2022

CAB230 Assignment 1 Client Side

CAB230

Volcano API – Client Side Application

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Contents

This template is adapted from one created for a more elaborate application. The original author spends most of his professional life talking to clients and producing architecture and services reports. You may find this a bit more elaborate than you are used to, but it is there to help you get a better mark

This report should be around 10 pages or so including screenshots – there is no formal page limit, and the length will depend a lot on the number of screen shots, but you won't get any extra marks for a really long report.

Introduction

Purpose & description

VolcMapR is an application for browsing the volcano data provided

In a second (and maybe third) paragraph, go ahead and tell us what to look for in your app: ***What did you do that was different? Did you do something to provide the user with functionality beyond what was expected? Is there some special set of modules that you have used that make it look great? Is there some other module that you have used that makes it more efficient?*** At this point, this description is at a very high level still. You will list your modules below.

At this point you can show 1-2 basic screenshots of your application to illustrate the approach, but leave the more detailed screenshotting to the use cases below.

Completeness and Limitations

My project is complete to at least a grade of 6, potentially a 7. As per the first sentence of the standards for a 6, I have exceeded all requirements for a 5. I have controlled forms, a responsive grid with pagination for display of volcanos, a data page that features a working map, and should the user be logged in, a chart of population data. Navigation is handled through react router, and my website has clear navigation through the use of a header, with visual and text based prompts to guide the user through the experience. In terms of design, I have gone for a minimalist aesthetic with a very basic, uncluttered layout themed around lava and volcanic stone.

While the app has minor issues with CSS, I believe the robust functionality and quality of execution would support a push towards a grade of 7, if not a high 6. Of particular note is the dropdown for countries, which also works as a search bar that automatically culls down the list of countries to only those that match the search

Use of End Points

In this section we want you to show us the facilities that you have provided in the app. Here you should ***organize the discussion around the endpoints of the API, showing the screen corresponding to that endpoint and providing a brief discussion of what it doe***s. (A couple of sentences is fine here – the screen shot tells the story. Write more if there is something you want to tell us. But otherwise just keep it short.)

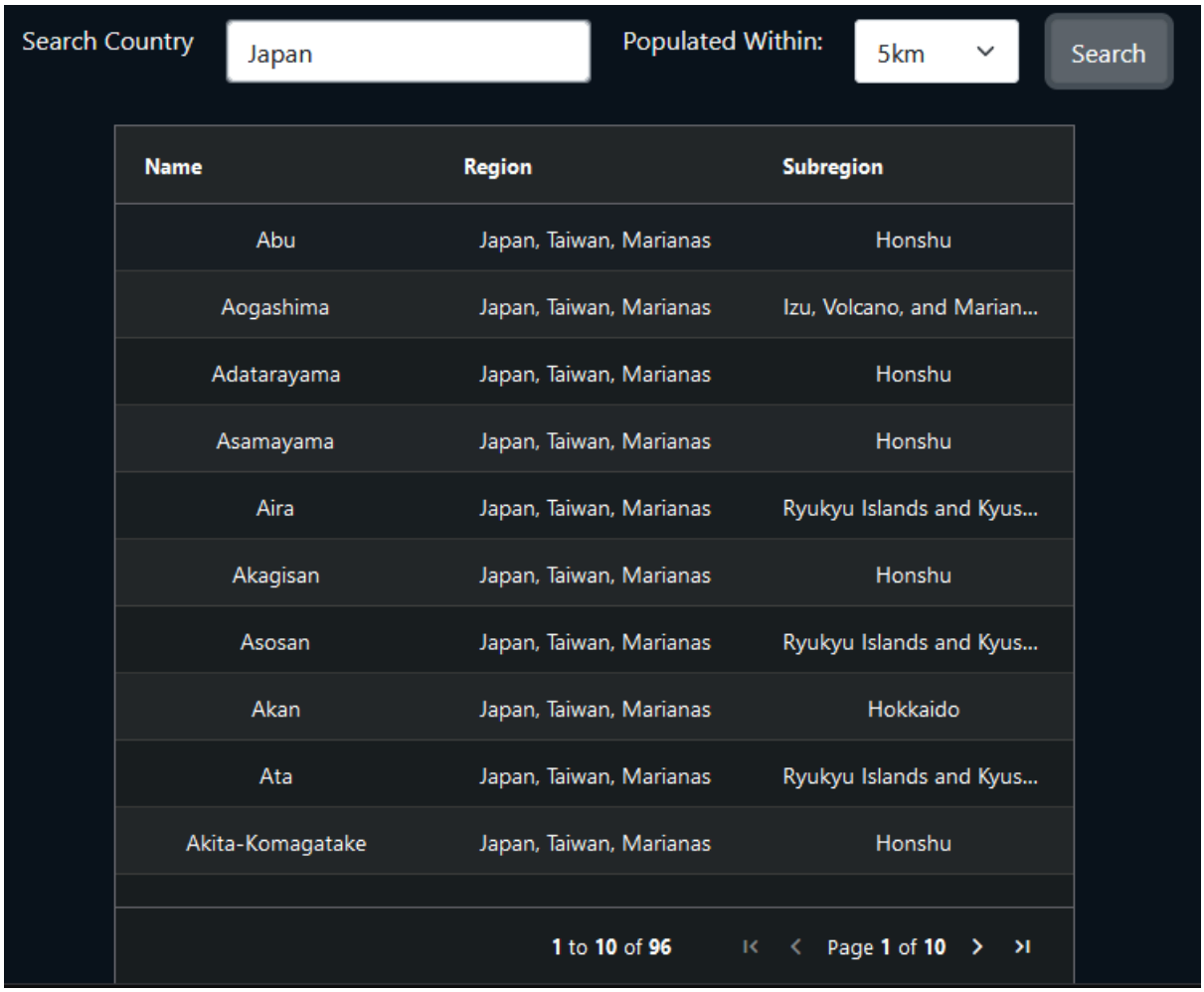
/countries

The countries endpoint was used by the component CountrySelector. On first render, it pulls a list of countries which are used to populate the search bar on the VolcList page. This is only called once. As

the user enters letters into the search, the dropdown list is culled client side.

/volcanoes

The volcanoes endpoint is consumed by the VolcGrid component. When the user clicks the search button above, VolcGrid is passed the selected country from CountrySelector and optionally, a populated within distance. This is used to populate and AG Grid like so:



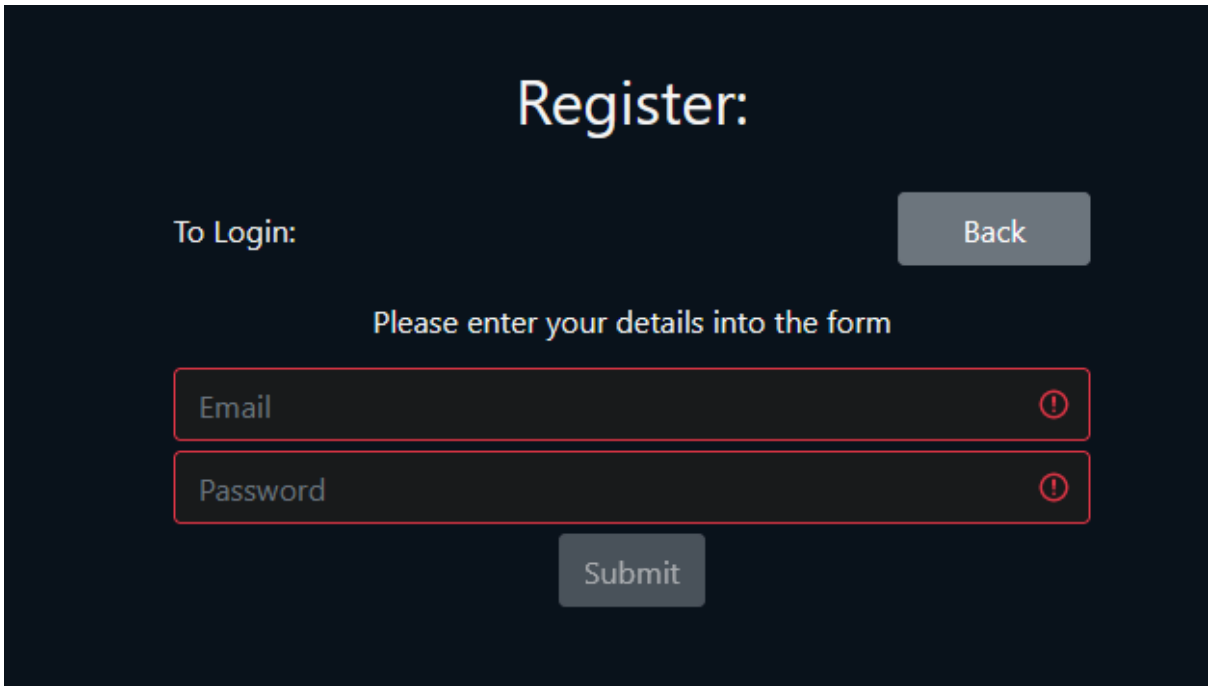
The component supports pagination, as well as filtering and sorting each column of the table.

