**Embedding an interactive map in webpage**

Leaflet: a javascript map plugin ()

<https://leafletjs.com>

**Getting boundary of Canada postal codes as JSON, and put them on map**

According to my plan the map will be divided into several subsections to reflect different risk levels for bike owners in different parts of the town. I have no idea how to implement this before.

**Solutions:**

The Idea of GeoJSON: defining sections by a series of coordinate data that forms a polygon

Tutorials on Leaflet on how to use GeoJSON file to create data map with Leaflet

<https://leafletjs.com/examples/geojson/>

Postal Code: using postal code boundary to define subsections appears to be a good idea where 1. It matches the current database of 529 garage where they are already tracking location of reports with postal code and 2. Postal code boundary is already defined, so no need to reinvent the wheel.

Case study: displaying postal code areas of Montreal on the map using GeoJSON

<https://www.linkedin.com/pulse/mapping-geojson-polygons-montr%C3%A9al-postal-codes-js-alexandre-sabatier/>

The case study is based on an api that provides the base code to grab GeoJSON data for postal code boundaries from a database (with limited access for non-members) (I use the JQuery version under Javascript)

<https://rapidapi.com/VanitySoft/api/ca-boundaries-io>

from

<https://rapidapi.com/hub>

This API let me pull postal code boundary information in JSON, but it only provides me a base to work on. In order to pull postal code data in great quantity I have to copy the code, write a for loop myself and run it on XAMPP, a local web hosting platform. Funny thing is, it took me a while to figure out that I need to copy the code somewhere else to edit it, as I never worked with such a thing before.

After successfully figuring out how it works, I need to

**Result:**

Printed the result to a webpage with JQuery, copy the result, store in a json file locally, turn into a json array by adding an additional [ ] bracket around the result for future use.

**Ways to handle JSON in MySQL relational database**

After pulling those boundary information files in JSON format, I need to figure out a way to store it in database. I cannot just use the API tool to retrieve data because I am only allowed for 50 pull per day as a free user. IAT352 taught me about database design and generating database with MySQL, but it doesn’t cover how to deal with JSON object in database.

**Solution:**

store JSON file to mariaDB database with mysql, as well as how to retrieve them

<https://dzone.com/articles/using-json-in-mariadb>

Other Sources that I looked for, but didn’t use at end:

MariaDB (the database that i am using) Documentation on GeoJSON

https://mariadb.com/kb/en/geojson/

https://mariadb.com/kb/en/geojson-st\_asgeojson/

<https://mariadb.com/kb/en/st_geomfromgeojson/>

https://techcommunity.microsoft.com/t5/sql-server-blog/loading-geojson-data-into-sql-server/ba-p/384601?advanced=false&collapse\_discussion=true&search\_type=thread

https://learn.microsoft.com/en-us/sql/relational-databases/json/store-json-documents-in-sql-tables?view=sql-server-ver16

<https://stackoverflow.com/questions/52930395/correct-structure-for-a-json-object-with-multiple-values>

**Inserting a large JSON array into database: Auto-generating SQL insert commands with Python**

Since there is a lot of postal codes that need to be processed, it would be foolish to write SQL insert command for all those JSON objects one by one. To tackle the issue, I decided to figure out a way to auto-generate insert command with python.

Idea: pull the desired part from JSON, format a SQL insert command, store to an empty file, copy to sql folder and run

Tutorial on reading JSON file, pulling a specific element from a JSON object, with python

<https://yourblogcoach.com/how-to-extract-data-from-json-file-in-python/>

JSON formatter by the same author (not used for this project by far but might be useful)

<https://yourblogcoach.com/tools/json-formatter/>

write into file with python

<https://www.w3schools.com/python/python_file_write.asp>

**Pull multiple columns from server, send with PHP, and receive with JQuery**

Stored number of bicycle stolen reports as a separate column in database. The database now looks like this: table(id, GeoJSON, num\_of\_cases)

According to my plan the colour of each postal code section should change based on number of cases. In this case I need to pull both GeoJSON and num\_of\_cases from the database and send to frontend

I only know how to send once piece of data with php using echo.

Solution: prepare information pulled from database in an array, echo the array with php and deconstruct the array in JQuery

<https://stackoverflow.com/questions/6395720/get-data-from-php-array-via-ajax-and-jquery>