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Project 3: Documentation

1. **Functionality**

* The MapBox API was utilized in this program to serve two purposes. First, is to display a navigable map of the United States to the user. Second, is to find the latitude and longitude coordinates of the various regions, states, and counties to create accurately located markers to host the area’s data.
* The US Census API was utilized in this program to find the total number of households and the presence of various Internet subscriptions within these households in the selected region, state, or county levels.
* This web service has six facets to narrow the search of the user. They can select which type of Internet presence, a starting year, an ending year, a desired region, a desired state, and desired county. When a data type is first selected, the region drop- down will be populated with available regions. When a region is selected, the state drop-down will be populated with available states within the selected region. Finally, when a state is selected, the county drop-down will be populated with available counties within the selected state. If a search occurs with area levels unfulfilled, markers will be created for all available selections one level lower. For example, if the Northeast Region is selected markers will be made for all states within the Northeast Region.
* Upon searching, all parameters used are saved to local storage and upon refreshing of the web page are reentered and searched for. These parameters can be changed by either altering the parameters and searching again or resetting.

1. **Design & Interaction**

* All controls are simply designed and labeled allowing for quick understanding.
* When moving through the subdivisions of selected areas, only the available areas within the current selection are displayed to limit confusion.
* Subdivisions of area are only permitted when the higher divisions have been fulfilled to allow for a more streamlined list of available searches.
* Marker data is cleanly divided to be shown by year for increased readability.
* If a search is ever attempted to be performed before selecting a data type (as it is the only user selection required to produce a minimal search) an alert will be sent to the user requesting for them to select a data type first.
* At the base of the controls a loading symbol and message will be displayed to alert the user to what is currently being processed.

1. **HTML/CSS/Media**

* All HTML and CSS validates.
* The web service utilizes the semantic elements header, section, and footer to divide the visible elements.
* The used marker and GIF are both smaller than 50kb.
* The web service utilizes an embedded Google font: Merriweather Sans.

1. **Code**

* An ES6 class is utilized to create the markers seen on the map.
* Typical coding conventions are followed throughout the program.
* No errors are displayed within the console at any stage of the processing.

1. **Impact**

* The application retrieves and utilizes the provided API data to not only display the unaltered data but makes comparisons between and divides it based on which data selection is relevant.

1. **Right**

* The levels of searching where only the relevant state and counties are visible.
* The requests for four different data sets from the API to find the total households within the selected data type and total households overall for both the selected start and end year to allow for a more effective review of the desired data.

1. **Wrong**

* There are a large number of requests to both the US Census and MapBox API, four from the US Census for data collection and comparison, along with a call to MapBox for each of the latitude and longitude of each areas within the selected level. This has resulted in me inputting in manual delays throughout the code to make sure the desired data is correctly pulled and sorted before processes continue.
* Unfortunately, when searching the MapBox API for the various desired locations, regions did not exist and had to be hard coded in. Along with this, many counties with same names existed within multiple states so upon searching it would on occasion return locations outside of the desired state despite including the state name within the search.
* The US Census API did not store the corresponding region for a given state, resulting in hard coding being required to separate which states are in which regions.
* Within the US Census API regions, and states were not stored in alphabetical order and their order number ranged from 1-72 with many gaps resulting in additional hardcoding for accurate presentation of data.
* In the US Census API, the data collection altered following the year 2015. This resulted in many additional calls to the API being necessary to accumulate the desired data changes across the years.

1. **Future Features**

* Allow for the selection of multiple data types, or specific areas and create comparisons between them.

1. **Resources**

* MapBox API
  + <https://account.mapbox.com/>
* US Census: Presence and Types of Internet Subscriptions in Household API
  + <https://data.census.gov/cedsci/table?q=B28&d=ACS%201-Year%20Estimates%20Detailed%20Tables&tid=ACSDT1Y2019.B28002>
* Loading Gif
  + <http://superstorefinder.net/support/knowledgebase/customizing-loading-icons/>
* Marker Icon
  + <https://simpleicon.com/wp-content/uploads/map-marker-8.png>

1. **Overall Grade**

* 95%
* This application goes well beyond what was originally displayed in class by combining the MapBox and US Census API into a service that can be used to display a wide variety of data detailing the presence of various Internet types across regions, states, and counties. When moving through the levels of subdivisions only the associated data is shown. In addition, start and end years can be selected and will show the number of households with the specified Internet type, the percent of the given population this number encompasses and the percent gain or loss in the use of the desired Internet type across the selected time period. However due to the amount of comparisons being made there are a large number of calls to the two APIs resulting in a significant amount of time being required (10 seconds) to guarantee the accurate completion of each search request.