

### Initial Project Design: Find My 14er

**Project Type:** Storytelling Project

**Design:** The following is a task abstraction using the framework described in Munzner Chapter 3. The table includes the task abstraction, actions, targets, and finally describes the domain specific task.

Task Abstraction	Actions	Targets	Domain Specific Task
<u>Compare</u> values between different targets	Query → Compare	Attributes → Many Attributes → Similarity	The user will have the ability to compare characteristics of different targets (peaks) such as elevation gain, current weather, foot traffic, difficulty, or distance.
<u>Locate</u> values using known targets	Search → Locate	Attributes → Many Attributes	The user will have the ability to locate peaks using certain desired characteristics (targets) such as specific mountain range, difficulty, distance, popularity, or elevation gain.
<u>Lookup</u> known target and <u>Identify</u> values for that target	Search → Lookup Query → Identify	Attributes → One Attribute	The user will have the ability to first lookup a known target (peak) then identify the current weather for that known target and view standard route for the target.
<u>Summarize</u> all targets	Query → Summarize	All Data	The user will have the ability to obtain an overview of 14ers in Colorado, color coded by mountain range, as a graphical display map.

## Design choice: Geographic Map.

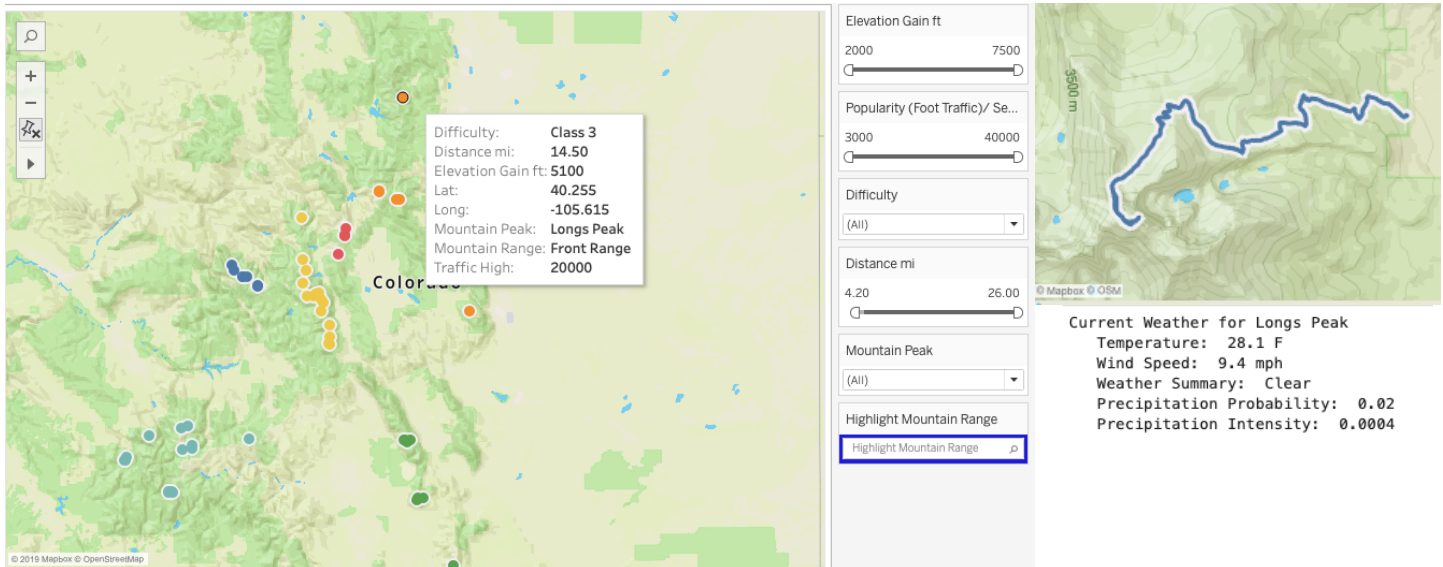


Figure 1. Main geographic display map idiom

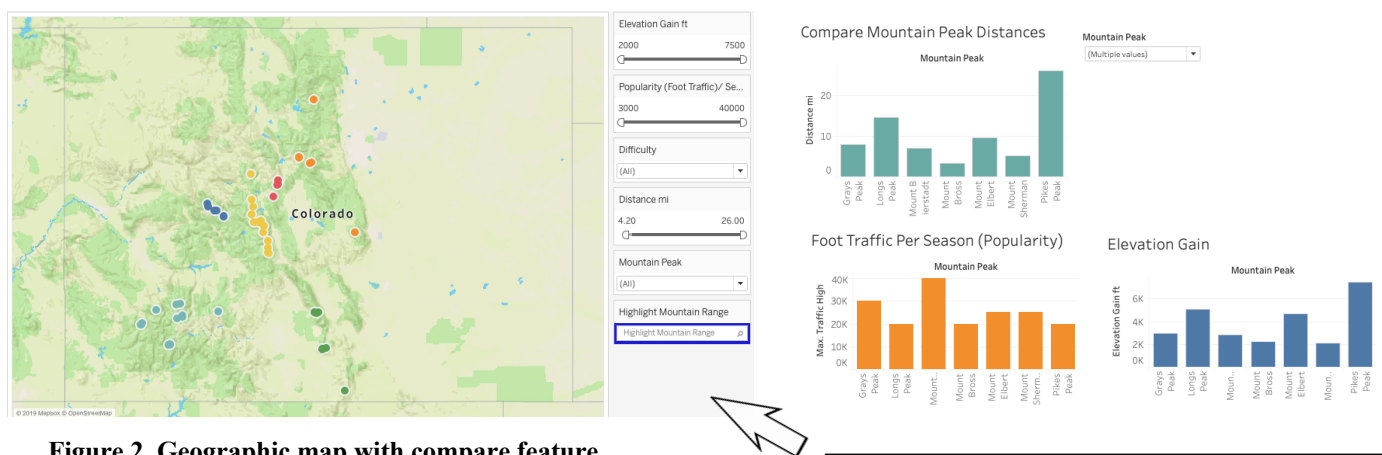
The geographic map idiom will be designed using Tableau, and will be the main visualization idiom used in the project. This idiom will support multiple tasks outlined in the task abstraction, including summarizing all targets and locating values using known targets. Interactions between other idioms will be established to further incorporate all tasks outlined in the task abstraction.

The geographic map idiom will support the task of summarizing all targets by providing a general overview of all 14ers in the state of Colorado in a graphical display map. The idiom uses color marks to differentiate between mountain ranges, and supports the ability to highlight specific mountain ranges and also provide more information about a target (mountain peak) by