**Setup**

* **Download mamp 6.3 to set up the server (https://www.mamp.info/en/downloads/)**

In order to set up an Apache local server on which I was able to host the webapp, downloaded and installed Mamp and changed the root folder to the folder containing “index.php”. The php version used was 7.4.12.

The Port settings should be the following:

A screenshot of a computer

Description automatically generated with low confidence

* **Set up SSL in order to use local files**

In order to be able to use downloaded geojson files without CORS (Cross-Origin Resource Sharing) error, I set up SSL on the Apache server by following below steps:

(source: <https://www.linkedin.com/pulse/add-ssl-localhost-mamp-karan-mehta/?articleId=6700758225219846144>)

1. Generate a RSA-2048 key and save it to a file rootCA.key (note the pass phrase which you set on prompt)

openssl genrsa -des3 -out rootCA.key 2048

2. Now use the above key to generate the root SSL certificate. (In snippet below, certificate will expire after 100 days. You can change it as per requirement.)

openssl req -x509 -new -nodes -key rootCA.key -sha256 -days 100 -out rootCA.pem

3. Open Keychain Access. Click on System => Certificates, now click "Shift + Cmd + I" and import the rootCA.pem (which we created in above step). After that double click on imported certificate and expand the Trust section, and then set "When using this certificate" to "Always Trust". Refer screenshot below

Graphical user interface, table

Description automatically generated

4. Create a certificate key (server.key)

openssl req -new -sha256 -nodes -out server.csr -newkey rsa:2048 -keyout server.key

And enter all the data as prompted. For example:

Generating a 2048 bit RSA private key

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writing new private key to 'server.key'

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You are about to be asked to enter information that will be incorporated

into your certificate request.

What you are about to enter is what is called a Distinguished Name or a DN.

There are quite a few fields but you can leave some blank

For some fields there will be a default value,

If you enter '.', the field will be left blank.

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Country Name (2 letter code) []:US

State or Province Name (full name) []:CA

Locality Name (eg, city) []:Los Angeles

Organization Name (eg, company) []:USC

Organizational Unit Name (eg, section) []:Viterbi

Common Name (eg, fully qualified host name) []:localhost

Email Address []: abgarian@usc.com

5. Create a certificate file (server.crt)

openssl x509 -req -in server.csr -CA rootCA.pem -CAkey rootCA.key -CAcreateserial -out server.crt -days 500 -sha256

Output would be,

Signature ok

subject=/C=IN/ST=MH/L=Localhost Mac World/O=Local Mac/OU=Web Department/CN=localhost/emailAddress=example@example.com

Getting CA Private Key

Enter pass phrase for rootCA.key:

6. Search for httpd.conf file from Mamp folder and add following code at the end of file. (Configure the correct paths for DocumentRoot, SSLCertificateFile and SSLCertificateKeyFile)

# Custom code for SSL

Listen 443

<VirtualHost \*:443>

DocumentRoot "/Applications/MAMP/htdocs"

ServerName localhost

SSLEngine on

SSLCertificateFile "/Applications/MAMP/htdocs/server.crt"

SSLCertificateKeyFile "/Applications/MAMP/htdocs/server.key"

</VirtualHost>

**Front page on** [**https://localhost**](https://localhost)**:**

**Graphical user interface, application

Description automatically generated**

**index.php:**

In the front page of the webapp, there are options to select Debris Factor (low, medium, high), Socioeconomic Factor (low, medium, high), and the Tree Foliage Factor (on/off). It is not required to change any of these inputs in order to generate a map, as these settings are valid options to choose. The values of the options range from 0-2 and each step is interpreted as either a “low”, “medium”, or “high” value. The Foliage factor value is either “on” or 0. These values are then sent to the next page via POST.

The video in the background is one publicly available from lacity.org and can be changed easily in the <video> tag of index.php. Additionally, the web page is made responsive for various screen sizes. This page should be accessed by typing <https://localhost> into the browser url box.

**resources/js/index.js:**

This javascript code makes sure that the webpage begins with Debris and Socioeconomic factors selected as “Low”, and all values initialized as 0. This can be changed by replacing the txt variable to “Medium” or “High” and the value to 1 or 2 accordingly.

UpdateTextInput function updates the labels of the abovementioned factors to display the value selected.

[**https://localhost/sweepingneed.php**](https://localhost/sweepingneed.php) **page:**

**Map

Description automatically generated**

**sweepingneed.php:**

This page retrieves the values that were sent through the form in the index.php page from the $\_POST variable. The same form is available on this page however, the retrieved variables become the new values adjusted on the form. The options can be adjusted and a new map can be generated.

updateTextInput function, as in index.php, updates the labels of the inputs. refreshInput function updates the values of the inputs after new input values are selected and sent to the same page to generate a new map layer via POST.

**resources/js/sweepingneed.js:**

A routes map is generated with key-value pair of options selected from the previous page and file names to be used as layers.

Then, Arcgis function is started where colors per segment are identified based on the value of the “route” field. The “route” field, as designed by the algorithm team, represents the highest-lowest need for sweeping. Therefore, about 25% of the lowest values (representing highest need for sweeping) are colored in red, followed by the next 25% (more than average need for sweeping) with color orange, followed by next 25% (less than average need for frequent sweeping) colored by light green, followed by the next 25% (least need for frequent sweeping) with the color dark green. This is shown in a legend on the bottom-left corner of the screen.

A search widget is similarly added to the upper right corner of the screen, for users to be able to go to a certain location and examine the areas nearby. A zoom in/out button is also added at the upper left corner of the screen.

Finally, a popup template is created every time a user selects a given segment. It displays the number which determines it’s standing for sweeping need out of all the rest of the streets that require sweeping.

Just as in the previous page (index.php), this page is made responsive as well for various screen sizes.