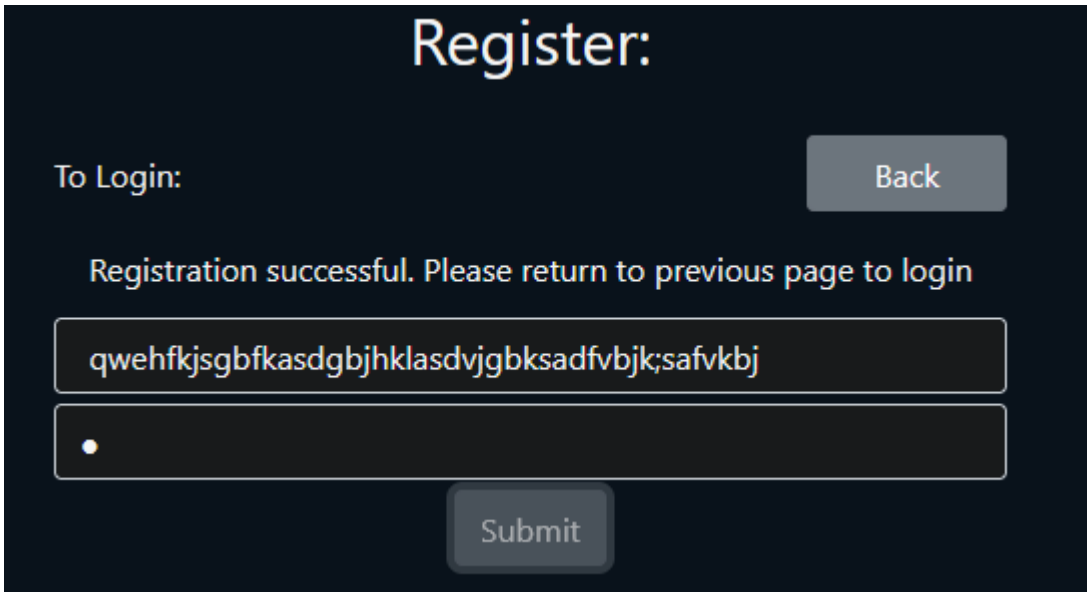
/volcano/{id}

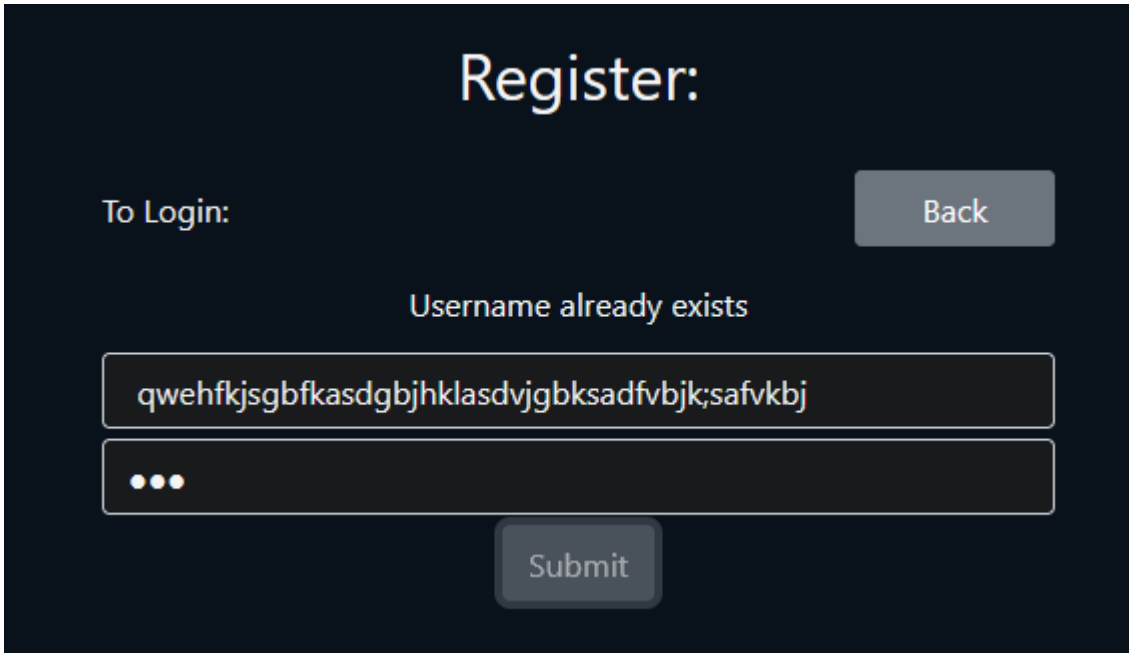
When a row is clicked on the above AG Grid table,

/user/register

The register page is a simple react strap form. Input verification was not required by the endpoint, and none has been used. The form can not be submitted with empty input fields, and the fields correspond to form parameters

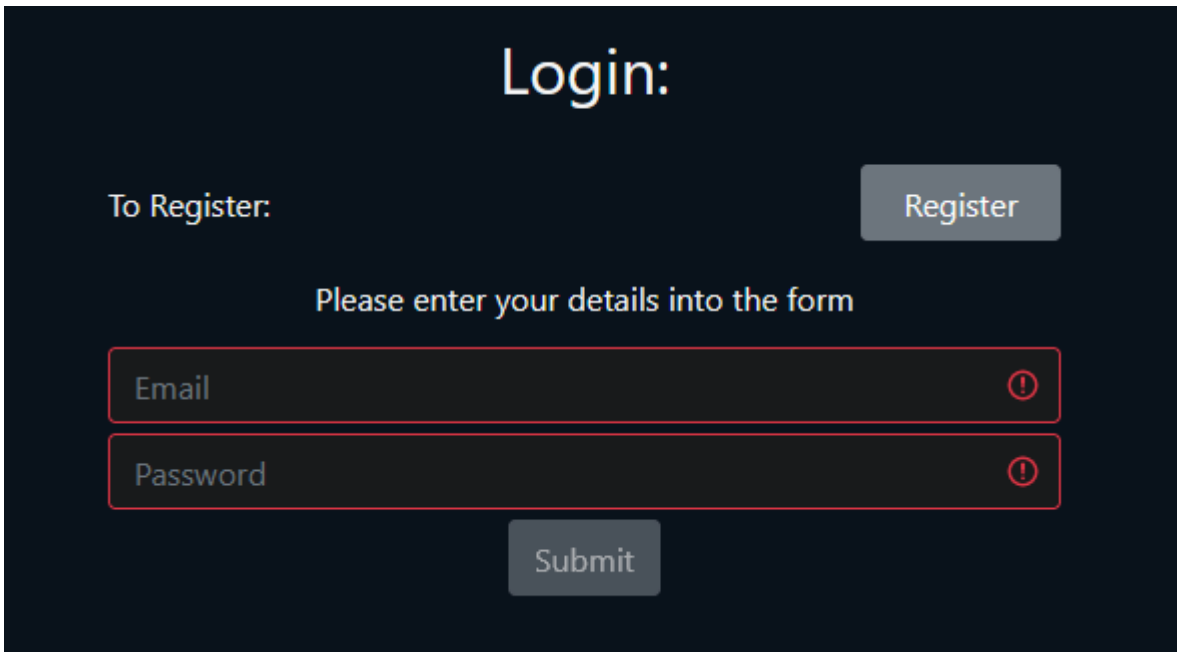


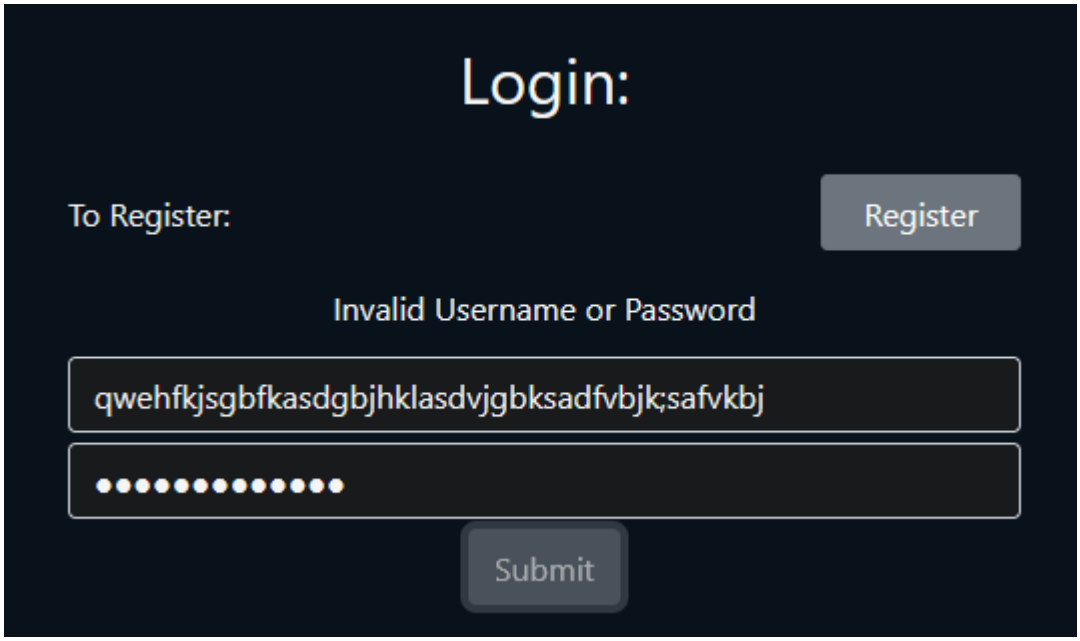


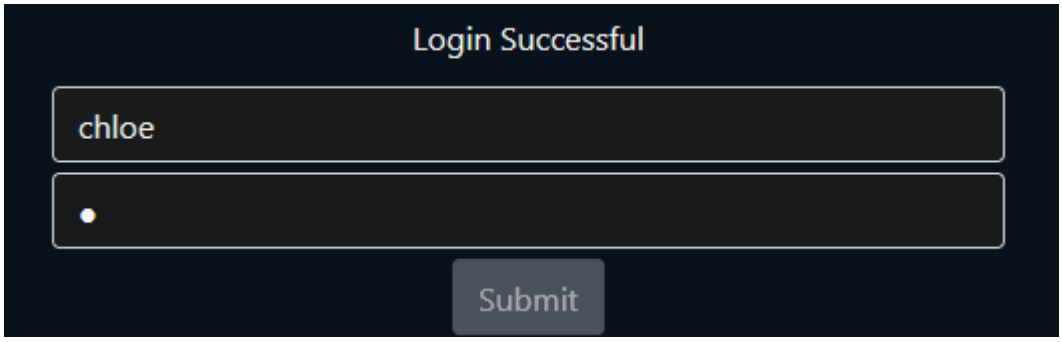


/user/login

The login form functions very similarly to the register form, as the base component is the same. It has slight modifications as needed







Modules Used

Ag-grid-react

Module to provide fully-featured table components, including sorting and filtering.

https://www.ag-grid.com/react-grid/

Ag-grid-community

Module with themes for AG grid

https://www.npmjs.com/package/ag-grid-community

Bootstrap

Front end JS toolkit with themes and prebuilt components

https://getbootstrap.com/

JWT-decode

Small library for decoding JWT clientside – useful for finding expiry dates of tokens

https://www.npmjs.com/package/jwt-decode

Pigeon-maps

Lightweight JS mapping library

https://pigeon-maps.js.org/

React-chartjs-2

React wrapper for chartjs-2.

https://react-chartjs-2.js.org/

Reactstrap

React wrapper for bootstrap

https://reactstrap.github.io/?path=/story/home-installation--page

Application Design

Navigation and Layout

When designing the site, I faced few challenges. I had the list of endpoints and the examples shown in the assignment brief. I knew that I wanted and SPA and I knew that I wanted 3 major pages: Home, Volcanoes, and Auth. The layout was easy, the site is straightforward featurewise. The most important data goes at the top, and the least at the bottom

I knew that I wanted the aesthetic of the site to be volcano themed from the start, with a default darkmode. The biggest change from concept to final product was that the hero banner was dropped from the homepage. Erupting volcanos make for highly contrasting images that are impossible to render readable text across.

The navbar at the top directs the user across the three main pages. On the login page, the user can swap between the login and register forms with a button on the form. The volcanoes page (/VolcList) is the only page with somewhat complex navigation, but this follows how a user would use the app. The user must first search for countries and submit a short search form to see a table of volcanoes for a given nation. Then the user must click a volcano to access its dedicated pseudo-page. If the user wishes to return to the table, they must click a button on the page, rather than use the browsers back button, and the only way to access the pseudo-page for a particular volcano is to find it in the table.

In hindsight it would have been better to allow the user to navigate to a dedicated page for displaying volcanoes if they already know the ID of the one they are looking for. It should have been its own full page in the app. This would have allowed users to enter the ID into the URL bar of their browser to access the page, as well as use the browsers built in back button.

Usability and Quality of Design

The app is very usable, and only has a few small faults, as discussed in paragraph 4 of the previous section. The app is well organized with a clean and minimalist layout that uses well matching yet on theme colours with mostly clear navigation. In a few places it may not be immediately clear to the user, however this was remedied with extremely brief textual prompts. All navigation and elements well labelled, with consistent sizing across the site. Text is organized and sized consistently across the site with bigger and smaller headings corresponding to importance of information conveyed. One text colour and font is used for all elements on the site bar the hero image on the home page. It contrasts without clashing with the background, which makes it easy to read

Where appropriate, elements are disabled or highlighted to clearly show the user something requires attention. This is most prominent on the register and login pages.

Inspiration was taken from other webapps, particularly for layout. Content is often kept more central on a page and info is typically placed in a clear vertical hierarchy, which I have used when appropriate.

Aesthetically the design is quite basic, which does not at all detract from usability, however with more experience and skill the site design could be revisited and made much more professional.