clicking on a mark within the idiom. In the above example, Longs Peak has been clicked on and further information about the peak can be visualized including (but not limited to- more to come!) difficulty, distance, elevation gain, latitude, longitude, the name of the peak, the mountain range the peak is within, and the amount of foot traffic estimated during the 2017 climbing season. The idiom will further include a link to a picture of the particular peak.

The geographic map idiom will also support the task of lookup for known targets and identifying values for that target. In the above idiom, Longs Peak was selected as the known target. The standard route (Keyhole Route) is then displayed in an additional view, using a contour map with the route highlighted. The current weather will also be integrated in an additional view, using a visual representation more

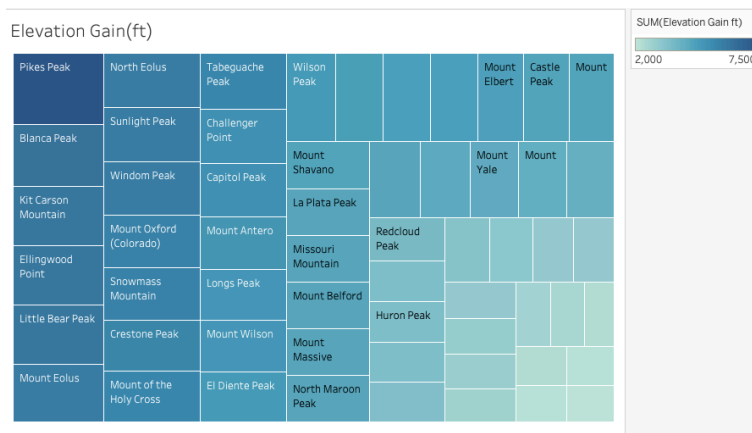
visually appealing than what is currently displayed. As the user clicks on different mountain peaks, the standard route and current weather will be displayed for that particular peak, similar to what is shown above for Longs Peak.

Locating values using known targets will also be supported within the main geographic map idiom. As noted in Figure 1, a user can use the dropdown menu to select a known target (peak), or adjust characteristics such as highlighting a specific mountain range, selecting a specific difficulty level from a dropdown menu, or filtering the distance, elevation gain, or popularity of a specific peak using the sliding scale options shown in Figure 1.



For the task of comparing values between targets, an example of an idiom to be used can be seen in Figure 2. Bar graphs are a great idiom to compare values between different targets. This idiom would be displayed on the same page as the graphical map, but arranged as either a pop-out display window, or arranged

A compare option will be here, which will allow users to select which attributes they would like to compare, and the output display will be shown as above. For the above example, the user is comparing distance, foot traffic, and elevation gain for the same specific mountain peaks. Peaks are selected through a dropdown menu with checkbox options for each peak to include in the comparison.



