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SoftDev Pd 1/9

P04 -- Let the Data Speak

2020-04-28

Virographs DESIGN DOC

Description

Users will be able to compare trends of Coronavirus statistics between different countries and different US states. Users will also be able to see the effects of social distancing and quarantine on the spread of the virus.

Task Breakdown

Elizabeth: Project Manager

- Oversees project development
- Help with frontend/backend development
- Updates devlog, design doc, and READ_ME.md

Amanda:

- Create animated graphs using D3 and gathered data
- Javascript

Kiran:

- Create interactive COVID-19 simulation using svg/canvas
- Javascript

Lauren:

- Work on front-end CSS/Bootstrap to make website visually appealing
- Processes CSV and JSON files into usable format
- Python/Flask

Goal: To model infection rates of COVID-19 using D3 visualization and svg/canvas tools including:

- Line Graph
 - <https://observablehq.com/@d3/line-chart>
 - Shows the change in coronavirus cases over time
 - User can choose between total deaths/total cases/total recovered
 - User can choose which country/state they want to see
- Bubble Map
 - <https://observablehq.com/@d3/bubble-map>
 - Map of US states with bubbles showing new coronavirus cases
 - User can choose between new deaths/new cases/new recovered
 - User can click on states to see a summary of the stats
- World Map/Heat Map
 - <https://observablehq.com/@d3/world-choropleth>
 - Map of the world color-coded showing new coronavirus cases
 - User can choose between new deaths/new cases/new recovered
 - User can click on countries to see a summary of the stats
- Coronavirus Simulation Spread
 - Svg/canvas with turtles in a coronavirus simulator
 - Users can choose the initial number of cases, infection rate, social distancing factor, population obeying social distancing, delay of symptom display, quarantining of known cases, available hospital beds, among others.

Datasets/APIs

1. Global Confirmed/Deaths/Recoveries - JSON (Updates 3x/day) - <https://pomber.github.io/covid19/timeseries.json>
2. United States Cases/Deaths - CSV (Updates 1x/day) - <https://github.com/nytimes/covid-19-data>
3. Coronavirus COVID19 API (Updates 1x/day) - <https://api.covid19api.com/>
 - Shows today's cases by country/global count - <https://api.covid19api.com/summary>

Site Components

Frontend	Backend
Global Case Counter	API (#3)
Line Graph	JSON File (#1)
US Map	CSV File (#2)
World Map	JSON File (#1)
Simulation	<i>(remains client-side)</i>

Home Page

- **Global Cases Counter:** Each time the user loads our page, we will pull from [this](#) API and update the counter at the top of the page. Depending on how slow it makes our website, we could also have the counter update live and pull continuously from the API while the user is still on the page.
- **Line Graph:** The line graph will initially display a simple curve of active daily cases using data from the JSON file. The user will be able to choose if they want curves on the same graph representing daily closed/recovered cases and total infected. There will also be choices if they want to compare different countries.

Maps Page

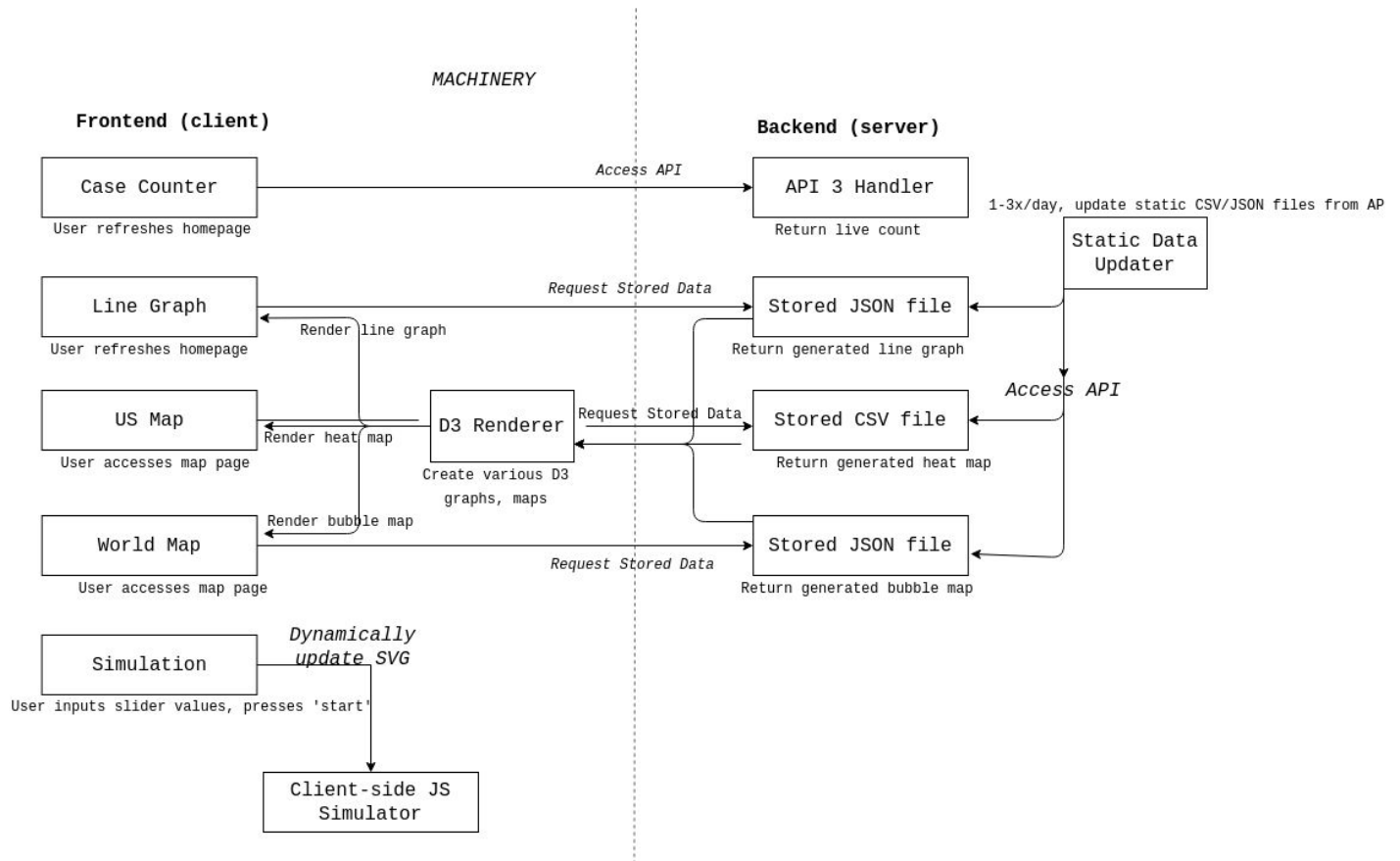
- **US Map:** The map will initially show a bubble map of the active daily cases using data from the CSV file. The user can choose if they want to see new deaths or newly recovered cases instead. The user will also be able to click on a state and see a summary of information about coronavirus cases in that state.
- **World Map:** The map will initially show a heat map of the active daily cases using data from the JSON file. The user can choose if they want to see new deaths or newly recovered cases instead. The user will also be able to click on a country and see a summary of information about coronavirus cases in that state.