Accessibility

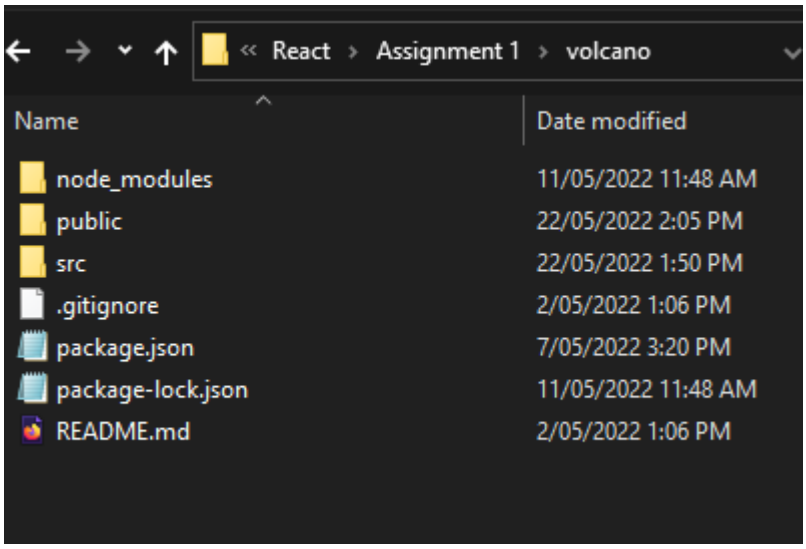
- Unfortunately, due to limitations with CSS technical skill, alt text and responsiveness is hampered. Similarly, class and id attribute are not always used fully correctly

- Every element has a text label, nothing is indicated purely by color or shape alone except for the AG Grid component, where standardized conventions are used for sorting and filtering. These are used with context
- Every document may still be read without the style sheets loading
- No screen flickering or flashing
- Headers on data are clearly labeled especially on tables
- Contrasting colours in both hue and brightness are used for all text and background colours
- Information is kept concise and precise

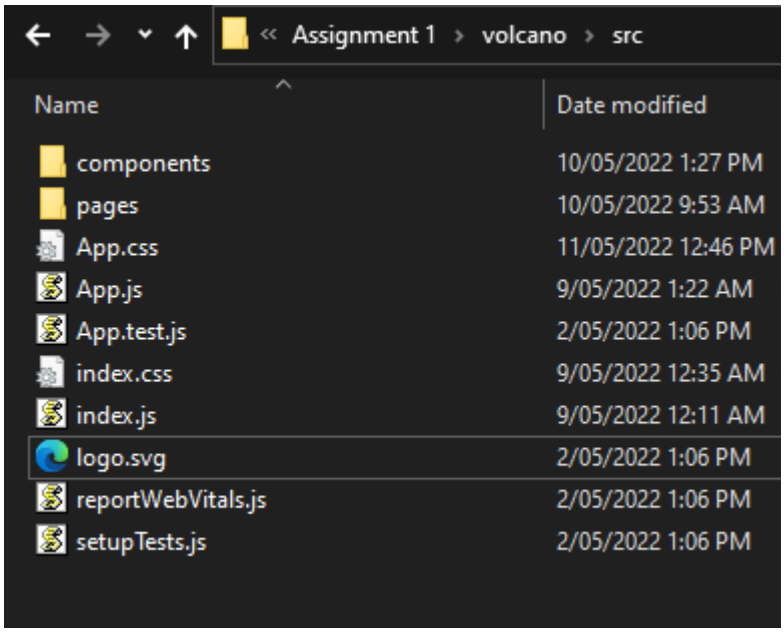
Technical Description

Architecture

The app uses Reacts standardized boilerplate structuring for ease of development:

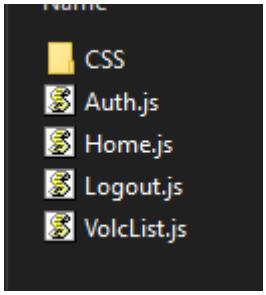


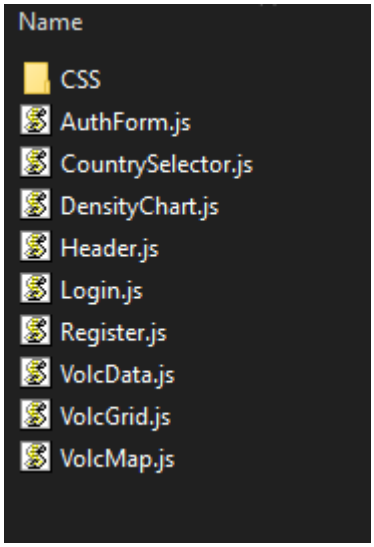
The source code is located within the src folder and again uses Reacts boilerplate for ease of development:



App.js is used as the launching point for the app, as is standard. From here two extra folders were used, pages and components. Logically this separates handling of pages from the components displayed within. Each page has its own URL.

Inside both folders there is another subfolder for CSS. Sitewide css is handled in the root src folder, but specifics for each page or component were handled in their own css file, as needed





Each individual component was split off into its own file. There are two main pages of the app that feature components, VolcList and Auth. Starting with Auth, because the data required for registering was no more than was needed for logging in, a single form (AuthForm) was used for both. This form is passed the query that it needs to use for its relevant use case (register, login). These queries passed either a confirmation or error message back to the form to display as needed.

VolcList used a large number of components, and logically, each ‘section’ was split off into its own component. The first is CountrySelector, which does what it says on the tin, and is the form seen above the table. This executes the volcano query when submitted, and passes the data to VolcGrid, which displays the data underneath CountrySelector. When a row is clicked, the page renders the VolcData component, which in hindsight, should have been its own page. This renders the data from the volcano, but also calls VolcMap and DensityChart. Ideally VolcData would just render the volcano data and not perform double duty of being a page. VolcMap and DensityChart are for the map and chart respectively.

The header is the same and displayed on all pages, and as such, has its own component.

Test plan

Task	Expected Outcome	Result	Appendix A Item
Load Home Page	The home page is shown		1
Use navbar, nav to volcano explorer	Volcano explorer shown		
Select a country	A country can be selected and entered		2
Population data can be used as a paramter	Results are culled by population		3
search bar for countries offers autocomplete	List of valid countries offered		4
Autocomplete based off of user input	List of countries culled using query		5
"wrong"country handled smoothly	Table renders no rows		6
Click table colum header to sort	Table data is sorted relative to its datatype		7
Click table colum header to filter	Table data is flitered relative to its datatype		8
Click row to see individual volcano page	Takes user to volcano info page		
Volcano page displays info and map	Displays a map and relevant data		9
Clicking return on volcano page goes back	Returns to the table of all volcanoes		
Map can be panned and zoomed	Works like google maps		10
Navigate to login	Goes to login page		11
Navigate to register	Goes to register page		12
Return to login	Goes to login page		
Empty form	Form cant be submitted		11,12
Enter in correct name and password to login	User logs in and gets confirmation		13
Log out on expired token	Displays an error and logs user out		14
Gibberish username entered and handled	Displays an error		15
User can register	Displays confirmation of registration		16
Entering existing username	Displays relevent error		17
User can log out	Confirms user log out.		18
When logged in, chart of pop data is displayed	Chart displayed on individual volcano page		19

Difficulties / Exclusions / unresolved & persistent errors /

By far the most difficult part of the project was learning to use CSS. It is the weakest part of the project, and when using the site, there are several slight inconsistences. None of the CSS issues take away from the core functionality of the project, but they do hamper the professionalism. There is one larger error, where the chart on the volcano page does not sit well within the layout. Several components will not scale well with size because magic numbers were used. These were issues that I am confident I could fix, but due to health reasons, I ran out of time.

Extensions (Optional)

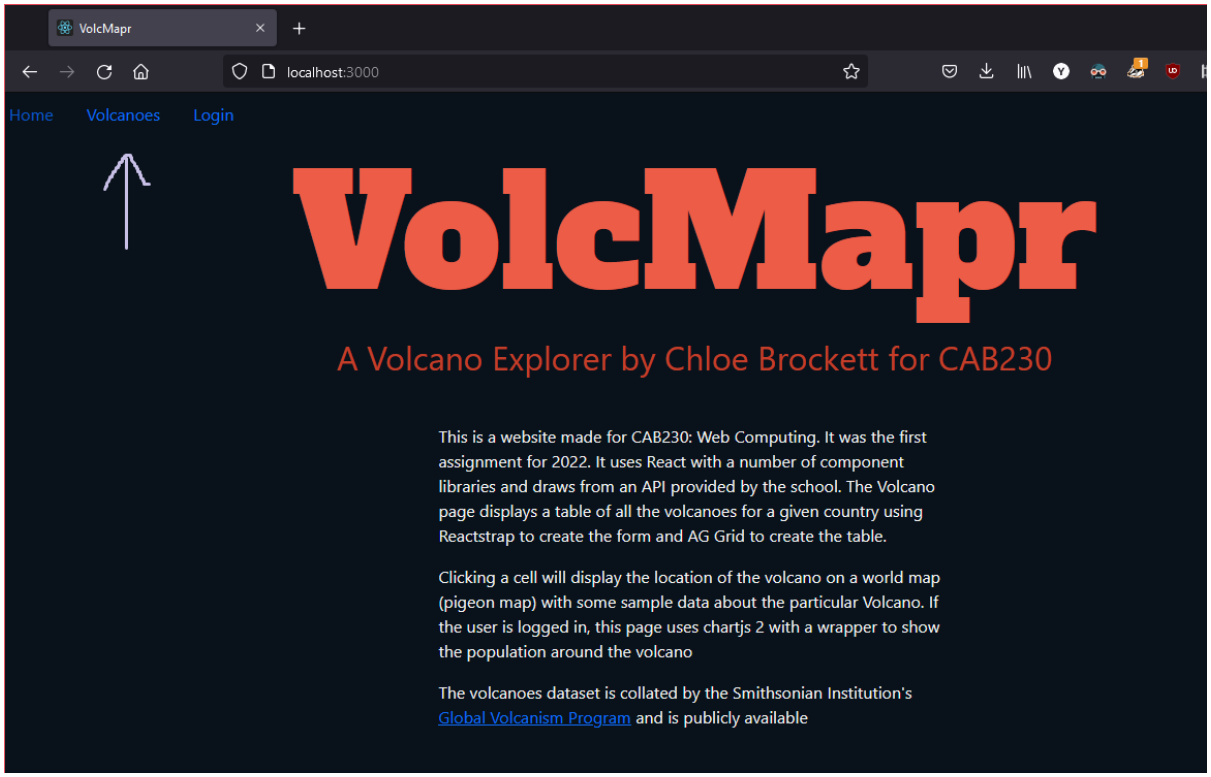
The most obvious extension is on the chart showing population inside a certain radius from the volcano. This could be easily extended to optionally show population density without requiring any more calls to the API. As we already know the radius from the volcano, area can be calculated as pi*r^2. Dividing the population given by the api by the calculated area would give people per square kilometer, a standard figure for population density

Another extension would be to add input validation to the auth form using regex, or perhaps an external module if one exists. The user logs in with their email and password, which are common, so libraries for validifying field requirements should be available.