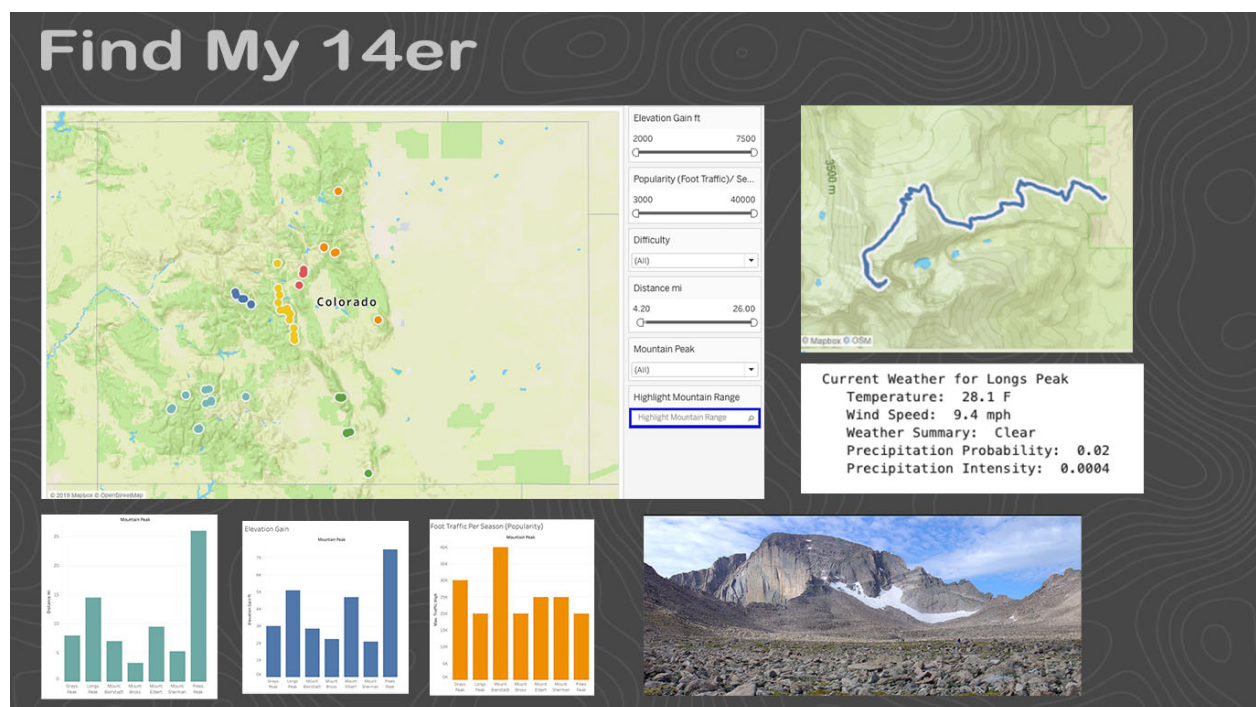
as a feature on the same page as the geographical map.

Other idiom options for comparing values between targets include a Treemap, which is shown in Figure 3 for comparing elevation gain between mountain peaks.

If the Treemap idiom option were to be used in my visualization design, I would incorporate it with similar placement as the bar graph idiom shown in Figure 2.

I likely will not include the Treemap as I find it less effective at conducting quick comparisons. It is difficult to distinguish between the shades of blue, and would likely be a better choice when comparing values within a larger range. It appears when comparing elevation gains of the 14ers within Colorado, the range is from 2000 to 7500 ft, with many appearing to be within the median range of around 5000. I think a bar graph comparison would be a better choice for this particular comparison.

Ultimately, my design plan will likely be implemented as a webpage, integrating multiple idioms. I would choose to conduct my project this way in order to incorporate external features, such as current and projected weather. To do this, I will likely use a widget such as from DarkSky API, and incorporate it into the webpage. A general idea of how I would like the design of my project to be displayed is shown below.



The geographic map will support the tasks of locating values using known targets, lookup a known target and identify values for that target, compare values between different targets, and summarize all targets. Scalability will be addressed through interactive techniques, and the user will be given many options to customize the desired targets and conduct comparisons. The views will change as the user selects desired targets or comparisons, and when hovering over a specific mountain peak the user will have an option to click on the peak where the information will be updated (the current display is for Longs Peak, minus the

comparisons). For scalability, the user can interactively zoom within the geographic map, hopefully incorporating a Birds Eye Map to put the current selection into perspective with the map as a whole.

**Infrastructure:** Tableau will be the main choice of tool used to create this visualization. Figure 1, Figure 2, and Figure 3 were all designed using the Tableau system. I will also be integrating a weather feature, which will likely be an embedded widget from a source such as DarkSky API. The photos for each mountain peak are contained within the original dataset, obtained from 14ers.com. I will need to import the standard route file for each peak in order to incorporate elevation profile comparisons and mapping of the standard route within the contained view. These files are already converted to csv, but will need to be imported into Tableau to be integrated into the visualization.