PDB Manager Final Summary

DSCI-532::Final Project 4

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7/25/2022

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Section 1

1. Link to webapp
    - https://margree-iu.shinyapps.io/PDB-Manager/
2. Link to github
    - https://github.com/greenmmq/well_manager
3. Link to video demo
    - https://iu.mediaspace.kaltura.com/media/t/1_1yezmiy4

Section 2

The PDB Manager application was built with R using the `RShiny` framework which provides tools for designing the front end `ui` and the backend `server` functionality. The database is a SQLite datbase accessed by R through the `RSQLite` and `DBI` packages.

App authentication is provided through the `shinyauthr` package. The Datatables are implementations of Java Data Tables through the `DT` library in R. Limited data transformation is handled in app through Tidyverse packages `tidyr` and `dplyr`.

The data was sourced from a groundwater monitoring program I work on, and is originally a running table that I have manually upkept for a couple years.

The app provides three main functionalities:

- ability to explore data
- ability to input new data

- ability to update existing data

Firstly, the app enables the user to dynamically explore PDB deployment and sampling information. There are many options available to the user to filter and sort exactly the necessary information.

Next the app enables the user to create new records by inputting new wells and recording PDB deployments to wells. Finally the app enables the user to update PDB records when they are sampled with the appropriate sampling information.

Section 3

Overall, the project went very well. I had initially tried a Python/MongoDB combination, but I lacked the coding experience necessary to build a functional app in a timely manner. `RShiny` was very easy to pickup and was a great way to interactively learn about web application principles.

SQLite was very useful as a database, and interesting how limited it is compared to large RDBMS platforms. For example, SQLite does not have 'date' or 'time' or 'datetime' data types. Instead these are stored as strings and interpretted through a `DATE()` function in SQLite.

The https://shinyapps.io/ platform was very easy to learn and navigate. It is point-and-click hosting so was very easy to setup. Although learning to navigate through the 'app.R' file was difficult at times. It was somewhat harder to debug at times than a typical R script, I think because of the bouncing back and forth to update multiple references.

I think there is still some functionality this app requires to be a useful app. For example, the data needs to be updated as there are many wells that say a PDB has been redeployed after the most recent event, but there is no record for a new PDB since that was not included in the original data. Additionally, the multiple functions for SQL querys building the reactive query table (with many conditional statements...) could be streamlined as it is not very efficient code.

Despite this, I think I did very well on the project, and it basically accomplishes everything I had set out to do. I would give it a 9/10.

Thanks for a great course!