

2024

CAB230 Assignment 2 Client Side



CAB230

Volcano API – Client Side
Application

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Introduction

Purpose & description

This React based client-side web application shows geographical data about volcanoes around the world using a REST API and displays more detailed information if the user is authorised. It shows all volcanoes in a selected country depending on the filter, and this search can be further narrowed by specifying volcanoes that are populated within 5, 10, 30, or 100 km. The user can use filters to see a table of volcanoes and each individual volcano's information with and without authorisation. The information includes a list of name, region, subregion, last eruption, summit, and elevation of the volcano, and a map showing the location of the volcano. When the user is authenticated, the page also shows a bar graph of its population density.

One standout feature of this application is the user experience and UI design. The application was carefully designed to look the best it could using a combination of custom CSS and a design framework (Bootstrap). Although the visual design does not affect the grade for this assignment, effort was made to make it prettier and easier to use the application.

The application uses the module ag-grid-react to make tables look and behave better, and Bootstrap to make the application look better and unify the design. In addition, in order to make this application more efficient, it uses the modules called react-router-dom for routing and navigation, chart.js for a bar chart of population density, and pigeon-maps for implementing a map without a lot of dependency uses.

[Home](#) [Volcano List](#) [Register](#) [Login](#)

Volcanoes of the World



Searching Volcanoes

Country:

Name	Region	Subregion
Abu	Japan, Taiwan, Marianas	Honshu
Aogashima	Japan, Taiwan, Marianas	Izu, Volcano, and Mar
Adatarayama	Japan, Taiwan, Marianas	Honshu
Asamayama	Japan, Taiwan, Marianas	Honshu
Aira	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akagisan	Japan, Taiwan, Marianas	Honshu
Asosan	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akan	Japan, Taiwan, Marianas	Hokkaido
Ata	Japan, Taiwan, Marianas	Ryukyu Islands and Ky

Page Size:

1 to 10 of 96

<

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Page 1 of 10

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Completeness and Limitations

This application completed all requirements of this assignment. This application's nav bar has a logout button instead of the login and register buttons when the user is logged in, and it shows a bar chart of population density only when the user is logged in. All other features outlined in the specification also work correctly. If I am forced to mention the limitation of the application, user interface and user experience designs of this application could be better. This application could have popup-messages to ensure when a user wants to logout and when a user is using an authenticated version of this application.

Use of End Points

[*/countries*](#)

In order to get names of country for the dropdown, this endpoint was used.

Searching Volcanoes

Country: ✓ Algeria

Name

- Antarctica
- Argentina
- Armenia
- Australia
- Bolivia
- Burma (Myanmar)
- Cameroon
- Canada
- Cape Verde
- Chad
- Chile
- China
- Colombia
- Comoros
- Costa Rica
- Djibouti
- Dominica
- DR Congo
- Ecuador
- El Salvador
- Equatorial Guinea
- Eritrea
- Ethiopia

Page : 5 | Page ▲

</volcanoes>

In order to get “populated within km” data about volcanoes of each country for the dropdown, this endpoint was used.

Searching Volcanoes

Country: ✓ 5

10

30

100

Search

Name | Region | Subregion

</volcano/{id}>

This endpoint was used to get individual data about each volcano including a map and a bar chart table.

