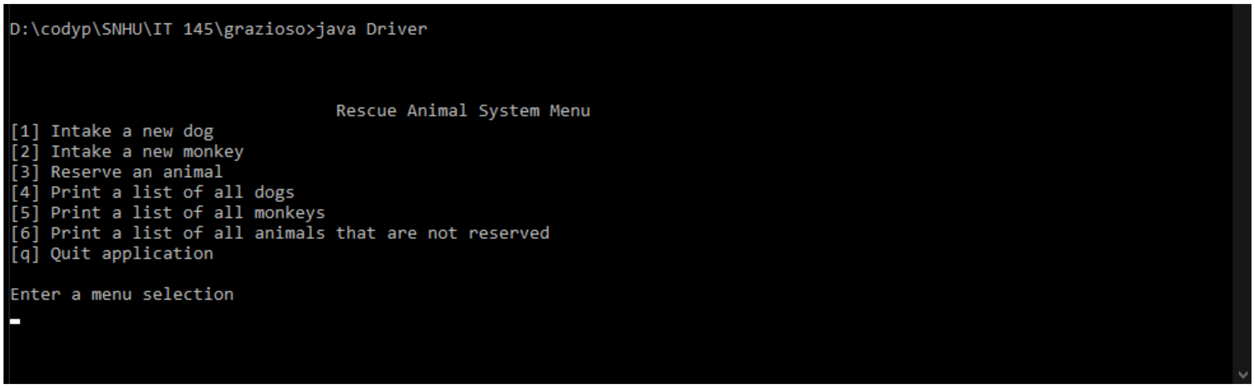
4. **Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

    1. While building this application I learned a lot about Blazor and the tools that I can use to build the components. The idea behind this application was that I wanted it to look a lot like a dashboard. Blazor is excellent for building web applications. Incorporating MongoDB witht his application had me thinking about security and if MongoDB could be attacked with injection. I learned that it is possible to attack a mongo database with injection but it looks way different from your normal SQL injection. This allowed me to build a filter for the users input to verify that no injection patterns could be used.

    2. The challenges I face with this application was doing the HTML and CSS. I am not strong at all in these areas but it helped me by drawing out what I wanted the

design to look like and then labeling what each area was with what the corosponding HTML tag would be. For example I wanted to have all the data displayed on a table so I labled the table headers as th and the table rows as tr and the data would be td.

Old CLI:

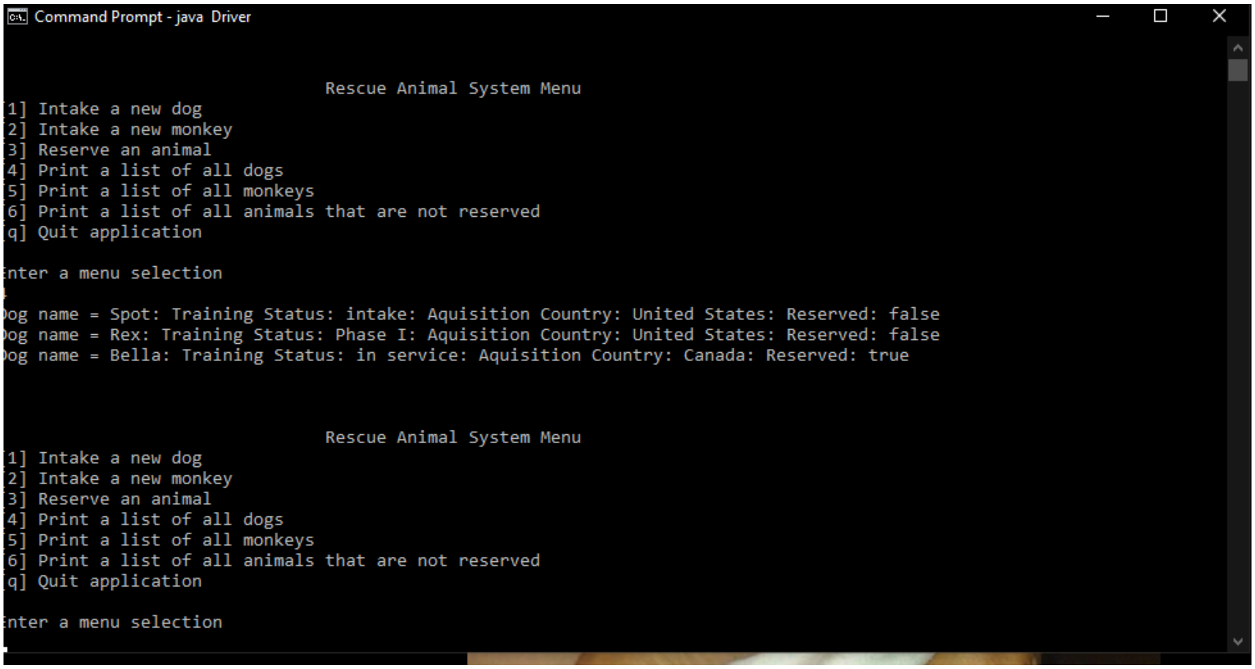


```
D:\codyp\SNHU\IT 145\grazioso>java Driver



                                Rescue Animal System Menu
[1] Intake a new dog
[2] Intake a new monkey
[3] Reserve an animal
[4] Print a list of all dogs
[5] Print a list of all monkeys
[6] Print a list of all animals that are not reserved
[q] Quit application

Enter a menu selection
```



```


                               Rescue Animal System Menu
1] Intake a new dog
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3] Reserve an animal
4] Print a list of all dogs
5] Print a list of all monkeys
6] Print a list of all animals that are not reserved
q] Quit application

nter a menu selection

og name = Spot: Training Status: intake: Aquisition Country: United States: Reserved: false
og name = Rex: Training Status: Phase I: Aquisition Country: United States: Reserved: false
og name = Bella: Training Status: in service: Aquisition Country: Canada: Reserved: true



                               Rescue Animal System Menu
1] Intake a new dog
2] Intake a new monkey
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4] Print a list of all dogs
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nter a menu selection
```
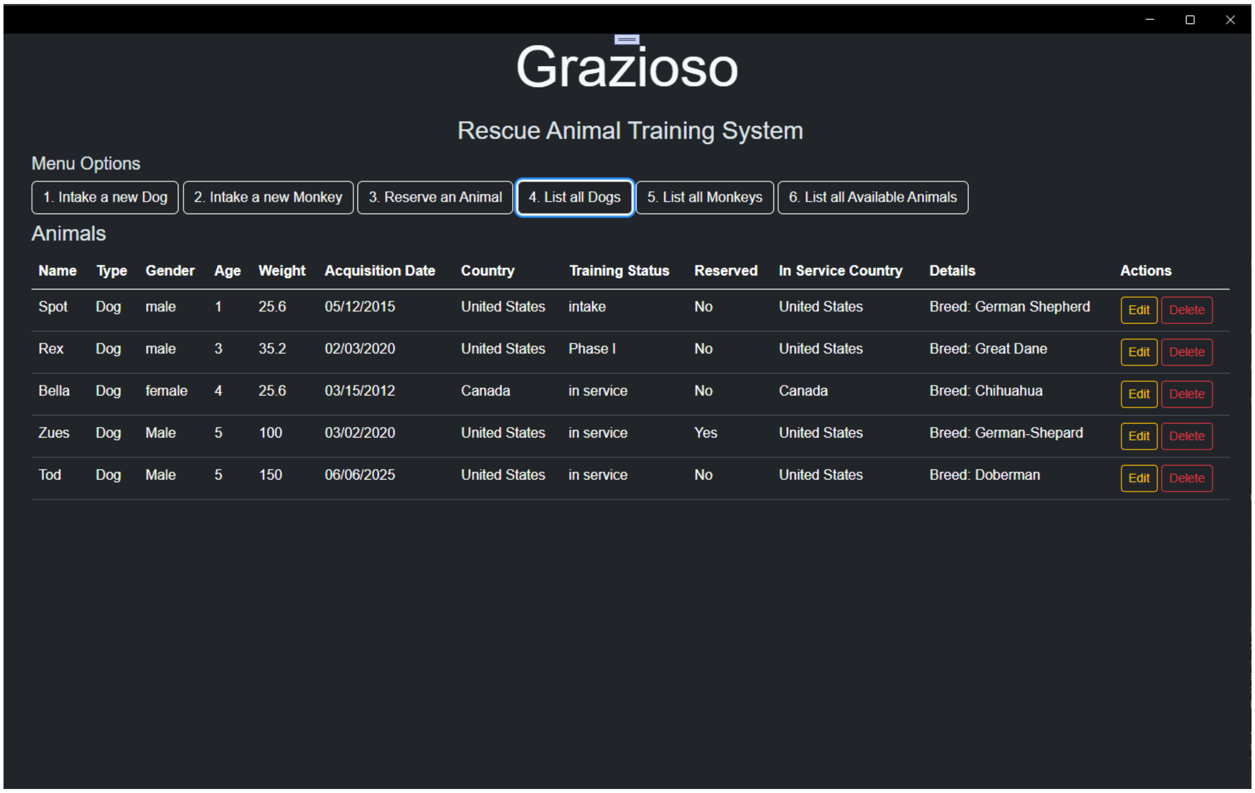
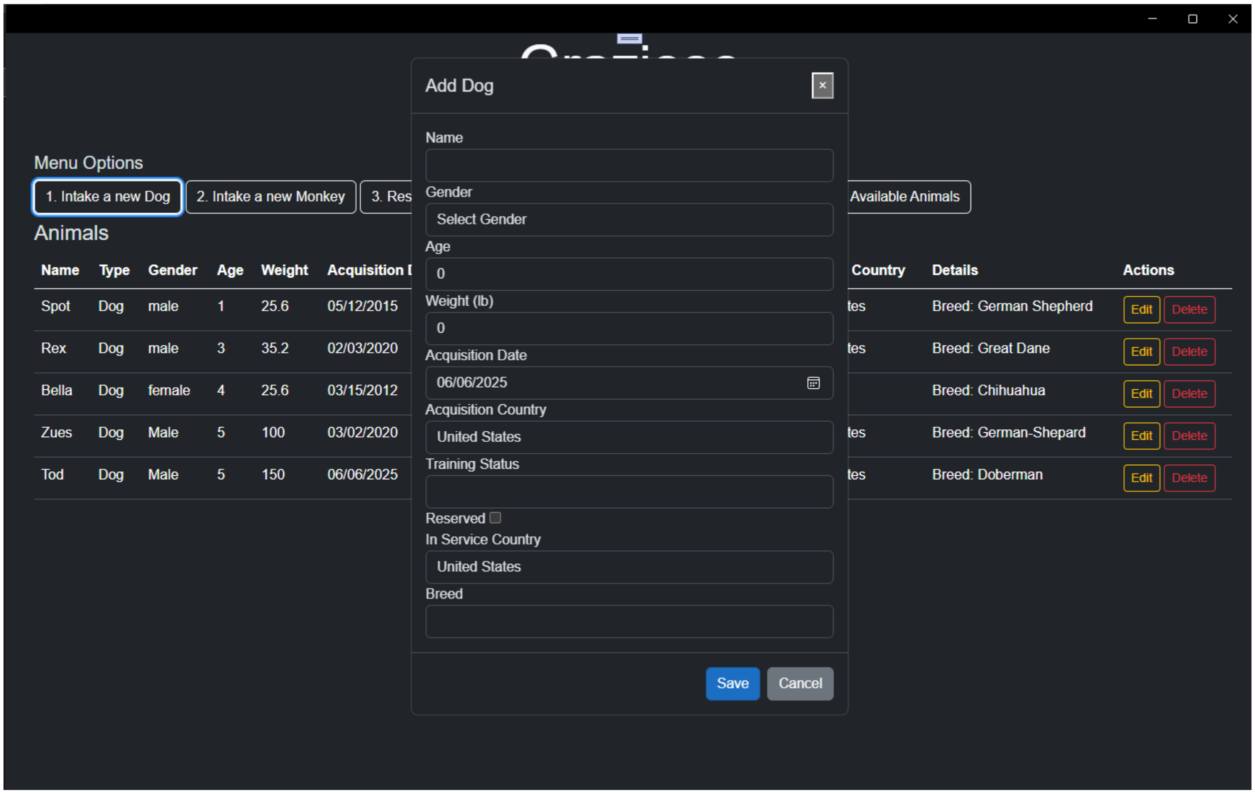

