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CS340

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Professor Wilson

7-2 Project Two README

* Describe the required functionality of the project. Include the screenshots or screencast taken while testing and deploying your dashboard (Step 6) as proof that you have achieved the required functionality.

This project is a dashboard developed for Grazioso Salvare to provide an interactive interface for analyzing and visualizing animal rescue data. The dashboard does filter visualization, and geolocation of rescue animals using data from a MongoDB database. It is built using Python and uses the Dash framework for the web application structure.

A screenshot of a computer

Description automatically generated

A screenshot of a map

Description automatically generated

* Be sure to explain why MongoDB was used as the model component of the development, including what specific qualities or capabilities it provides for interfacing with Python.

MongoDB was used as the model component because it is flexible, and it can handle large volumes of unstructured data, such as animal records with varying attributes. MongoDB processes querying of the data which was a requirement for this assignment. MongoDB’s can store data in a format compatible with Python which was required for the application. Python’s pandas library is used to manipulate and prepare the data for display. Pandas works with Dash as well. Dash framework is built on top of Flask. It gives the application structure like the data table, graphs, and maps.

* Be sure to explain the Dash framework that provides the view and controller structure for the web application.

Dash framework provides both the view and controller parts of the application. Dash does the visualizations parts and UI parts by using Python. The Plotly library was used to create the plots, Dash did the map for displaying geo-location data of animals. The Pandas library handled the data, and MongoDB was used for database to store and retrieve shelter animal data.

* Be sure to include links to any resources or software applications that were accessed or used.

Dash documentation (https://dash.plotly.com/) helped with layouts and adding components. Plotly's documentation (https://plotly.com/python/) helped with charts. Dash Leaflet (https://dash-leaflet.herokuapp.com/) was for visualizations. The MongoDB documentation (https://www.mongodb.com/docs/) helped with how to use MongoDB databases using Python.

* Explain the steps that were taken to complete the project.

The steps taken to complete the project started with setting up the environment by installing the libraries and configuring the MongoDB. Next the layout for the dashboard was designed using Dash. The callbacks were made to filter the data based on user inputs. The project was tested with the dashboard. Any necessary adjustments were made to refine the user experience.

* Identify any challenges that were encountered and explain how those challenges were overcome.

Of course there were some challenges that were encountered. One example was when I was dealing with the dynamic filtering of data from MongoDB. The data table was not doing what I wanted when filters were applied. I tested the connection between Dash and the database. This was fixed by looking at the callbacks. Once the correct MongoDB queries were applied to filter the data it worked fine.