Manzaz Volcanic Field

Country: Algeria

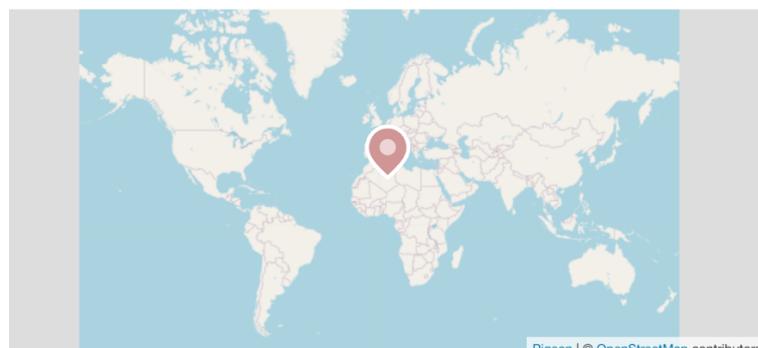
Region: Africa and Red Sea

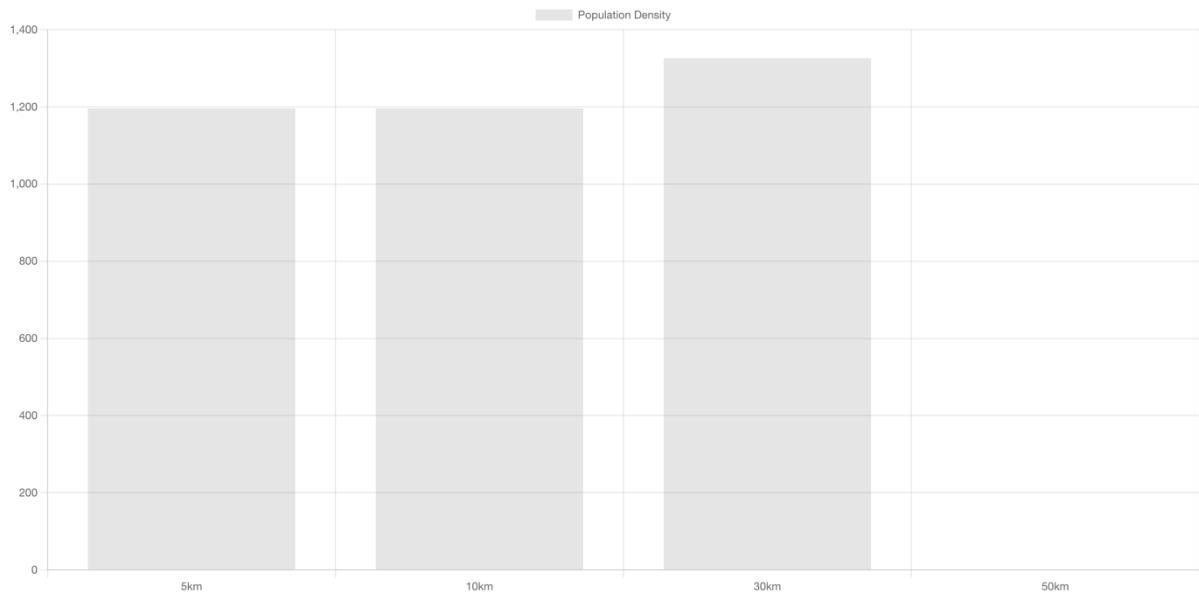
Subregion: Africa (northern)

Last Eruption: Unknown

Summit: 1672 m

Elevation: 5486 ft





[*/user/register*](#)

This endpoint was used for registering new users, or checking whether the user is already registered or not so this application can send an error message to the user.

Register

Error! User already exists

Email:

Password:

[Register](#)

[*/user/login*](#)

This endpoint was used for logging the user in, checking whether the user is already exists or not and whether the user inputs are correct or not. Therefore, this application can send an error message for the user to register first, or if the inputs are wrong.

Login

Error! Incorrect email or password

Email:

Password:

[Login](#)

[New around here? Sign up](#)

Modules Used

ag-grid-react

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

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

react-router-dom (useNavigate and useParams)

A module to enable the developer to add dynamic routing in a web app – showing pages and allowing the users to navigate them.

<https://www.npmjs.com/package/react-router-dom>

pigeon-maps (Map and Makers)

A module to allow developers to implement a map without external dependencies and provide a performance-first React-centric extendable map engine.

<https://www.npmjs.com/package/pigeon-maps>

chart.js (ChartJS, CategoryScale, BarElement, Title, and Legend)

Modules to create HTML-based charts simply.

<https://www.npmjs.com/package/chart.js?activeTab=readme>

react-chartjs-2 (Bar)

A module to create HTML-based charts with the module chart.js as React components.

<https://www.npmjs.com/package/react-chartjs-2>

reactstrap (Container)

Modules to allow developers to use Bootstrap 5 components in React. Reactstrap is a library for a bootstrap-based React UI.

<https://www.npmjs.com/package/reactstrap>

ag-grid-community

‘ag-grid-community/styles/ag-grid.css’
‘ag-grid-community/styles/ag-theme-quartz.css’
‘ag-grid-community/client-side-row-model’ (ClientSideRowModelModule)
‘@ag-grid-community/core’ (ModuleRegistry))

Modules to help to display tables.