New Blazor MAUI Hybrid Application:



Animals

Name	Type	Gender	Age	Weight	Acquisition Date	Country	Training Status	Reserved	In Service Country	Details	Actions
Spot	Dog	male	1	25.6	05/12/2015	United States	intake	No	United States	Breed: German Shepherd	Edit Delete
Rex	Dog	male	3	35.2	02/03/2020	United States	Phase I	No	United States	Breed: Great Dane	Edit Delete
Bella	Dog	female	4	25.6	03/15/2012	Canada	in service	No	Canada	Breed: Chihuahua	Edit Delete
Zues	Dog	Male	5	100	03/02/2020	United States	in service	Yes	United States	Breed: German-Shepard	Edit Delete
Tod	Dog	Male	5	150	06/06/2025	United States	in service	No	United States	Breed: Doberman	Edit Delete



Animals

Name	Type	Gender	Age	Weight	Acquisition I	Country	Details	Actions
Spot	Dog	male	1	25.6	05/12/2015	tes	Breed: German Shepherd	Edit Delete
Rex	Dog	male	3	35.2	02/03/2020	tes	Breed: Great Dane	Edit Delete
Bella	Dog	female	4	25.6	03/15/2012		Breed: Chihuahua	Edit Delete
Zues	Dog	Male	5	100	03/02/2020	tes	Breed: German-Shepard	Edit Delete
Tod	Dog	Male	5	150	06/06/2025	tes	Breed: Doberman	Edit Delete

