Chicago Energy Usage

For our project, we obtained a dataset containing Chicago's highest energy usage totals from 2014 and designed an interactive map to display the information using JavaScript/D3. Our dataset was obtained from the City of Chicago's data portal and is organized by zip code (http://cs.uic.edu/~bshaver/zipcodes.csv). The problem with the data by itself is that it is not very interesting or useful in a spreadsheet, so the goal of our project was to visualize the data by creating an interactive map of the city of Chicago to display it more eloquently to the viewer.

One of our sources of inspiration for this project was a map visualizing the number of independent farms in the US by county (http://isda.ncsa.illinois.edu/~mpsimeon/projects/maps/www/farms.html). The layout of this map is what we had in mind when designing our map of Chicago. The counties on the map are individually colored based on values from the dataset, and as the user scrolls over the map the data for each county is displayed in a tooltip box. Those are the key features we wanted to include in our map.

Due to time constraints, our map is complete except for one key part. We were able to design an interactive map that included the data, but the map is not color-coded. However, it still helps visualize our dataset because the viewer can see the correlation between the data for each zip code and the size of that area. For example, the map shows very small areas of downtown Chicago using an astronomical amount of gas and electricity compared to much larger areas of the city that used much less. Our dataset only contains information for 41 of the 61 zip codes of Chicago since it is not an exhaustive list for the entire city, so each area that has data attributed to it can be displayed by hovering the mouse over it, and for areas that were not included in our dataset a tooltip box informs the user that there is no relevant data available for that zip code when hovered over.

For the project, I (Brandon) was responsible for creating a fully-functional interactive map of Chicago that displayed the city's zip codes when scrolling over each area. I started by finding a plain map of Chicago's zip codes and building it into a topoJSON file that had all 61 zip codes embedded into it as a list of properties. Then using JavaScript and D3, I was able to adjust the map's size, give its areas and borders a default color, enable the user to zoom in and pan around the map, and highlight each area and display a tooltip box containing its zip code when hovered over. This version of the map was the template for our project because it functioned the way we had envisioned and only needed to be embedded with the information from our energy usage dataset to be complete. I (Brandon) was also responsible for writing all this documentation for the project.

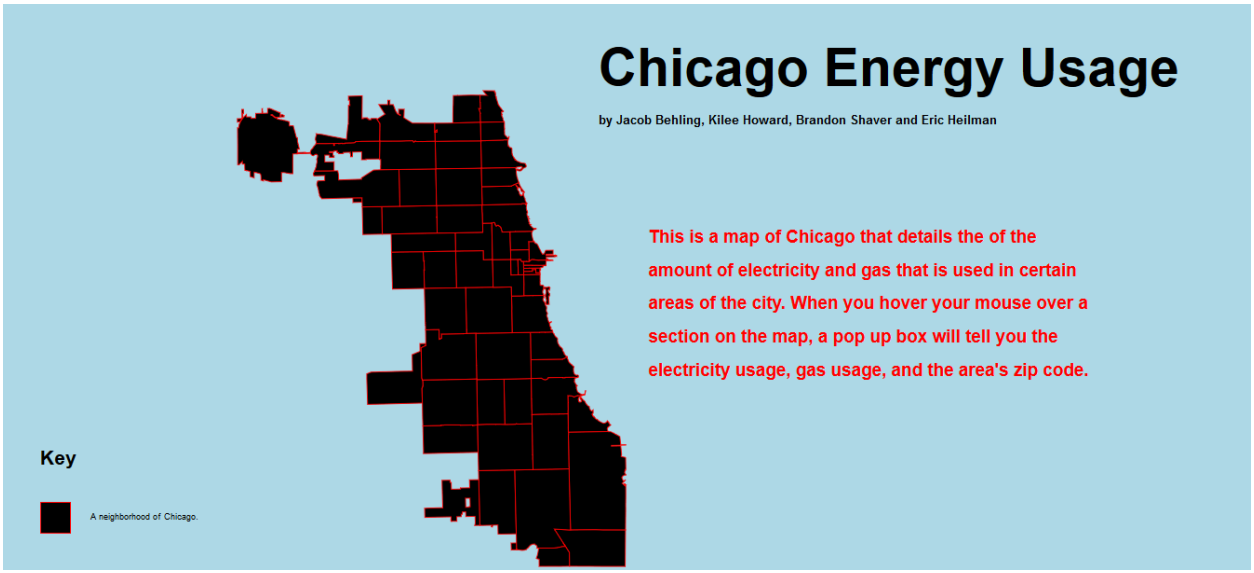
Eric was in charge of adding the data from our dataset into my interactive map. Specifically, he wrote the code that imported the data file into the project and stored it into an array (chicago_zips_topojson.html, lines 67 – 71, 129 – 135), and wrote the code that displayed the properly-formatted information in our tooltip box (lines 107 – 114, 138 – 144). He also wrote the project abstract for our initial presentation.