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

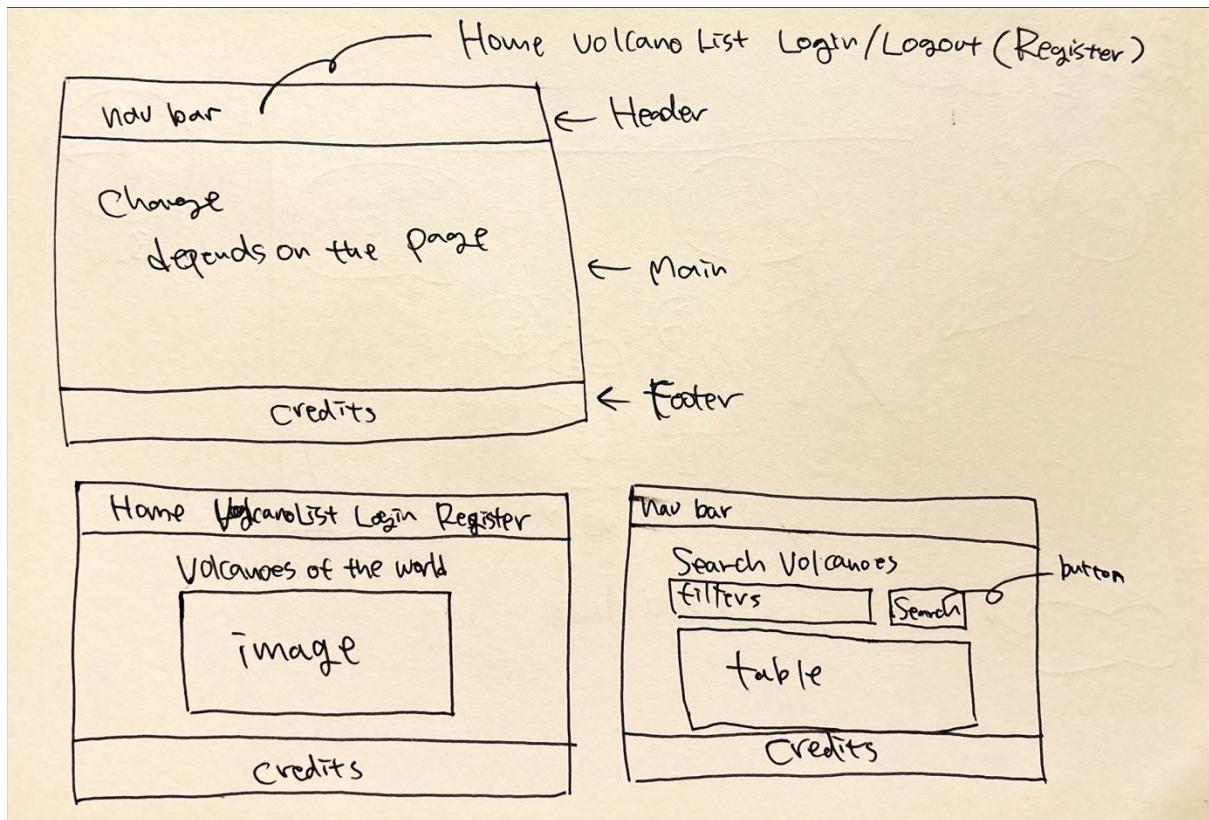
Application Design

Navigation and Layout

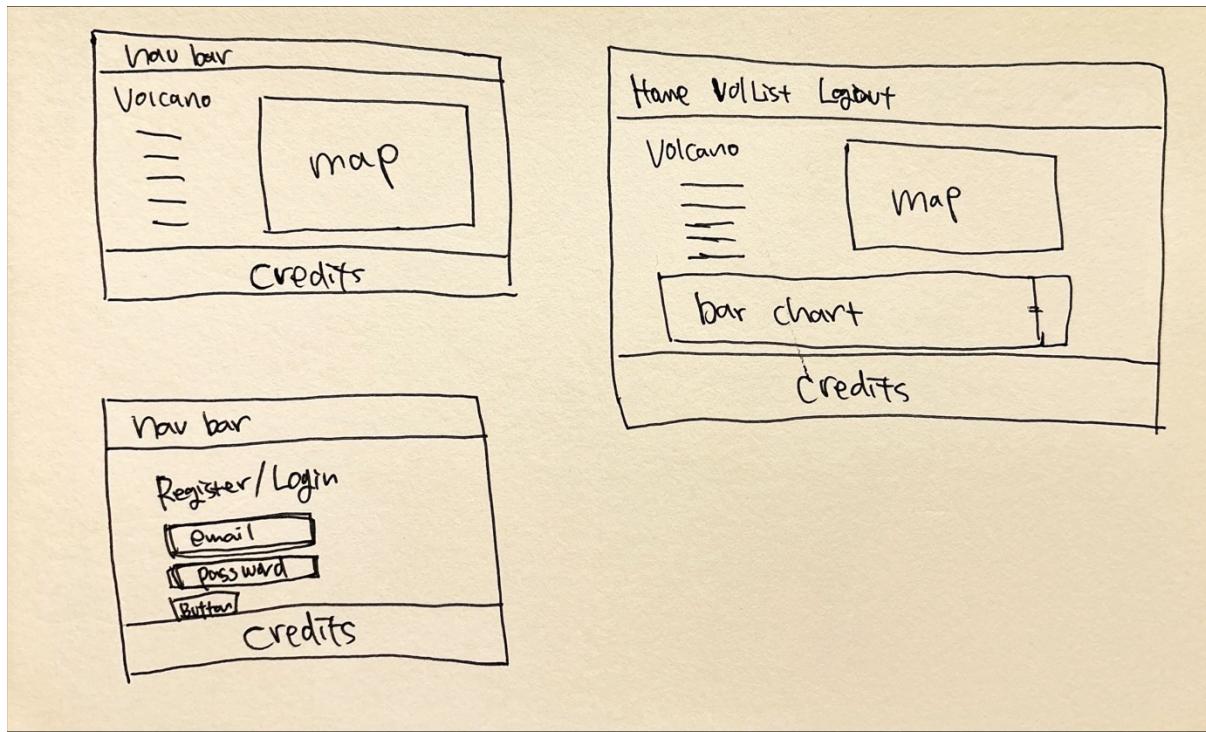
This layout design was decided based on design-mock-ups which are pasted below. The use of application's main colour scheme is the combination of #03256C and #FFFFFF. The most use of colours is blue because the colour blue helps to make reading more comprehensible (Fagoyinbo, 2023). Therefore, the colour of images and buttons used were also blue.