Add Dog

Name:

Gender: Select Gender

Age: 0

Weight (lb): 0

Acquisition Date: 06/06/2025

Acquisition Country: United States

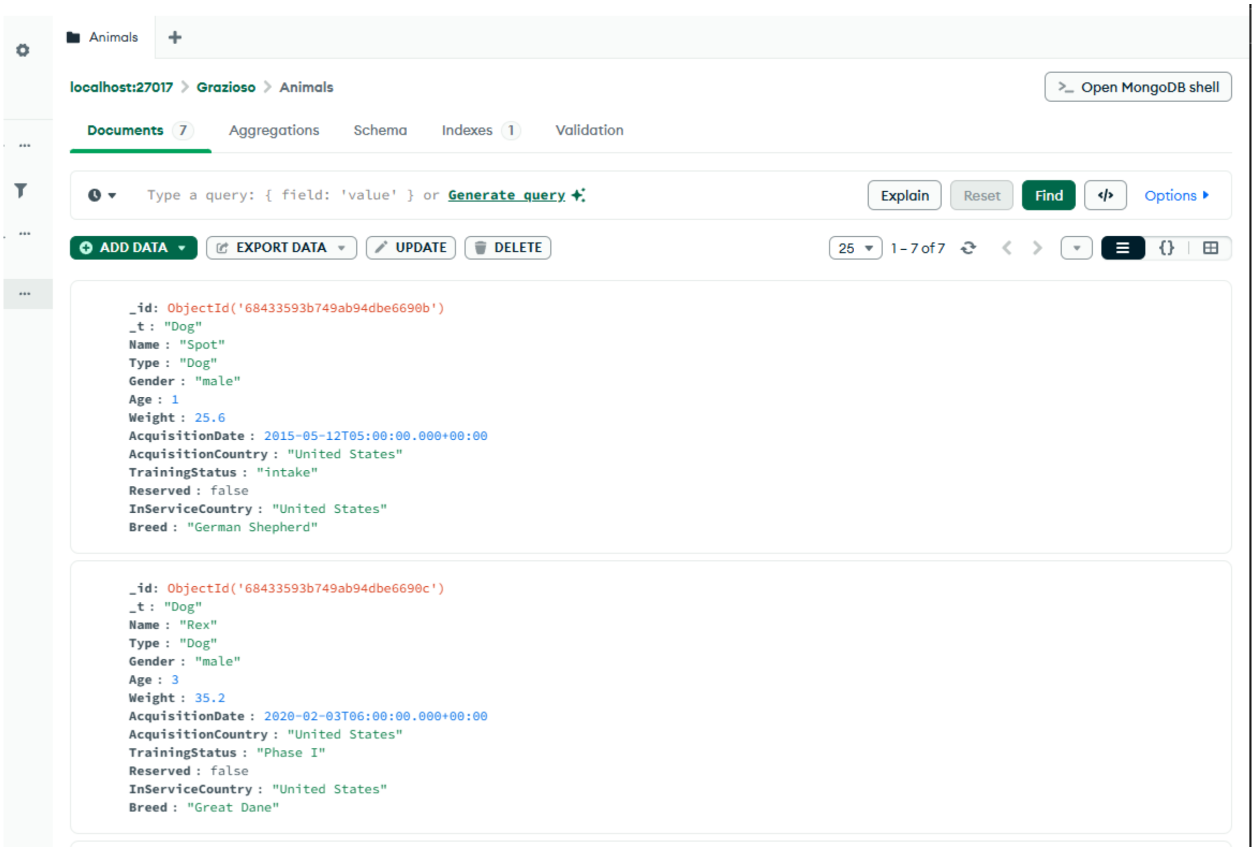
Training Status:

Reserved ☐

In Service Country: United States

Breed:

Pictures from MongoDB Compass showing DB with Animals:



```
_id: ObjectId('68433593b749ab94dbe6690b')
_t : "Dog"
Name : "Spot"
Type : "Dog"
Gender : "male"
Age : 1
Weight : 25.6
AcquisitionDate : 2015-05-12T05:00:00.000+00:00
AcquisitionCountry : "United States"
TrainingStatus : "intake"
Reserved : false
InServiceCountry : "United States"
Breed : "German Shepherd"
```

```
_id: ObjectId('68433593b749ab94dbe6690c')
_t : "Dog"
Name : "Rex"
Type : "Dog"
Gender : "male"
Age : 3
Weight : 35.2
AcquisitionDate : 2020-02-03T06:00:00.000+00:00
AcquisitionCountry : "United States"
TrainingStatus : "Phase I"
Reserved : false
InServiceCountry : "United States"
Breed : "Great Dane"
```