

Assignment 2

Visualization

Visit the link below to get access to my workbook on my Tableau Public server:

https://public.tableau.com/views/Assignment2Earthquake/Sheet1?:language=en&:display_count=y&publish=yes&:origin=viz_share_link

User Tasks

The user tasks that my visualization provides will be discussed in terms of “*Shneiderman’s list of visualization user tasks*”. In his list, there are seven main tasks that a user can perform on a visualization. These include: *Overview, Zoom, Filter, Details-on-demand, Relate, History, Extract*. Each of these tasks is essential for a user to efficiently and conveniently explore and understand a visualization. For my visualization, all of the tasks in the list are offered except for *Relate* and *Extract*. The available tasks will be discussed in detail below:

- **Overview**

By the definition of Shneiderman, *Overview* is the task where users can gain an overview of the entire collection. In other words, the visualization has to be able to showcase the data in a general space and/or time reference frame. To be specific, in my visualization, at the first look, the users will see how earthquake incidents distributed across the geographical map of the world. Additionally, supposed the users have not paid attention to the legend of the color scale, they can still figure out the difference in the *strength* or *seriousness* of the earthquakes as the result of the effect of the colors. Clusters will also be visible to the viewers. However, without any further exploration, users are still unable to make out the occurrence time, the

exact locations, the magnitude of each earthquakes, and the indication of the color scale and data points' sizes.

Looking to the side of the visualization, there are two legends that describe the indication of sizes and colors. In this case, bigger circles and darker, or redder, colors indicate the earthquakes have a higher magnitude or higher *strength*. This way, the users can extract a lot of useful information just from an overview of the graph without performing any further actions.

- **Zoom**

To zoom in on items of interest is the second task that my visualization allows users to do. There are a few ways to perform this task such as clicking on the buttons on the worksheet, using touchpads on laptops, or finger-gesturing on smartphones and tablets. The zooming effect will enlarge the map which results in a more accurate demonstration of the distance between locations where earthquakes occurred. This *Zoom* task will allow users to explore the clusters on the map where multiple data points overlapping each other. The opposite action to zoom in is to zoom out, and users are also capable of doing that on my visualization. Zooming out helps gaining an overview of a specific location on the map which has the same effect as the first user task discussed above.

- **Filter**

On the right side of the worksheet, standing above the two indications discussed in the *Overview* part are the two filters for the map. The first filter is called "*Time (hour) of the day*" with a slider bar that allows users to filter out the earthquakes that occurred in a specific range of time in a day. Note that this dataset contains the earthquakes that happened in a single day of a single year, so it is reasonable to create a filter that takes hours of the day as the unit of time. For example, users can slide the pointers to 2pm and 4pm for the map to display only the events that took place in this frame of time. \

The second filter has the function but instead of time filtering, *“Range of Magnitude”* filters data points based on the *strength* of the earthquakes. With a similar action, users will utilize the pointers on the bar to choose a starting and an ending point of magnitude. As the result, only events fall into that range of magnitude will be displayed on the map.

- **Details-on-demand**

Users can select a data point on the map to explicitly read the information related to it. For example, user can randomly hover over an earthquake around the India area, and the details including latitude, longitude, occurrence time, exact location, and exact magnitude will show up. In addition to just “hover over” a data point, a user can also click on it to explicitly make that data point pop up on the map while the rest of the data will fade into the background. This user task provides the information about the exact time and location which cannot be obtained from *Overview* and *Filter*.

- **History**

Tableau worksheets support undo and redo actions. A user can also use the “Reset” button to clear the history and start all over again from the original view of the visualization.

Additional Graphs Proposal

To further inform the users of the features and characteristics of the dataset, I believe additional graphs are necessary.

The first graph that should be included is a **Gantt Chart**, or **Histogram** that illustrate the distribution of the magnitude. As my main visualization is heavily based on the magnitudes which can be seen in the process of toggling the color scales and sizes of the circles. The major population of the earthquakes in this dataset happen to have a magnitude ranging from 6.00 to around 8-9.00 with only a few outliers at 13-14.00. It is hard to make out this distribution with only the geographical visualization. It is recognizable

that “small” earthquakes with a yellow-ish color take over most off the map, but to exactly tell what range of magnitude they fall into is rather a very challenging task.

The second graph in the proposal is a **Bar Chart** or **Packed Bubbles** or any type of graphs that can illustrate the number of earthquakes occurred in different countries or continents. This visualization will put the users in a different point of view: it will illustrate a country-wise distribution of earthquakes. This piece of information cannot be acquired from the geographical map. Even though this kind of visualization cannot replace the main symbol map, it surely will add some quick and useful insights to the users experience.