The decision of this navigation design, the menu items and the flow between screens, was developed as a nav bar component. Thus, this application shows the nav bar every time the user opens another page. The nav item login and register are only showed when the user is not logged in. The nav var item logout is only showed when the user is already logged in.

The top sketch on the first scan is a template format for all pages. The left below sketch on the first scan is the home page which includes a header and image for the main. The right bottom sketch on the first scan is a page which shows a table of volcanoes based on filters. This page contains a header, two filters, a button, and a table.



The left top sketch on the second scan is a page which shows selected volcano from the table when the user is not authenticated. The main part includes a header, lists, and a map. The right top sketch on the second scan is the same page as the left top one, but the page appears only when the user is authenticated. The main contains a header, lists, a map, and a bar chart. The bottom sketch on the second scan is for login and register page. The main part includes a heading, two labels of the inputs, two inputs, and a button.



Usability and Quality of Design

The general design of the website is well organised and easily readable. First, the navigation bar is simple and dynamic, with only a few items and only displaying the relevant items for a given user (i.e. only displaying the login, logout, and register buttons when they are relevant). In addition, when the user tries to press a nav item or any other button or link, the CSS changes on click, giving the user feedback that they have pressed the button.

Secondly, the visual design is consistent across screens because of unified uses of fonts and colours. The number of the font use is just one which is Arial, Helvetica, sans-serif. In addition, the font size for regular text is consistent at 16px, while headings on each page are consistent at 30px. Moreover, there are just 3 colours used in the design of this application. Therefore, the design of this application is unified and easier and stress-free to see for any users.

Finally, the application builds on the common design of other websites to give an experience that is consistent with existing user expectations. For example, having the main navigation at the top of the screen on a horizontal bar, having a large header for each page, having labels for form inputs, having a password input that obscures user input, and the design of the search filters. All of these aspects are consistent with many other websites' designs and create a feeling of comfort with the user since they are used to these conventions.

Accessibility

To evaluate the accessibility of my website, W3C's Priority 1 checklist was used (W3C, 1999). However, all nav bar links and each row form a table do not provide the text equivalent. Moreover, the table, map, and bar chart do not provide that either. This is because I did not know how to do that, and I did not have enough time to work on this issue.

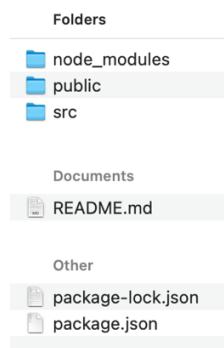
- The website fulfills the requirement of providing text equivalents for all images and user inputs with ‘alt’ descriptions, and of making buttons accessible with ‘accesskey’.
- To ensure that all information conveyed with colour is also available without colour, the application only uses black, dark blue, and white. In addition, this application shows red error message, but this is surrounded by a border. The colour of each link is different but there is a hyperlink, under line, on the link text as well. There are enough gaps with margin between objects, so it is easier to see for people with colour deficiencies or by those with low resolution monitors.
- The website displays all information in English, and thus there are no changes to the natural language of the document and no need for additional lang attributes.
- The website is organised to be readable without stylesheets.
- The website does not contain dynamically changing content, so it automatically fulfills the requirement to update text equivalents of any dynamic content.
- The website does not contain flickering content or other content that may trigger epileptic seizures, so it automatically fulfills the requirement to avoid screen flickering without configuration.
- This application uses the simplest and clearest language appropriate for the site’s content.
- This application uses a package, ag-grid-react, which does not identify row and column headers and uses div tags instead. Thus, it does not satisfy the check list for use of accessible tables.

Overall, the website fulfills 7 out of 8 items on the W3C priority 1 checklist, with the only accessibility feature not fulfilled being one caused by a third-party package recommended by the requirement sheet.