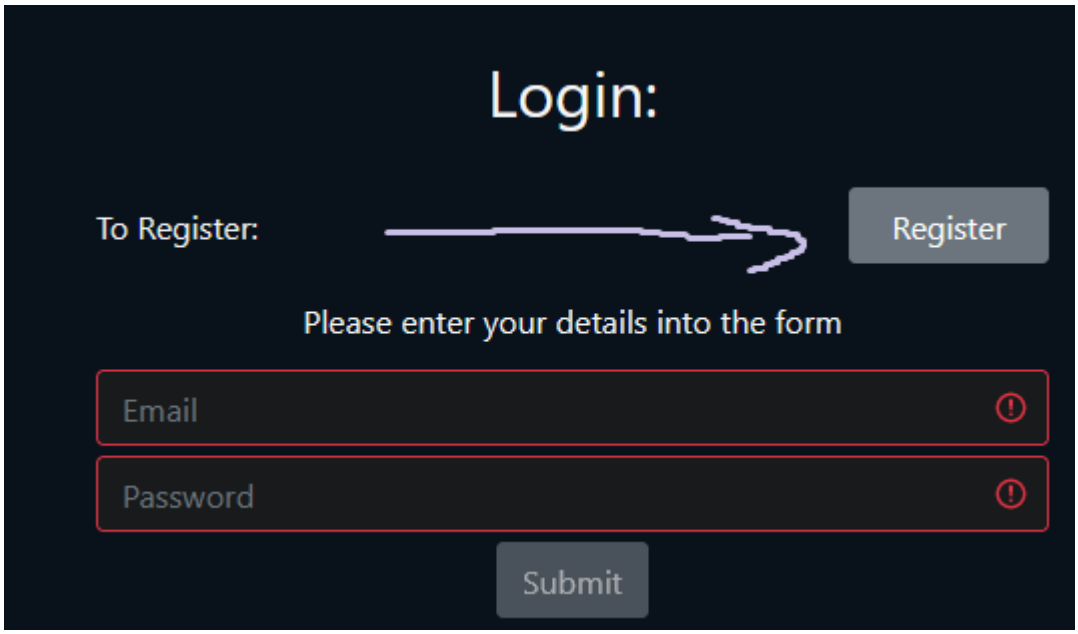
A third extension would be to show the population density discussed in the first paragraph on the map. Circles could be drawn to show distance as an overlay with some sort of indicator for density. This could be a repeating pattern, or shifting colours such as is shown on infrared cameras or rainfall maps.

User guide

Upon loading the app the user will be greeted with the homescreenm and can navigate using the navbar as shown

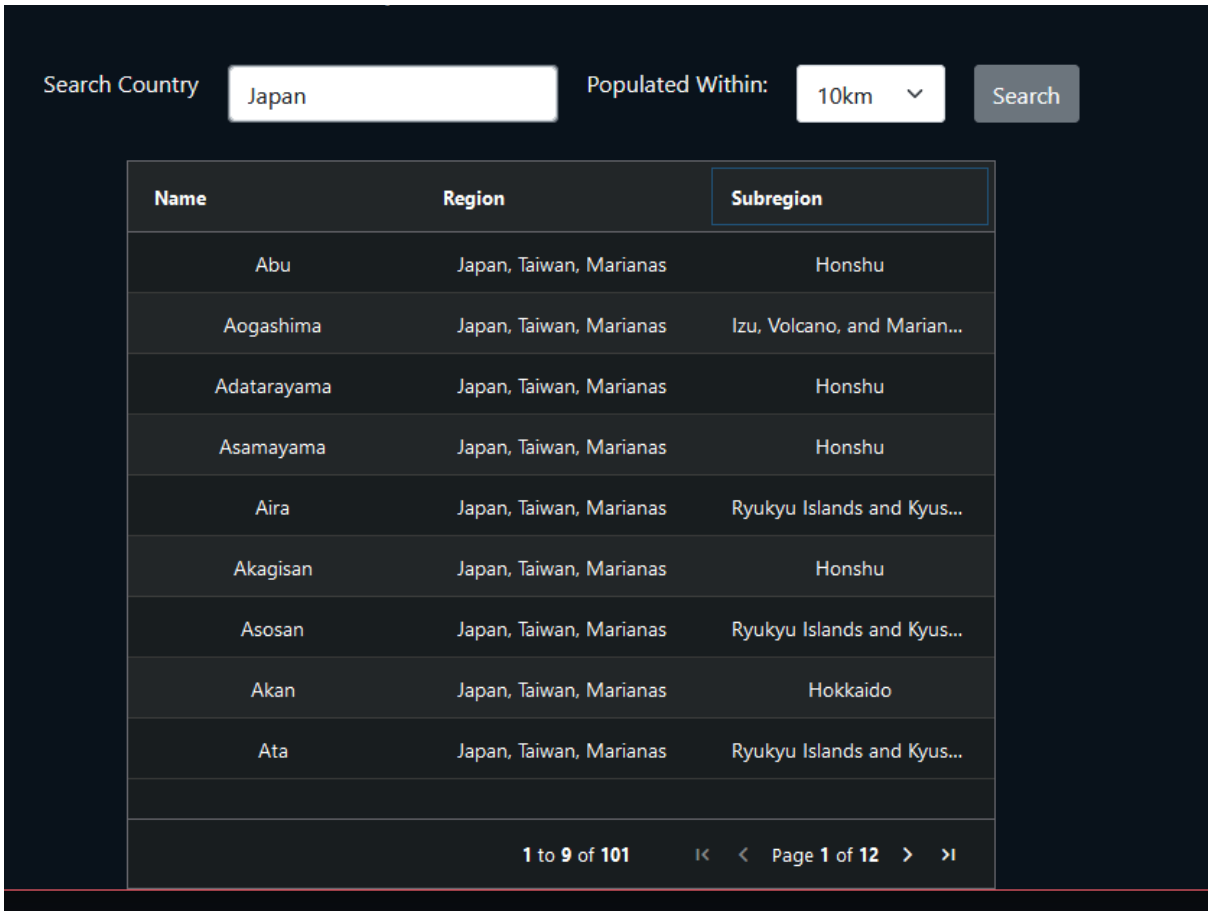


To login or register, the user must click the login button. On this page they can log in or access the register form to create and account:

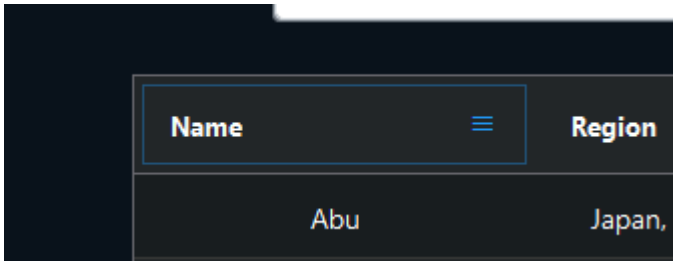


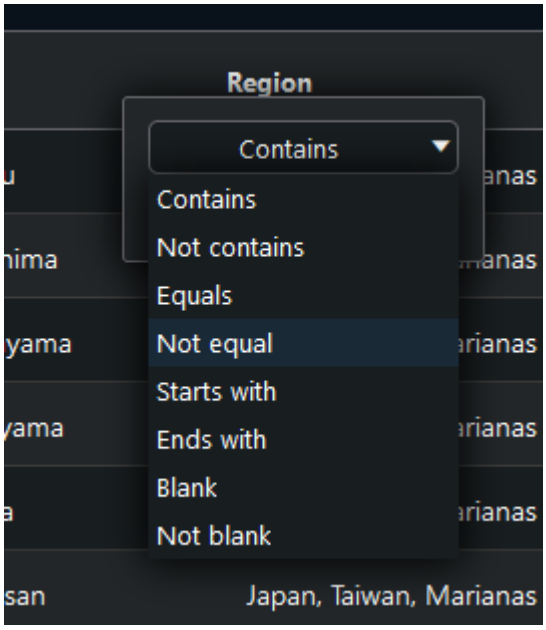
To see data about volcanoes the user must click ‘volcanoes’ on the navbar. They will see a form for selecting a country and optionally filtering by population

This works as labelled. When the user enters a country and clicks search they will see a table:

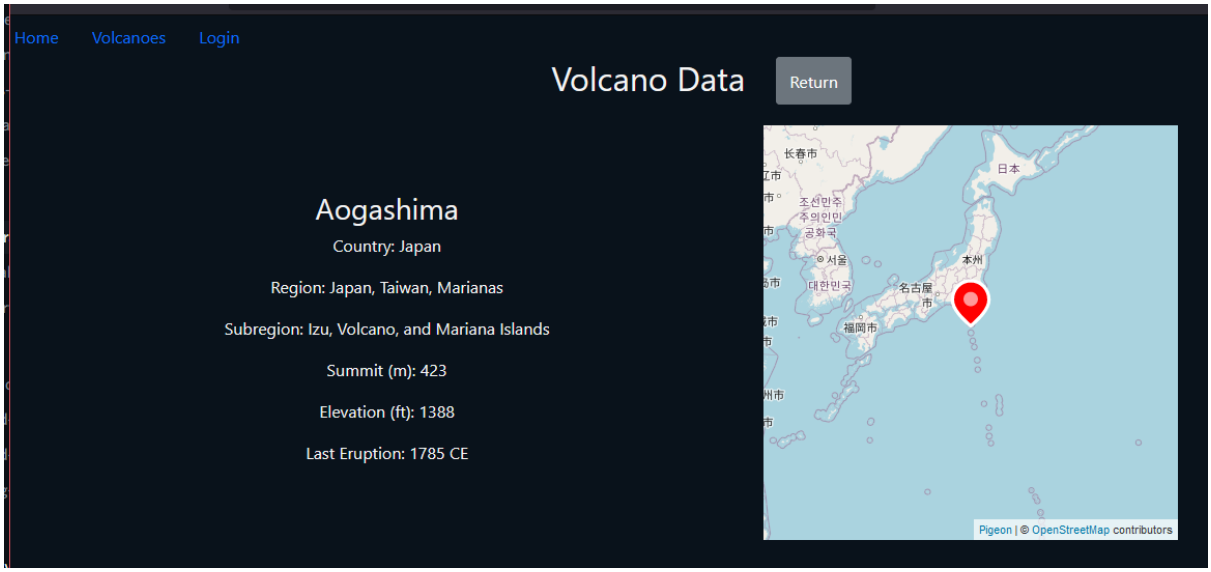


Clicking on the table headers will toggle the sorting for each column. Mousing over will show a burger menu that can be used to filter results:





Clicking a row will take the user to an information page about that particular volcano. If the user is logged in, they will see a chart showing population density.



When logged in, the login button will be replaced by a logout button on the navbar.