The designers on our team, Kile and Jacob, were responsible for finding our dataset, creating the Powerpoint slides we presented which contained information about the dataset, Eric's abstract, and the sketches drawn by me (Brandon), Kile and Jacob. Kile and Jacob's main task was to design how the final project should look and function so that the Computer Scientists

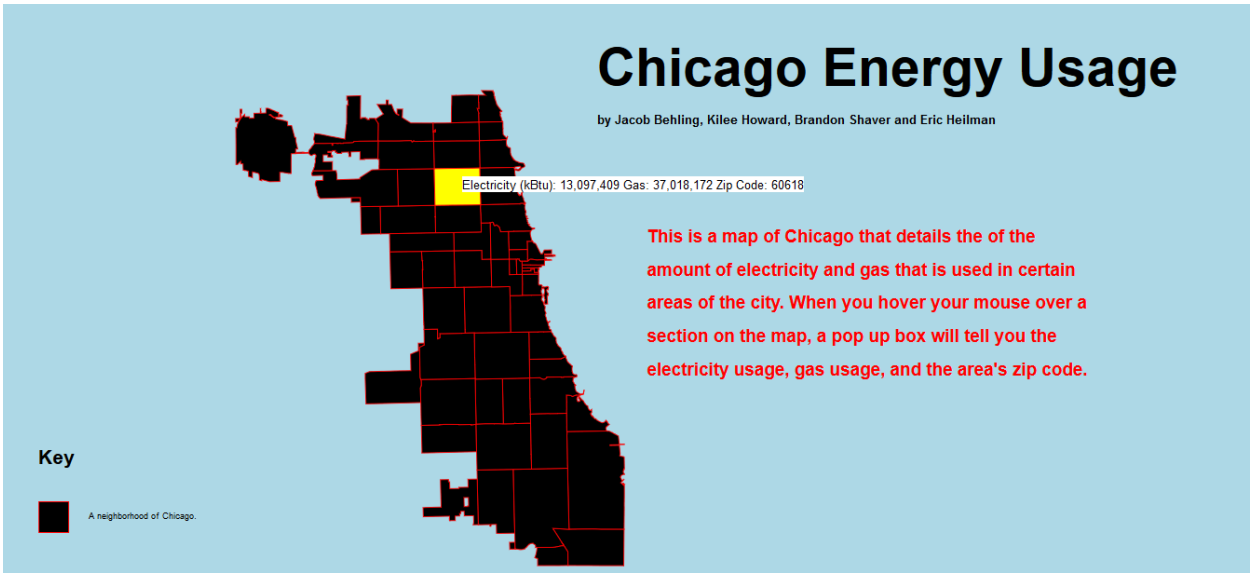
could create it through coding in JavaScript/D3. Jacob also went back at the end of the project and added all the relevant information to the webpage including project title, team member names, project description, and the map key.

Link to GitHub: https://github.com/brandon10092/Chicago-Energy-Usage

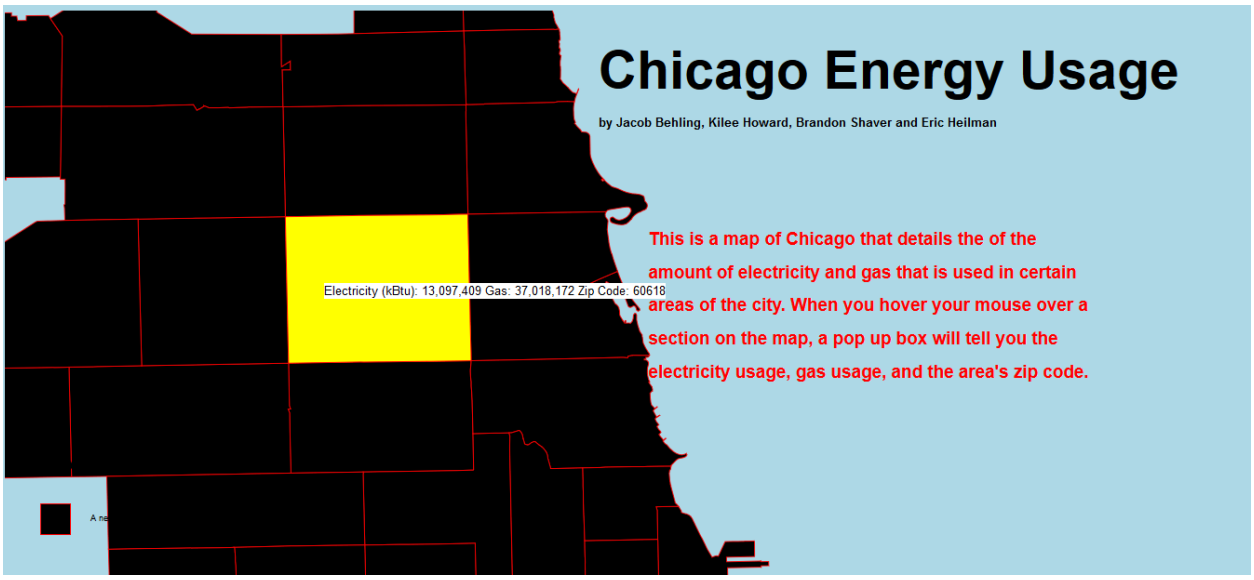
Images of the project:



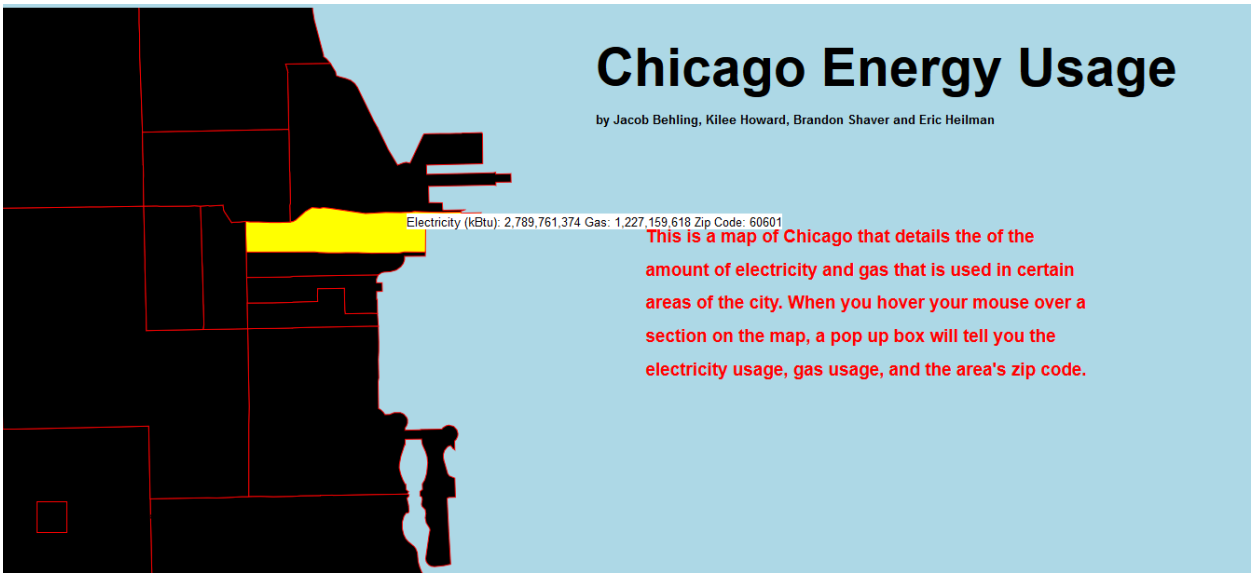
What the opening page of the project looks like



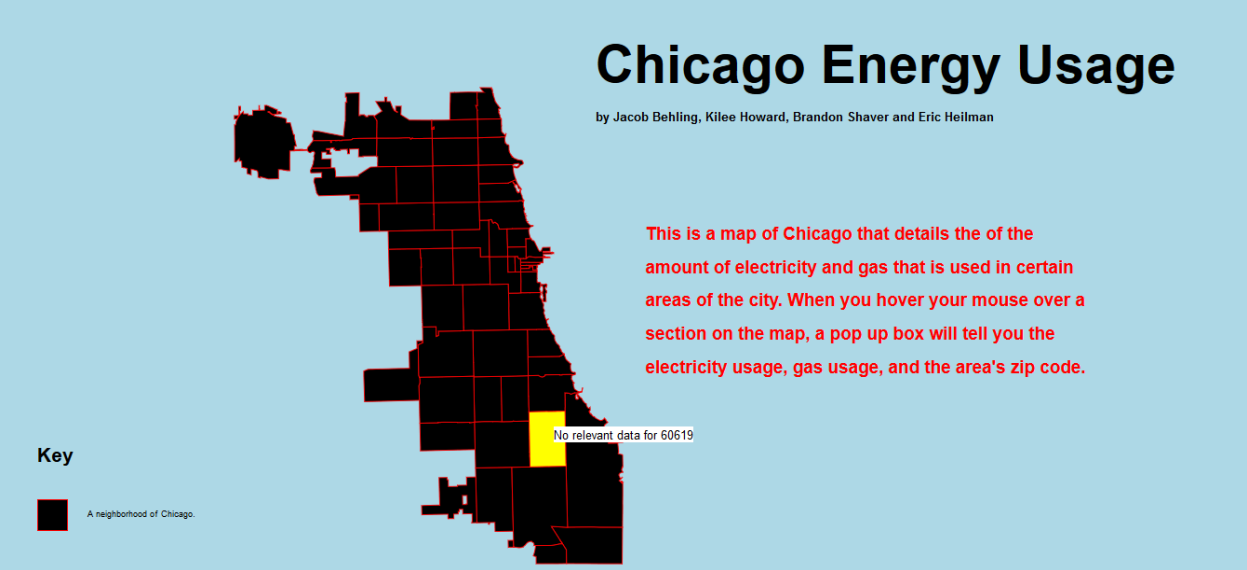
An example of the map displaying energy usage data for zip code 60618



Showing the same area of the map using the zoom feature



Showing the incredible energy usage totals in Chicago's Loop/Millenium Park area



An example showing an area of the city for which no relevant data was provided in the dataset