Channeling Hans Rosling Assignment **Vipul(18200328), Pooja(18200167), Aquif(18200043)**

In this visualization, GDP vs Global Competitive Index is plotted in bubble chart and size of the bubbles are represented by Population field of a country (countries are grouped by the "Forum classification" field in the data), this whole idea is represented year-wise via animation and can be seen by selecting a particular year using year dropdown control.

Functionalities:

Year-wise change for particular country and animation over years

- GDP vs Global Competitive Index can be compared for two different countries for year 2007-2018.
- We can check particular countries position by on mouseover, see it's change across different years and particular year.
- Countries are grouped based on "Forum Classification" and each group is given distinct colors.

Handling missing data using Interpolation

- Data interpolated to avoid missing values using python script and the interpolated data is distinguished from original data by giving a decreasing transition of stroke-width.

Play and Pause animation

- Animation is continuous/repeated and can be played/paused and both graphs are in sync.

Trace

- We can check trace of particular country over the years by selecting "Show Trace" and then selecting the particular country.
- Trace can be removed by clicking on svg of 1st visualization, unchecking "Show Trace" or if a particular year's data is selected from year's dropdown.
- On changing the country, trace of previous country disappears and charts adapt too.
- On selecting Show Trace, we can see the multi-variate visualization which is an animated bar chart which compares competitive indices across the years and the animation is in sync with 1st visualization.

Compare two countries – Trace and Multivariate data

- Compare functionality allows comparison of two countries across 12 competitive pillars (Multivariate Visualization) and trace of those countries.
- The second country can be changed to modify the comparison and the labels, axis everything adapts accordingly.
- Checks performed to see if country is selected or no and if country1 and country2 are same then the user is notified accordingly.
- Compare option won't work until "Show Trace" is selected because we will be comparing trace and multivariate visualization.
- To return to normal bubble chart animation hover on the countries.

Details of interpolation:

Missing values in the given data handled using interpolation technique. For that a python script is written to handle missing values by interpolation. (Interpolation.py file attached). New spreadsheet (GCI_Updated) generated by running this python script is now used to create the visualization. (NOTE: First run the python script and then run the visualization file.)

Details of Multi-variate design:

The visualization is implemented by filtering the dataset to get 12 indices data for particular year and country. The scale of the graph is determined based on maximum value from all indices and horizontal bar graph is displayed as the labels are large. The axis, labels and title of chart changes based on number of selected countries. We can compare 12 indices for two countries at the same time. 12 variables are represented by each bar in the chart and for each country a particular color is assigned to make it easily distinguishable. Control of compare option is provided in the visualization to show values of 12 pillars for one or two countries to compare on year to year basis via animation.