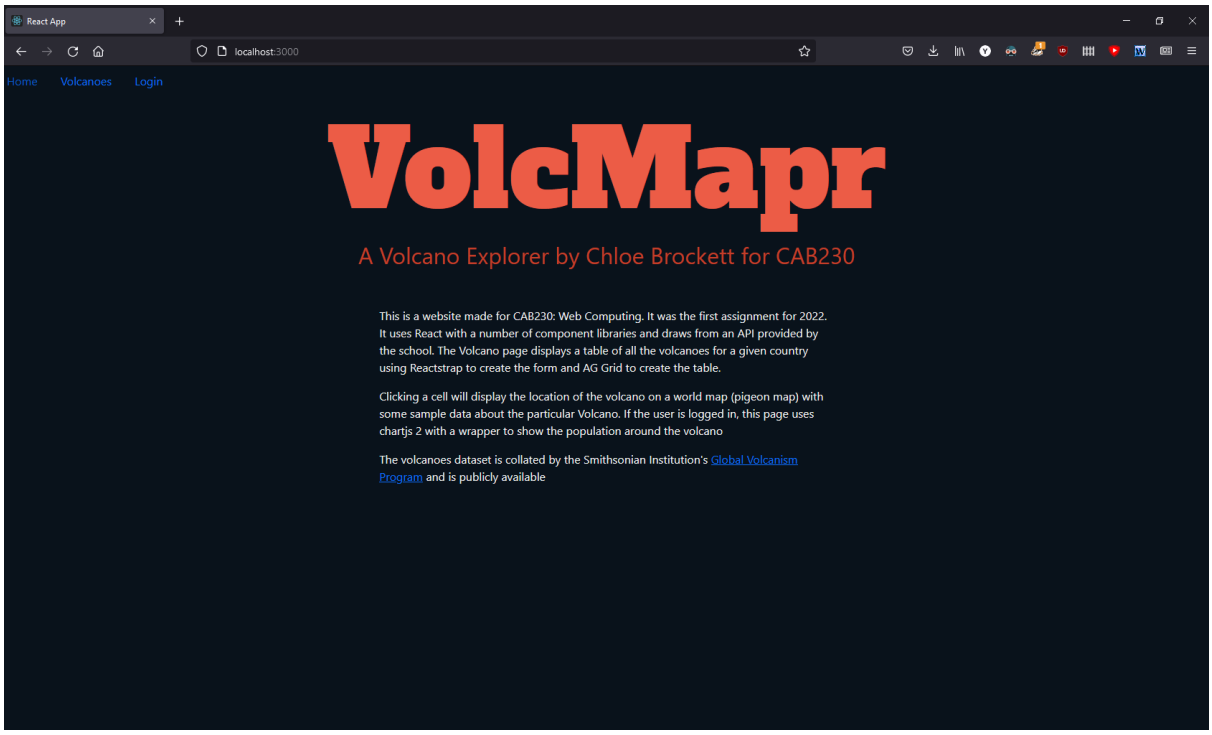
References

Global Volcanism Program, 2013. Volcanoes of the World, v. 4.10.5 (27 Jan 2022). Venzke, E (ed.). Smithsonian Institution.

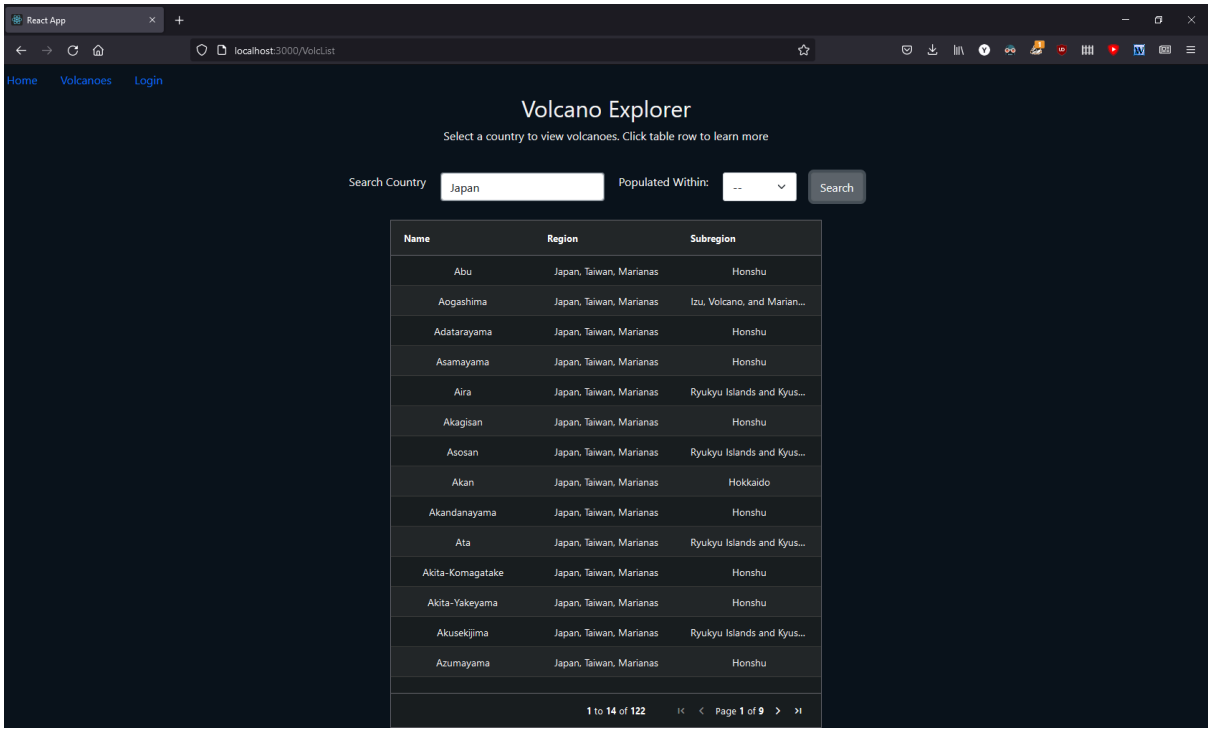
Appendices as you require them

Appendix A Tests

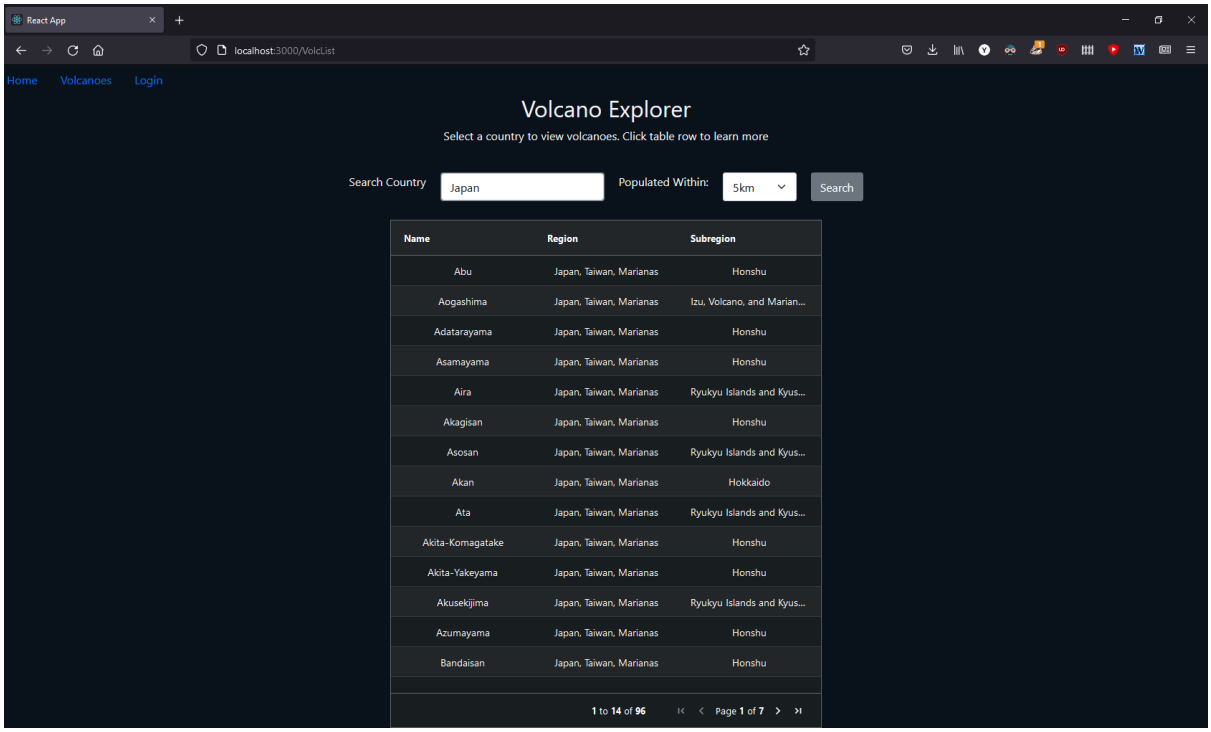
01



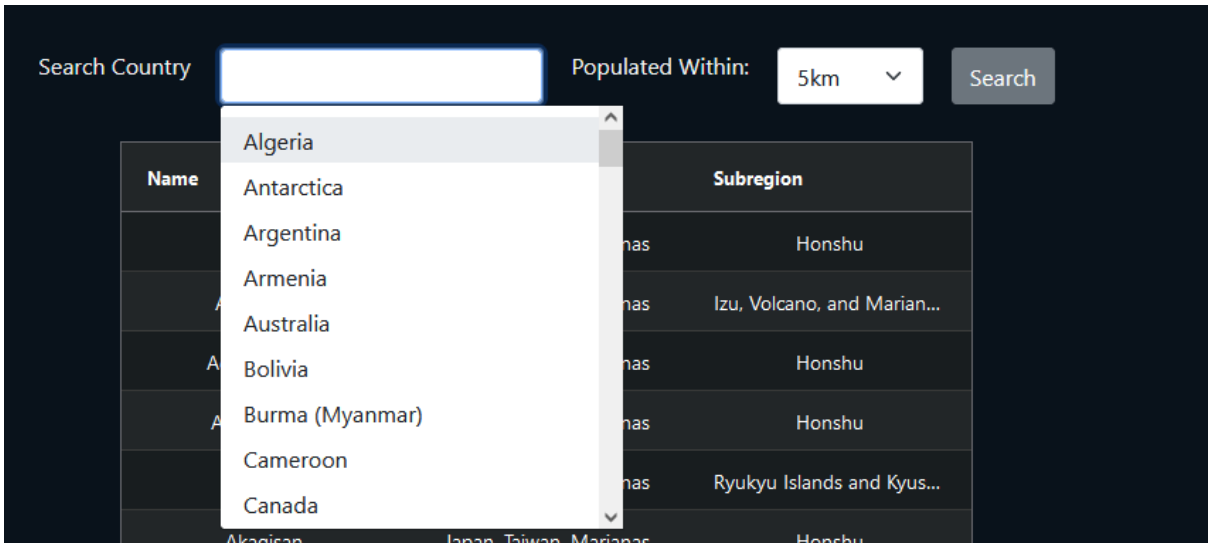
02:



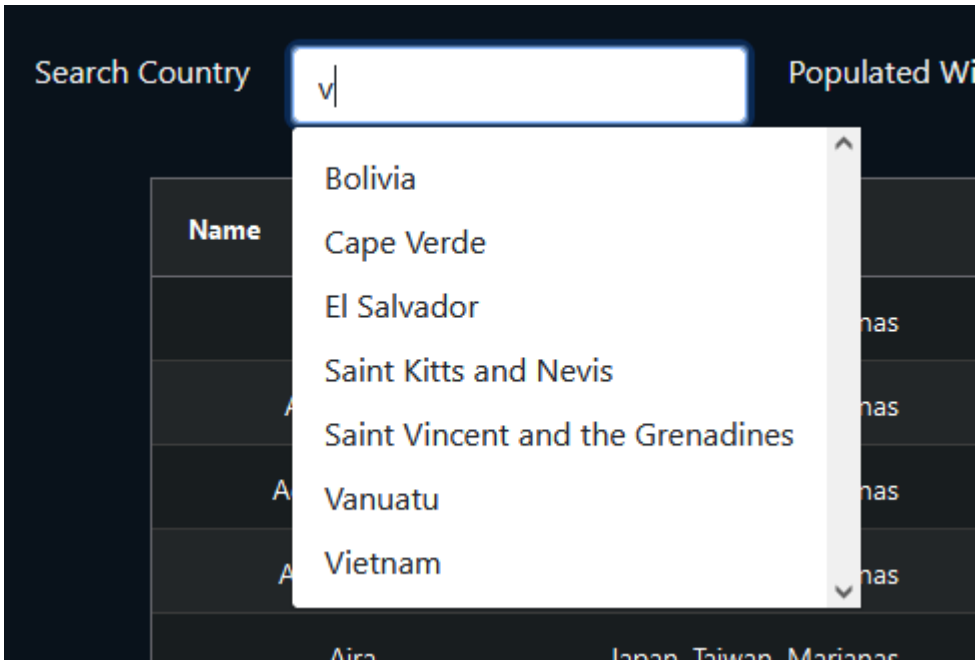
03: (note reduced pages from appendix a 02)