Technical Description

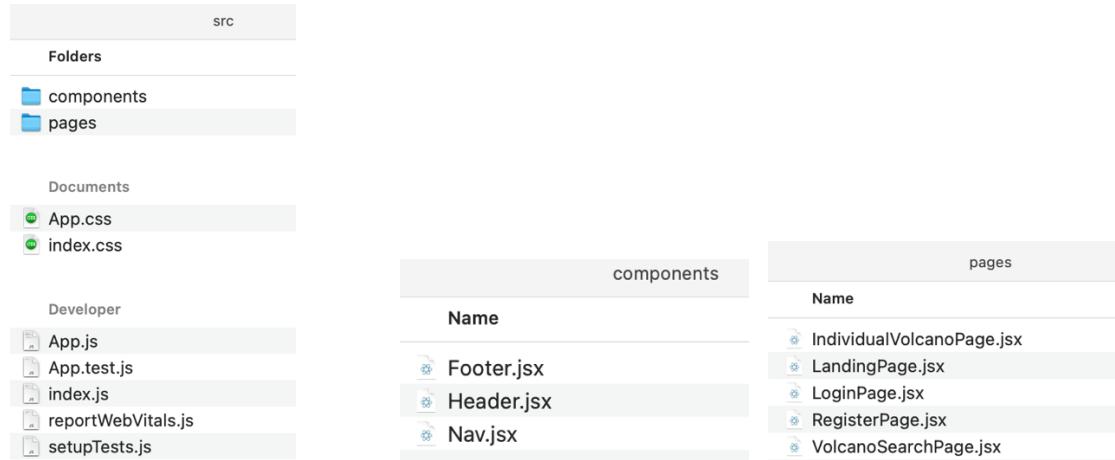
Architecture

This application is architected with three subdirectories and three documents. The three directories are node-modules directories, which include dependencies for this application development, public directory, which stores images, and src directory. The three documents are README.md, which is a simple description of the application, package-lock.json and package.json which store a list of installed dependencies and libraries for developing this application.



Inside the src directory, there are two directories, components and pages. These directories were spited based on the frequency of use. The components folder include footer, header, and nav bar components, templates for all pages. Each page of this application is structured with a header including a nav bar, main content, and footer from the top, and the main content differs depending

on the page. This structure is written and controlled with the App.js file. Therefore, the template is very helpful and beneficial to developing each page, and that prevents writing the same code again and again. On the other hand, inside the pages directory, there are six pages, and all controlled by the App.js file. These pages are what is rendered as the main content.



Test Plan

Task	Expected Outcome	Result	Screenshot/s (Appendix B)
Register with empty inputs	Show error message and stays in the same page	PASS	1
Register with my info	Succesfully registerd and move to the main page	PASS	2
Register with already used email	Show error message and stays in the same page	PASS	3
Login with empty input	Show error message and stays in the same page	PASS	4
Login wirh my info which registerd	Succesfully registerd and move to the main page	PASS	5
Login wirh my email address which registerd with wrong password	Show error message and stays in the same page	PASS	6
Login with unregisterd email address	Show error message and stays in the same page	PASS	7
Click Logout nav link (when its loged in)	Show the landing page with 4 nav links (Home, Login, Register, Volcano List)	PASS	8
Click Login nav link (when it's not registered and loged in)	Show the login page requiring inputs of email address and passwprd	PASS	9
Click Register nav link (when it's not registered and loged in)	Show the register page requiring inputs of email address and passwprd	PASS	10
Click Volcano List nav link	Show the volcano list page which has 2 dropdown filters and a table	PASS	11
Click Home nav link	Show the landing page which has a title and image of volcano	PASS	12
On the Volcano list page change only country filter without login	Show a table of the filtered country and populated within 5 km of volcanoes	PASS	13
On the Volcano list page change only country filter with login	Show a table of the filtered country and populated within 5 km of volcanoes	PASS	14
On the Volcano list page change only kilo filter without login	Show a table of Algeria and filtered populated within 5 km of volcanoes	PASS	15
On the Volcano list page change only kilo filter with login	Show a table of Algeria and filtered populated within 5 km of volcanoes	PASS	16
On the Volcano list page change both filters without login	Show a table of the filtered country and filtered populated within km of volcanoes	PASS	17
On the Volcano list page change both filters with login	Show a table of the filtered country and filtered populated within km of volcanoes	PASS	18
After a search button pressed, click a row of volcano info when logedin	Shows a list of volcano info, map, and bar table with actual data	PASS	19
After a search button pressed, click a row of volcano info when not logedin	Shows a list of volcano info and map with actual data	PASS	20

Difficulties / Exclusions / unresolved & persistent errors

One of the biggest roadblocks I encountered was figuring out how to load in the API data to the React state. At first, I didn't understand how React state worked, and especially didn't understand how I should fetch the country data, since it is required for the dropdown on page load. It was hard to write the code even after checking lectures and practicals, and this required me to google about this and follow various online tutorials.

The other major difficulty was storing and using the authentication token. It took me a while to figure out how to use localStorage, and then I had a problem because I had put the entire token object into the localStorage instead of just the token string. I resolved this by studying the lecture slides and using console.log to debug the application and see what why the token was being considered invalid.

There are no unresolved errors on this web application.

Extensions

An extension, potential future extension and improvement for this application could be making it more user friendly.

