DSCI-560 Assignment No. 5 - Part 2

Instructor: Young Cho, Ph.D.

Oil Wells Analysis and Visualization

This assignment is the second part of a 2-part assignment that focuses on providing you with PDF text extraction, web scraping, data preprocessing, and visualization. You will gain skills to collect and organize data from PDFs and create a web interface to visualize the collected information.

In this lab, you will work with your team on plotting the data we extracted in Part 1. We will create map layers to plot the position of the wells and represent the additional information we collected along with it.

1) Initial Setup

We will use web-related tools and platforms and MySQL database for this assignment.

Please use a Linux environment. (Make sure to document any setup steps/requirements for running your scripts in the document you submit)

Do not spend much time on the installation and setup; instead, invest your time in exploring the concepts and improvising your submission.

2) Webpage and Mapping

For this task, you will focus on creating map layers to plot the wells and represent the additional information we collected along with it.

Set up an Apache web server and create a webpage with a section for the map to be displayed.

Integrate maps for your data using libraries (You may use any map APIs and platforms available, including OpenLayers, as mentioned in the sample links below, or consider alternatives like Leaflet, etc.)

https://openlayers.org/en/latest/examples/overlay.html

Configure the map to display a base map and set the initial view. Then add push pins (markers) on the map to indicate the locations of the wells. Each push pin should correspond to a well location. This can be done differently, depending on the platform that you decide to use. Ensure that the coordinates (latitude and longitude) from your database are used to position the push pins accurately.

Implement a mechanism that displays a popup window with detailed information when a push pin is clicked.

https://openlayers.org/en/latest/examples/popup.html

The popup should display all the data related to the well, including well-specific information, well-specific simulation data, and any additional data collected from the website.

Thoroughly test your web page to ensure the map, push pins, and popups work correctly. Make sure that the data is presented neatly and easily read within the popups.

Document your code and provide instructions on how to use your web application.

3) Resources

Introduction to OpenLayers: https://www.youtube.com/watch?v=DqzJ6pwSwWk

Node.js for MySQL: https://www.w3schools.com/nodejs/nodejs_mysql.asp

4) Team Discussions

Your team is expected to meet in-person/virtually each day of the week and discuss the assignment progress and the next steps. Document and compile minutes of all meetings in a separate file called 'meeting_notes_A5_P2_<team_name>.pdf'

5) Submission

Make one submission per team. Each team must submit all the code files for the working solution, a readme document containing information for running the code in pdf format and a document that outlines the minutes of all team meetings in pdf format. Unlike before, please submit this document along with the video on the same date.

Provide a video per team which demonstrates the entire working solution and explains how the data tables were loaded and data was visualized. Please include the team name and the name of all three team members in the video.

There will be a 50% penalty for all late submissions.