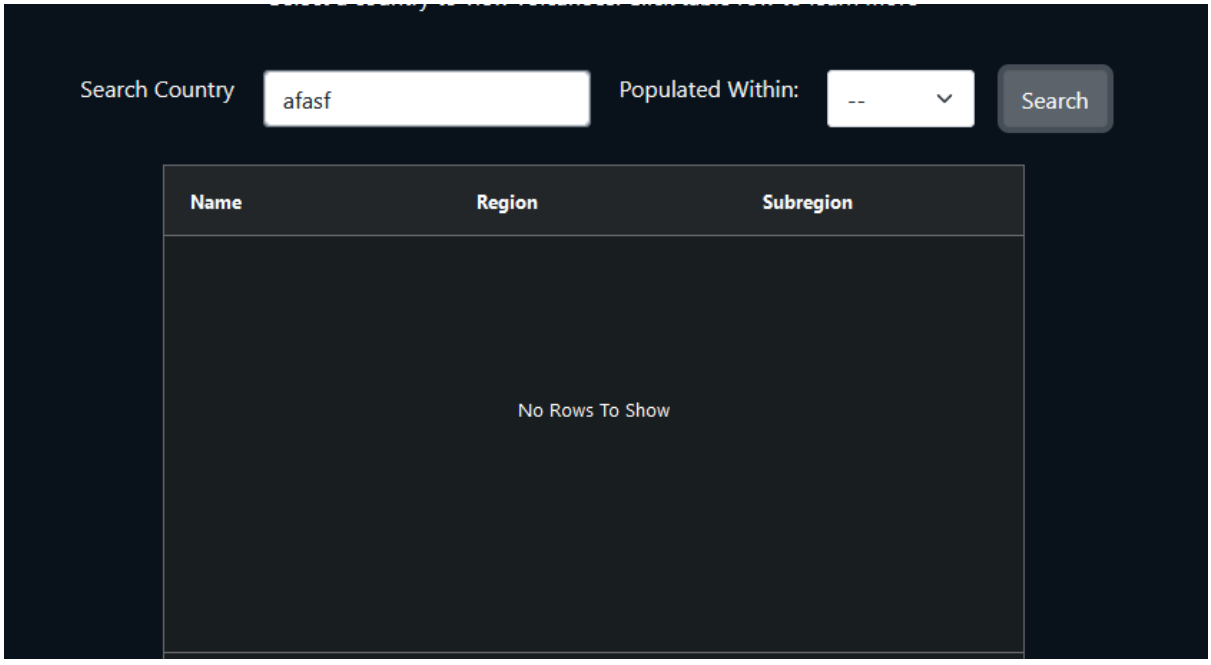
04



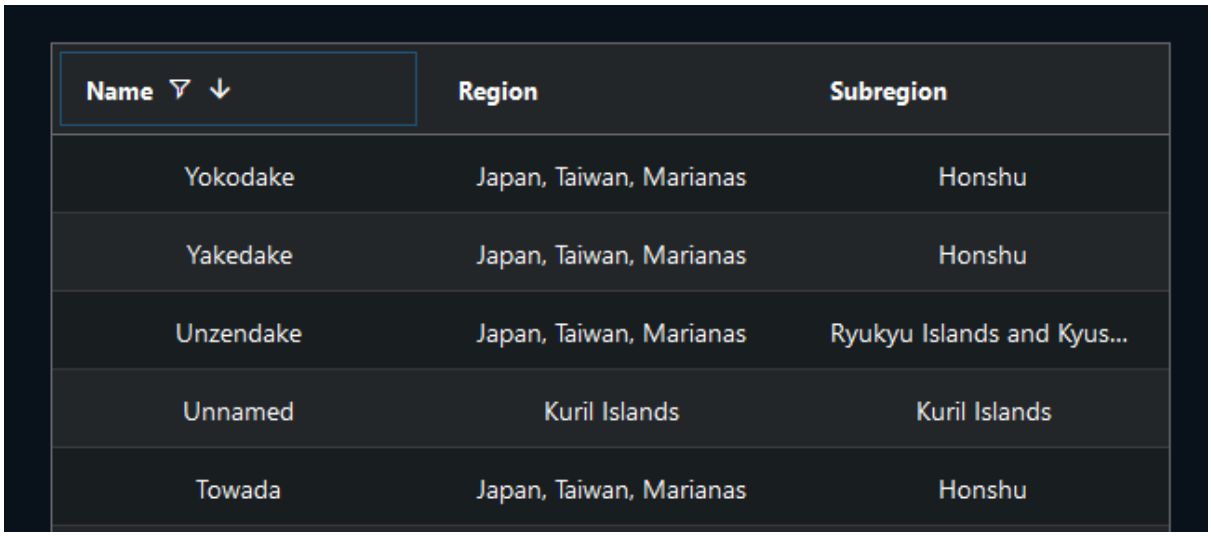
05


Search Country
v
Populated Wi
Name
Bolivia
Cape Verde
El Salvador
Saint Kitts and Nevis
Saint Vincent and the Grenadines
Vanuatu
Vietnam

06

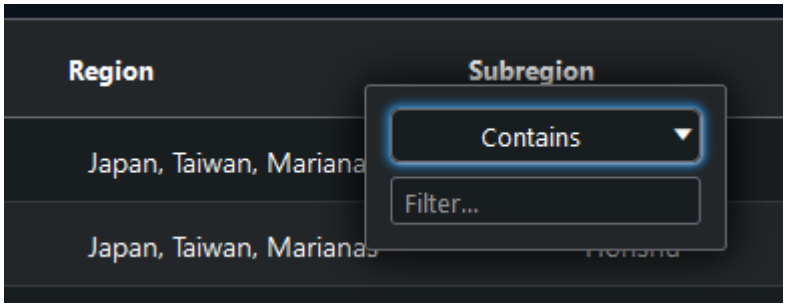

Search Country
afasf
Populated Within:
--
Search
Name
Region
Subregion
No Rows To Show

07



Name	Region	Subregion
Yokodake	Japan, Taiwan, Marianas	Honshu
Yakedake	Japan, Taiwan, Marianas	Honshu
Unzendake	Japan, Taiwan, Marianas	Ryukyu Islands and Kyus...
Unnamed	Kuril Islands	Kuril Islands
Towada	Japan, Taiwan, Marianas	Honshu

08



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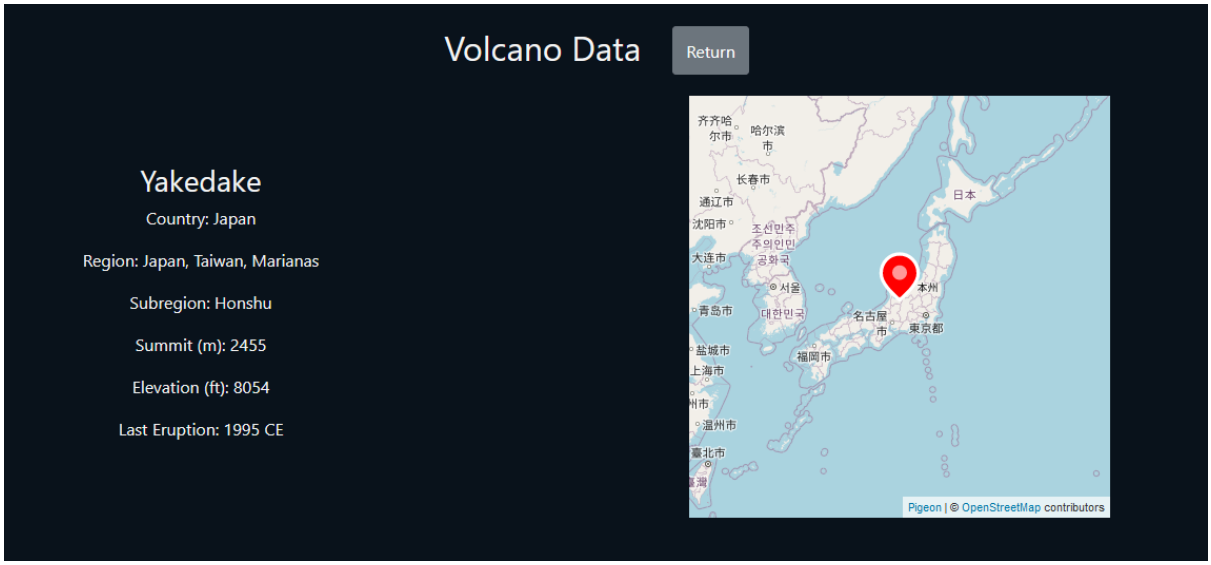
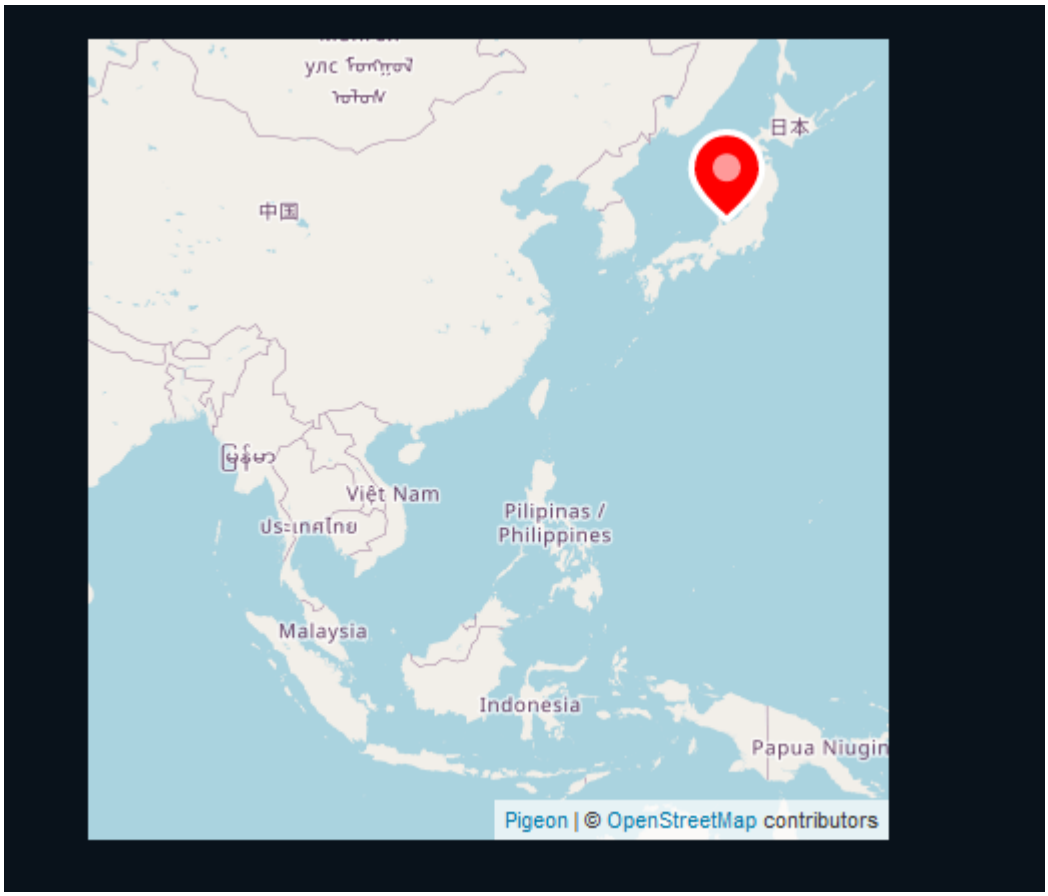
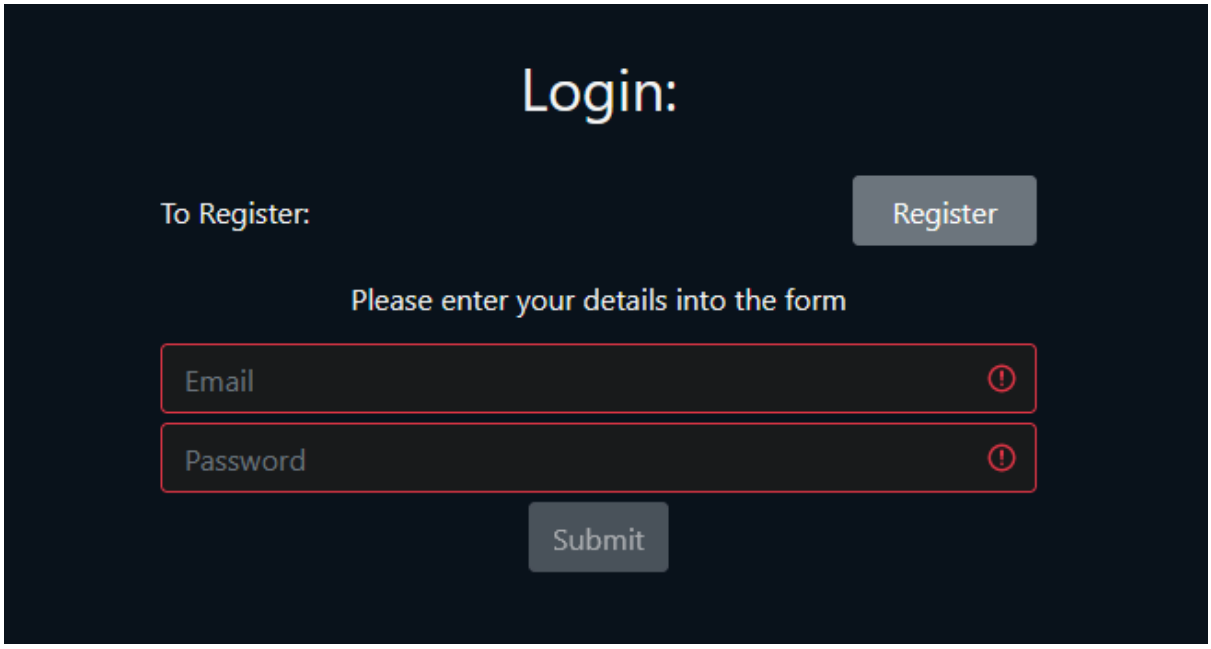