On the login and register page, there is just two input boxes and a button. It is possible to know the user is logged in from the nav bar since it shows logout button instead of login and register buttons. However, it is hard for the user to know if they are logged in or not. Thus, when they are login, this application could be better if it showed a user icon or pop-up message that they are logged in successfully. In addition, when the user presses the logout button, it is better to make sure if the user wants to logout or not with a pop-up message.

On the list page, there is one table with results, and it is hard to tell that users can click each row of the table to see more detailed individual information about each volcano. Thus, it is better to put a hyperlink below each name of volcano.

Thus, if there was more time to improve this application, the user experience and design could be better.

User guide

1. Register with your email address and a password or login with your email address with a registered correct password.



Register

Email:

Password:

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Login

Email:

Password:

[New around here? Sign up](#)

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2. Click a nav item called volcano list.

Volcanoes of the World



localhost:3000/volcanolist

3. Set a filter of a country and a “populated within km” and click the search button.

Searching Volcanoes

Country:

Name	Region	Subregion
No Rows To Show		

Page Size:

▼

0 to 0 of 0

<

Page 0 of 0

>

Volcano Finder by Kanon

4. The table shows volcanoes of the country and populated within the kilometres.

Searching Volcanoes

Country:

Name	Region	Subregion
Abu	Japan, Taiwan, Marianas	Honshu
Aogashima	Japan, Taiwan, Marianas	Izu, Volcano, and Mari
Adatarayama	Japan, Taiwan, Marianas	Honshu
Asamayama	Japan, Taiwan, Marianas	Honshu
Aira	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akagisan	Japan, Taiwan, Marianas	Honshu
Asosan	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akan	Japan, Taiwan, Marianas	Hokkaido
Ata	Japan, Taiwan, Marianas	Ryukyu Islands and Ky

Page Size:

1 to 10 of 106

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Page 1 of 11 > >>

Volcano Finder by Kanon

Click a row of a volcano in the table.

Searching Volcanoes

Country:

Name	Region	Subregion
Abu	Japan, Taiwan, Marianas	Honshu
Aogashima	Japan, Taiwan, Marianas	Izu, Volcano, and Mari
Adatarayama	Japan, Taiwan, Marianas	Honshu
Asamayama	Japan, Taiwan, Marianas	Honshu
Aira	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akagisan	Japan, Taiwan, Marianas	Honshu
Asosan	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akan	Japan, Taiwan, Marianas	Hokkaido
Ata	Japan, Taiwan, Marianas	Ryukyu Islands and Ky

Page Size:

1 to 10 of 106

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Page 1 of 11 > >>

Volcano Finder by Kanon

5. A page shows you a list, world map, and bar chart about the selected volcano.

Aogashima

Country: Japan

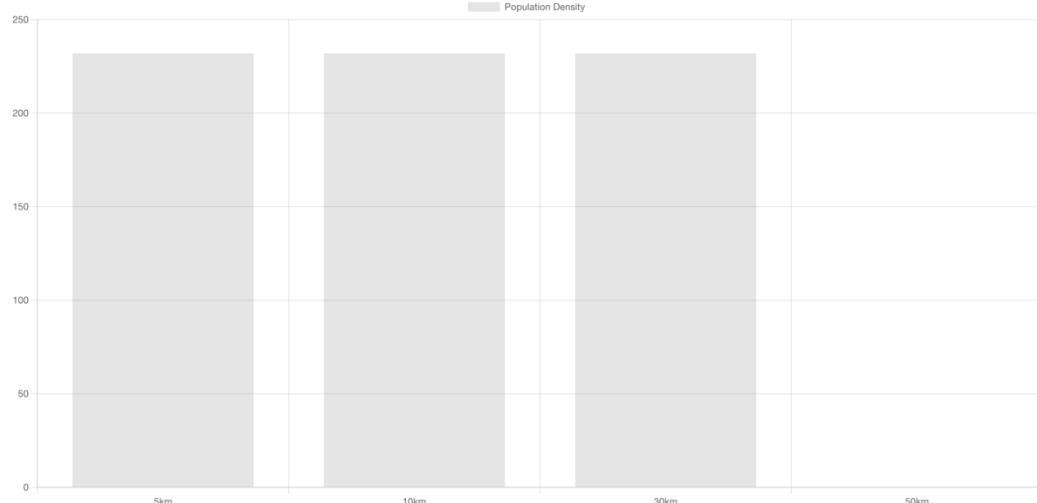
Region: Japan, Taiwan, Marianas

Subregion: Izu, Volcano, and Mariana Islands

Last Eruption: 1785 CE

Summit: 423 m

Elevation: 1388 ft

**6. You can log out whenever you need it.****Aogashima**

Country: Japan

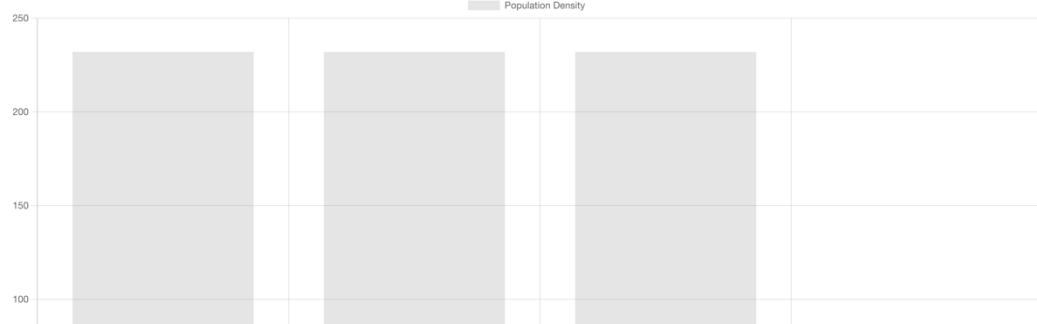
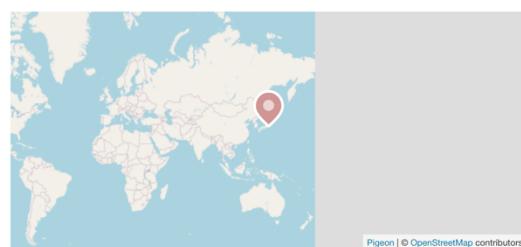
Region: Japan, Taiwan, Marianas

Subregion: Izu, Volcano, and Mariana Islands

Last Eruption: 1785 CE

Summit: 423 m

Elevation: 1388 ft



References

- Fagoyinbo, D. (2023, September 3). The Role of Color Psychology in UX Design — plus UX Color Palette Inspiration. *Medium*. <https://bootcamp.uxdesign.cc/the-role-of-color-psychology-in-ux-design-plus-ux-color-palette-inspiration-59bc64f5f05d>
- W3C. (1999). *Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0*. Retrieved May 11, 2024, from <https://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/full-checklist.html>

Appendix

[1]

The screenshot shows a dark blue header bar with navigation links: Home, Volcano List, Register, and Login. Below the header is a light gray content area. A red rectangular box highlights an error message: "Error! Request body incomplete, both email and password are required". Underneath the message are two input fields: "Email:" containing "email@example.com" and "Password:" containing "Password". At the bottom is a blue "Register" button.

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[2]

The screenshot shows a dark blue header bar with navigation links: Home, Volcano List, Register, and Login. Below the header is a light gray content area. The "Email:" field contains "kanon83vani@gmail.com" and the "Password:" field contains "...". At the bottom is a blue "Register" button.

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Volcanoes of the World



[3]

Register

Error! User already exists

Email:

kanon83vani@gmail.com

Password:

...

[Register](#)

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[4]

Login

Error! Request body incomplete, both email and password are required

Email:

email@example.com

Password:

Password

[Login](#) [New around here? Sign up](#)

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[5]

Home Volcano List Logout

Volcanoes of the World



[6]

Home Volcano List Register Login

Login

Error! Incorrect email or password

Email:

kanon83vani@gmail.com

Password:

...

[Login](#)

[New around here? Sign up](#)

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[7]

Home Volcano List Register Login

Login

Error! Incorrect email or password

Email:

abc@email.com

Password:

...

[Login](#)

[New around here? Sign up](#)

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[8]

[Home](#) [Volcano List](#) [Logout](#)

Volcanoes of the World



[Home](#) [Volcano List](#) [Register](#) [Login](#)

Volcanoes of the World



[9]



Volcanoes of the World



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[10]

Home Volcano List Register Login

Volcanoes of the World



localhost:3000/register

Home Volcano List Register Login

Register

Email:

Password:

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[11]

Home Volcano List Register Login

Searching Volcanoes

Country: 5

Name	Region	Subregion
No Rows To Show		

Page Size: 0 to 0 of 0 < Page 0 of 0 > >>

Volcano Finder by Kanon

[12]

Home Volcano List Register Login

Volcanoes of the World



[13]

Home Volcano List Register Login

Searching Volcanoes

Country:

Name	Region	Subregion
Newer Volcanics Province	Melanesia and Australia	Australia

Page Size: 1 to 1 of 1

Volcano Finder by Kanon

[14]

Home Volcano List Logout

Searching Volcanoes

Country: 5

Name	Region	Subregion
Newer Volcanics Province	Melanesia and Australia	Australia

Page Size: 1 to 1 of 1 < Page 1 of 1 > >>

Volcano Finder by Kanon

[15]

Home Volcano List Register Login

Searching Volcanoes

Country: 100

Name	Region	Subregion
Atakor Volcanic Field	Africa and Red Sea	Africa (northern)
Manzaz Volcanic Field	Africa and Red Sea	Africa (northern)
Tahalra Volcanic Field	Africa and Red Sea	Africa (northern)

Page Size: 1 to 3 of 3 < Page 1 of 1 > >>

Volcano Finder by Kanon

[16]