Simulation Page

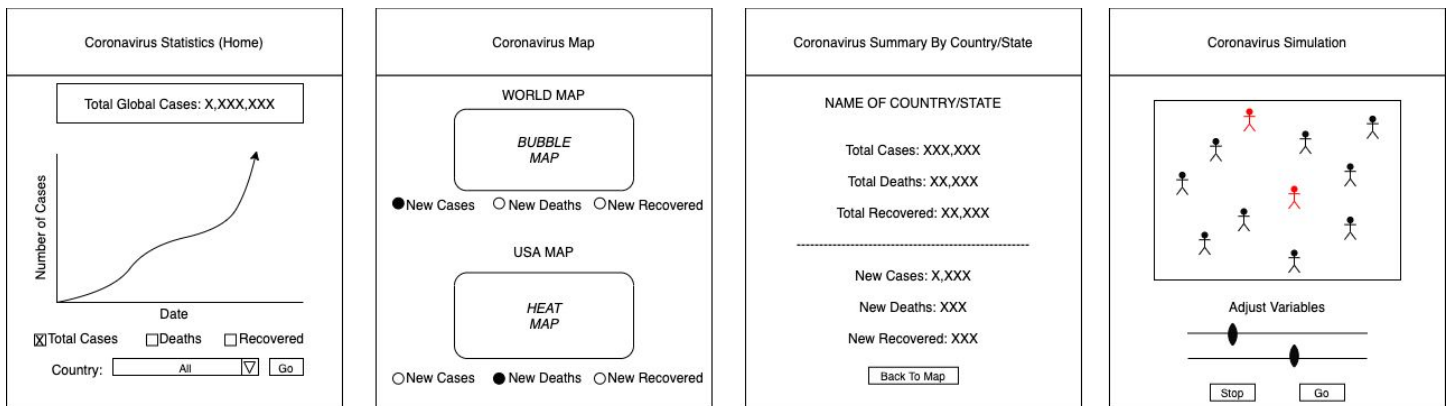
- **"Dot People" Simulation:** Dots within a SVG element will move around following instructions, whose behavior can be modified through adjacent sliders controlling factors such as motivation to self-isolate, etc. This simulation will run client-side, allowing a user to generate their own data and more easily visualize the spread of disease. Reminiscent of Netlogo models.

Components Map

(What are the individual components of your apparatus, and how do they work with one another?)



Site Map



home.html:

- Top of page shows global count, updated using (#2).
- Scroll down to find a line graph

map.html:

- Shows both an interactive world map and a map of the US

coronainfo.html:

- Displays a summary of the statistics in words for a country or a state

simulation.html:

- Contains svg box where simulations run
- Sliders to alter variables:
 - Infection Rate
 - Social Distancing Factor
 - Percent of Pop. Obeying Social Distancing Rules

Frontend Framework

Bootstrap is easy to use and has features we would like to utilize in order to create a website that is presented cleanly on any size window. Bootstrap also has lots of exciting components to try on our site including jumbotrons and spinners.

References

Simulating the epidemic - <https://youtu.be/gxAa02rsdIs>