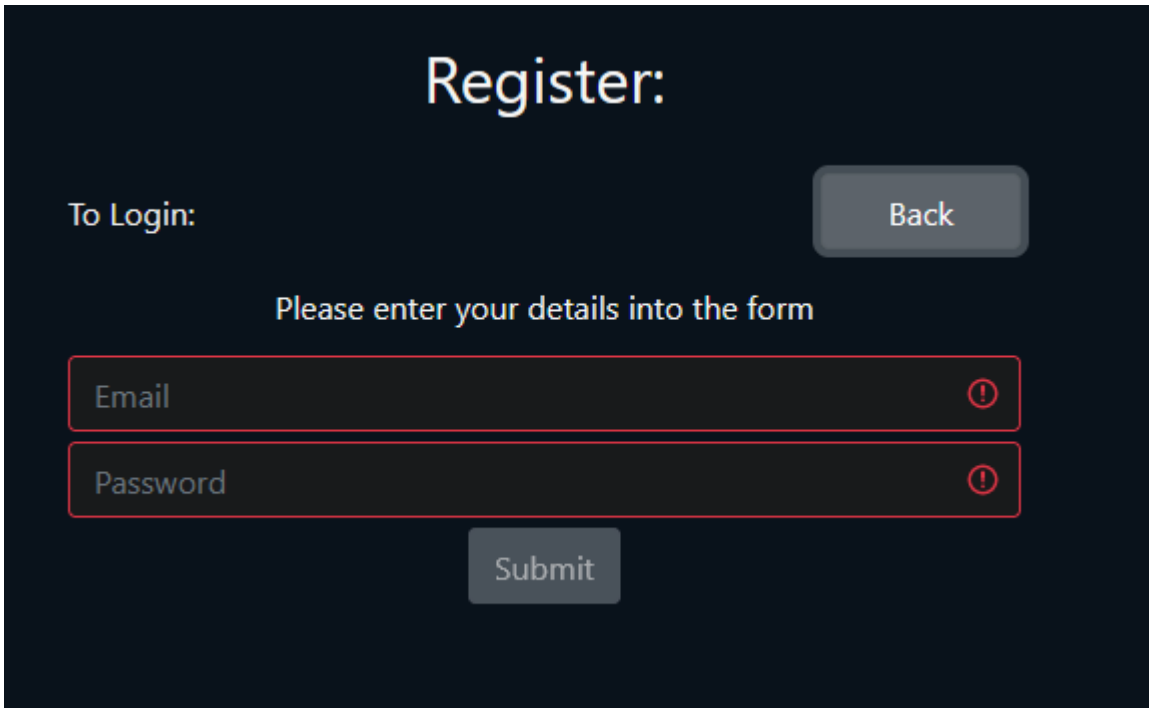
10


日本
中国
Việt Nam
Pilipinas /
Philippines
Malaysia
Indonesia
Papua Niugin
Pigeon | © OpenStreetMap contributors

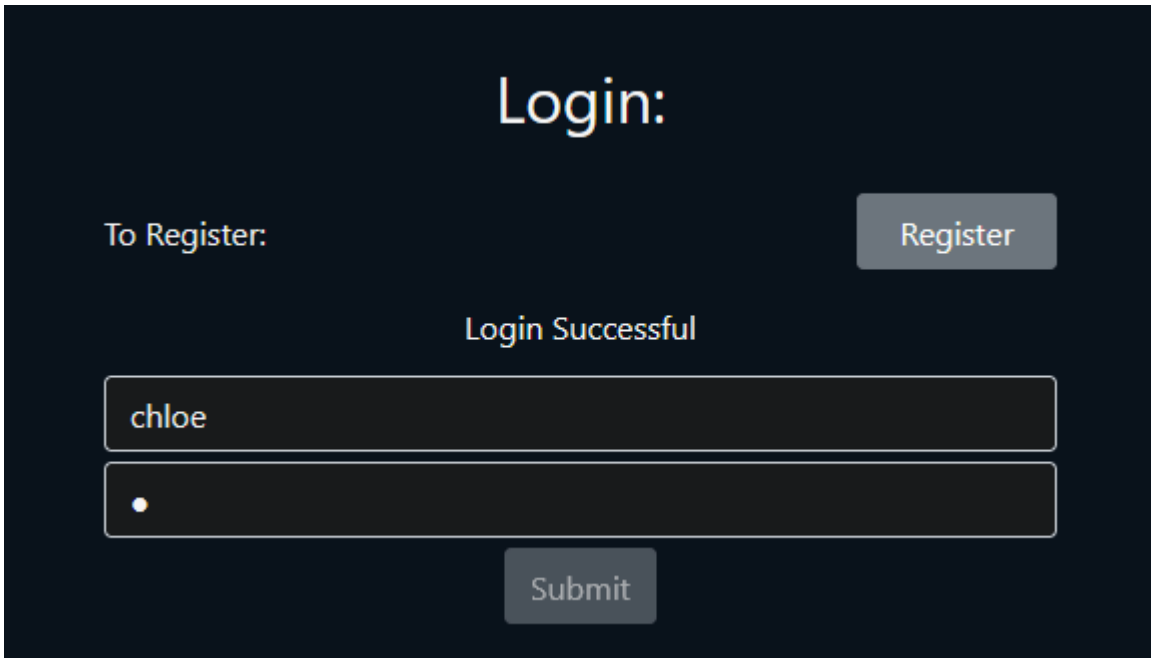
11


Login:
To Register:
Register
Please enter your details into the form
Email
Password
Submit

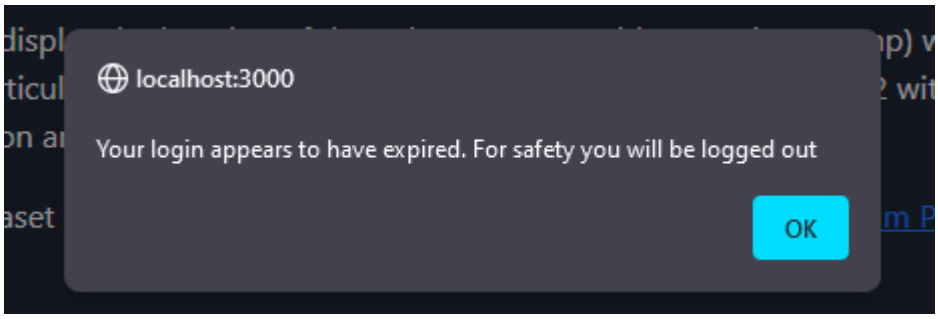
12


Register:
To Login:
Back
Please enter your details into the form
Email
Password
Submit