Home Volcano List Logout

Searching Volcanoes

Country: 100

Name	Region	Subregion
Atakor Volcanic Field	Africa and Red Sea	Africa (northern)
Manzaz Volcanic Field	Africa and Red Sea	Africa (northern)
Tahalra Volcanic Field	Africa and Red Sea	Africa (northern)

Page Size: 1 to 3 of 3 | < | Page 1 of 1 | > | >>

Volcano Finder by Kanon

[17]

Home Volcano List Register Login

Searching Volcanoes

Country: 100

Name	Region	Subregion
Abu	Japan, Taiwan, Marianas	Honshu
Aogashima	Japan, Taiwan, Marianas	Izu, Volcano, and Mari
Adatarayama	Japan, Taiwan, Marianas	Honshu
Asamayama	Japan, Taiwan, Marianas	Honshu
Aira	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akagisan	Japan, Taiwan, Marianas	Honshu
Asosan	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akan	Japan, Taiwan, Marianas	Hokkaido
Ata	Japan, Taiwan, Marianas	Ryukyu Islands and Ky

Page Size: 1 to 10 of 112 | < | Page 1 of 12 | > | >>

Volcano Finder by Kanon

[18]

Home Volcano List Logout

Searching Volcanoes

Country:

Name	Region	Subregion
Abu	Japan, Taiwan, Marianas	Honshu
Aogashima	Japan, Taiwan, Marianas	Izu, Volcano, and Mari
Aitarayama	Japan, Taiwan, Marianas	Honshu
Asamayama	Japan, Taiwan, Marianas	Honshu
Aira	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akagisan	Japan, Taiwan, Marianas	Honshu
Asosan	Japan, Taiwan, Marianas	Ryukyu Islands and Ky
Akan	Japan, Taiwan, Marianas	Hokkaido
Ata	Japan, Taiwan, Marianas	Ryukyu Islands and Ky

Page Size: 1 to 10 of 112

Volcano Finder by Kanon

[19]

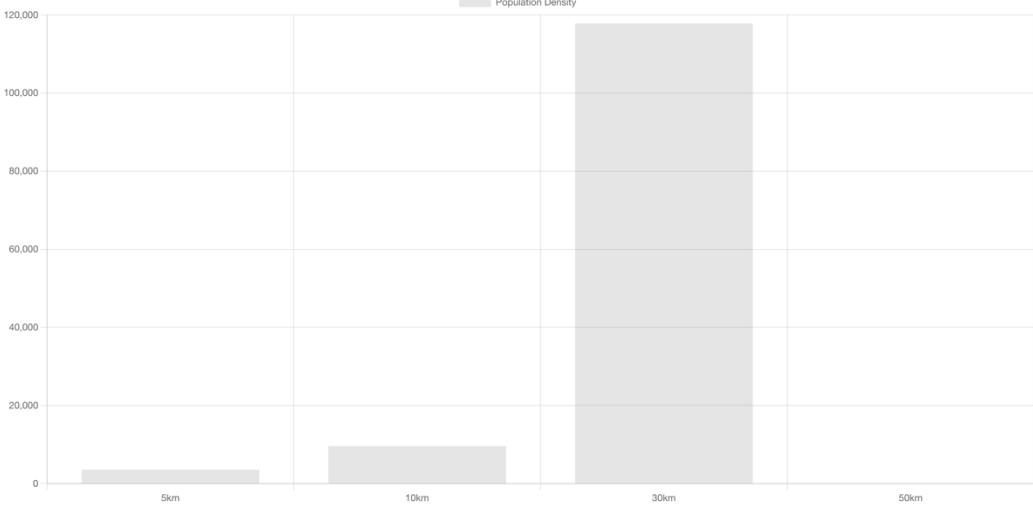
Home Volcano List Logout

Abu

Country: Japan
Region: Japan, Taiwan, Marianas
Subregion: Honshu
Last Eruption: 6850 BCE
Summit: 641 m
Elevation: 2103 ft



Pigeon | © OpenStreetMap contributors



Population Density

120,000
100,000
80,000
60,000
40,000
20,000
0

0 5km 10km 30km 50km

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[20]

[Home](#) [Volcano List](#) [Register](#) [Login](#)

Abu

Country: Japan

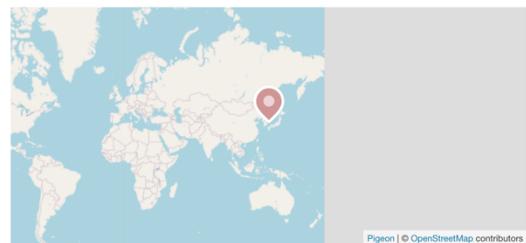
Region: Japan, Taiwan, Marianas

Subregion: Honshu

Last Eruption: 6850 BCE

Summit: 641 m

Elevation: 2103 ft



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