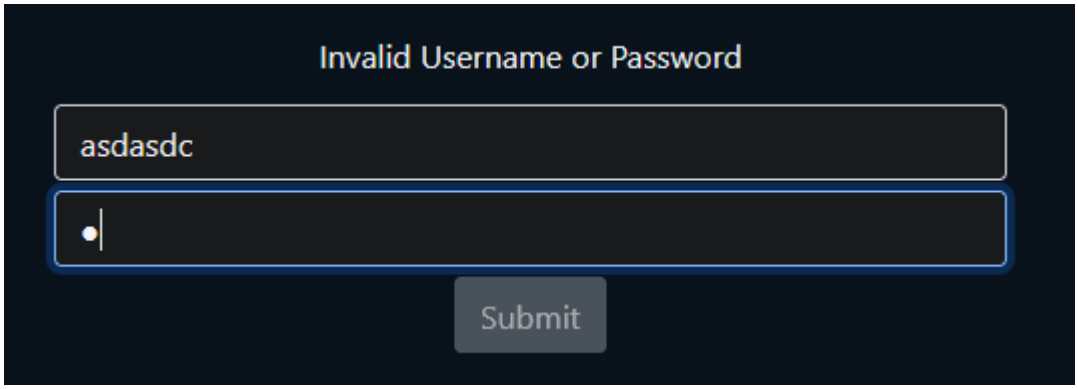
13


Login:
To Register:
Register
Login Successful
chloe
Submit

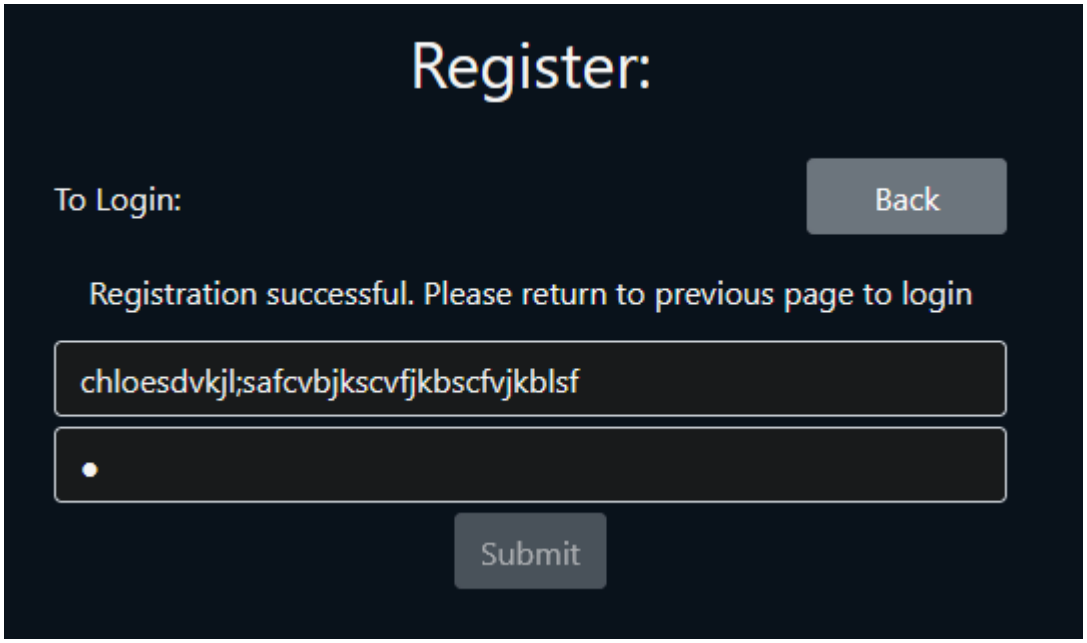
14


localhost:3000
Your login appears to have expired. For safety you will be logged out
OK

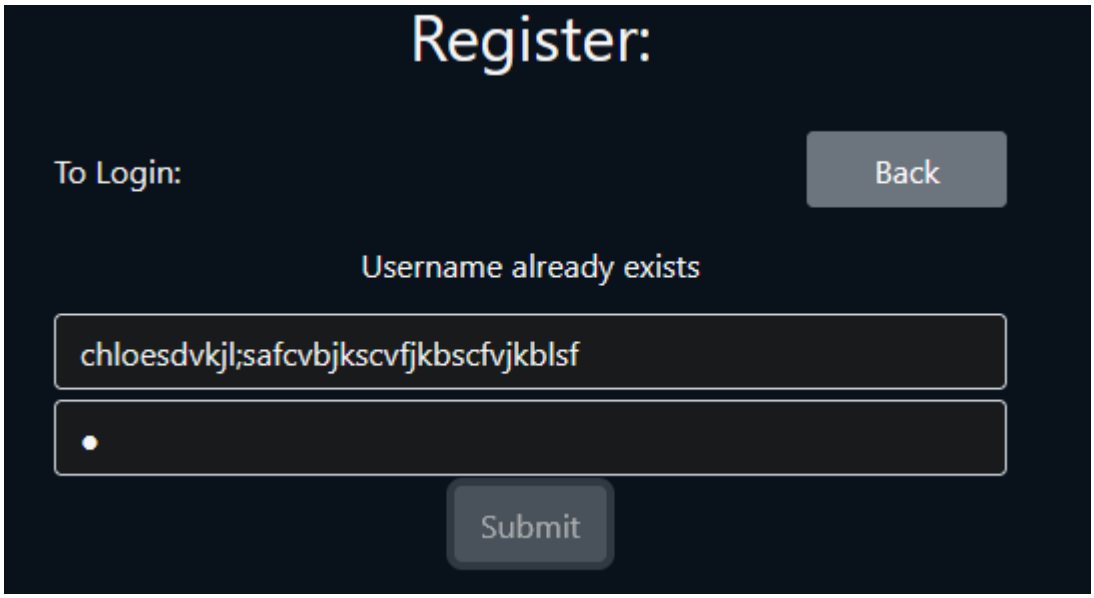
15


Invalid Username or Password
asdasdc
Submit

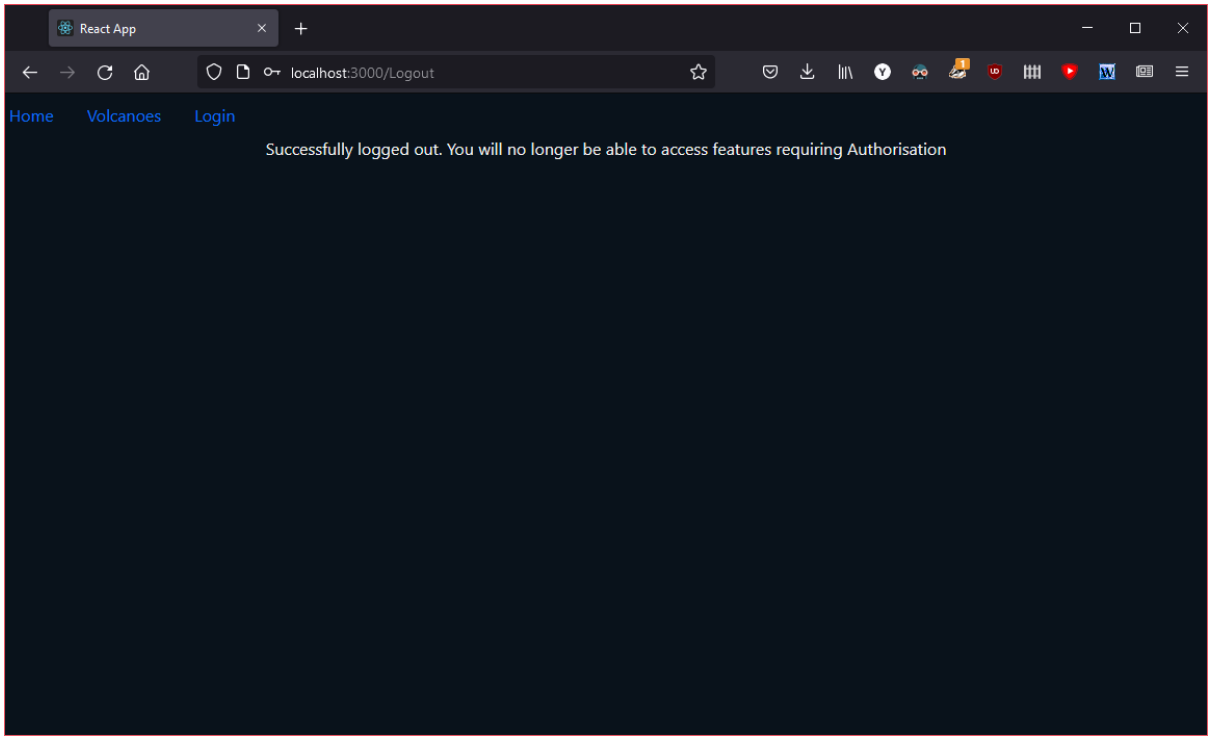
16


Register:
To Login:
Back
Registration successful. Please return to previous page to login
chloesdvkjl;safcvbjkscvfjkbscfvjkblsf
Submit

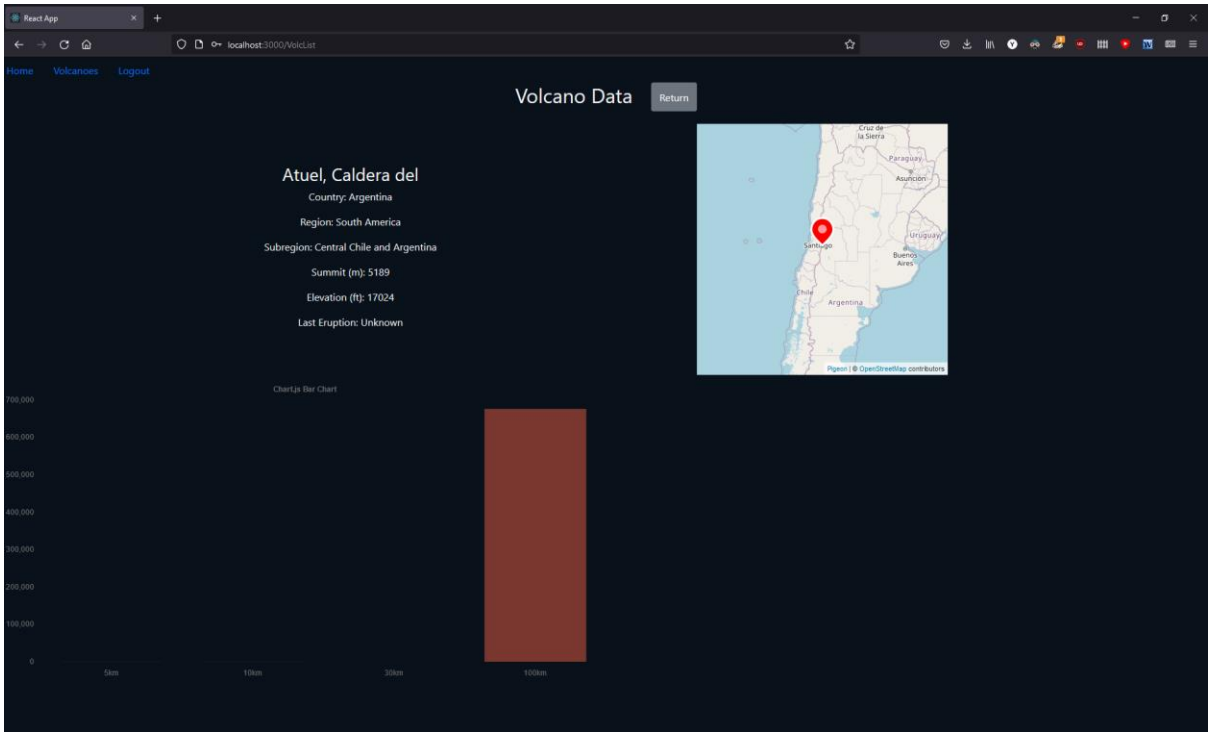
17


Register:
To Login:
Back
Username already exists
chloesdvkjl;safcvbjkscvfjkbscfvjkblsf
Submit

18


React App
localhost:3000/Logout
Home
Volcanoes
Login
Successfully logged out. You will no longer be able to access features requiring Authorisation

19


React App
localhost:3000/VolcList
Home
Volcanoes
Logout
Volcano Data
Return
Atuel, Caldera del
Country: Argentina
Region: South America
Subregion: Central Chile and Argentina
Summit (m): 5189
Elevation (ft): 17024
Last Eruption: Unknown
Cruz de la Sierra
Paraguay
Asunción
Uruguay
Santiago
Buenos Aires
Chile
Argentina
Pigeon | © OpenStreetMap contributors
ChartJs Bar Chart
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
5km
10km
30km
100km