Milestone 2

Sketches

Sketches for each visualization as well as a sketch for the whole website which shows layout of visualizations are made by hand using a tablet. All the sketches are available in the appendix.

Tools and related lectures

For the website architecture, we use React in conjunction with D3.js. In all visualizations, we are relating to the lectures Basic web development, Javascript part 1, More Javascript, Do and dont in viz, Designing viz and Storytelling. The tools and related lectures we need for each visualization are the following:

Visualization	Tools	Related lectures
LeaderBoard - top 10 countries	d3, d3-color, react-spring	Perception colors, “Mark, channels”, Interactions, D3.js
World map over years	d3, d3-color, d3-geo, topojson	Perception colors, Maps, Practical maps, D3.js, Interactions, More interactive D3.js
Scatter plots for correlation	d3	D3.js, “Mark, channels”, Tabular data
Network graph of neighbors	d3, d3-force	D3.js, Graphs
Parallel coordinates visualisation	d3, d3-color, d3-brush	D3.js, Interactions, More interactive D3.js, Perception colors, Tabular data

Project Goal

Our main goal for this project is to produce high quality interactive visualizations that allow the user to get a deeper understanding of the differences that contribute to a country’s happiness score as well as explore happiness scores and trends over the last 9 years all over the world.
For this purpose, we have thought of the following visualizations:

- A dynamic leaderboard that displays the top 10 ranking of countries based on happiness score, which allows one to see at the same time the difference between the different countries. The visualization can change according to the year selected, or play through all the available years by itself.
- A dynamic and interactive world map that also allows one to play through the years of data, with each country being colored based on a gradient corresponding to the happiness score.
- An assortment of scatter plots showing the correlation between two variables at a time with each dot representing a country.
- An undirected network graph that represents countries via its nodes, and a border between two countries via a link between two nodes. The size of the node represents a variable score, and the length or width of a link represents the absolute difference between two neighboring countries. We also want to experiment with the position of the nodes, whether by fixing them, restraining them through a force network or another form of positioning.
- A parallel coordinates visualization representing the value of each variable on the x-axis, and each country on the y-axis. Each country is represented as a line that intersects each of the parallel lines, and the value of each variable for a given country is shown by the position of the

line on the corresponding parallel line. This allows for easy comparison of the values of the variables across the different countries.

Extra Ideas

- Explore facts about Finland which has ranked first in the last 6 years, present interesting data facts, statistics or graphs in the end of a webpage under the title “Is there a key to happiness?”
- For the scatter plots, one or even two dimensions can be added through circle size and color to represent more variables (e.g. GDP on x-axis, life expectancy on y-axis and happiness as circle size.)
- For the parallel coordinates, on hover over the axis, link colors of the lines to that variable
- For the parallel coordinates, show selected country names by side (ranked by happiness)

Roadmap

First, we divide our goal into several main steps:

- Exporting data for visualizations
- Designing visualizations, the website and the story we want to tell
- Implementing separate visualizations
- Laying out the visualizations and storytelling
- Hosting the website

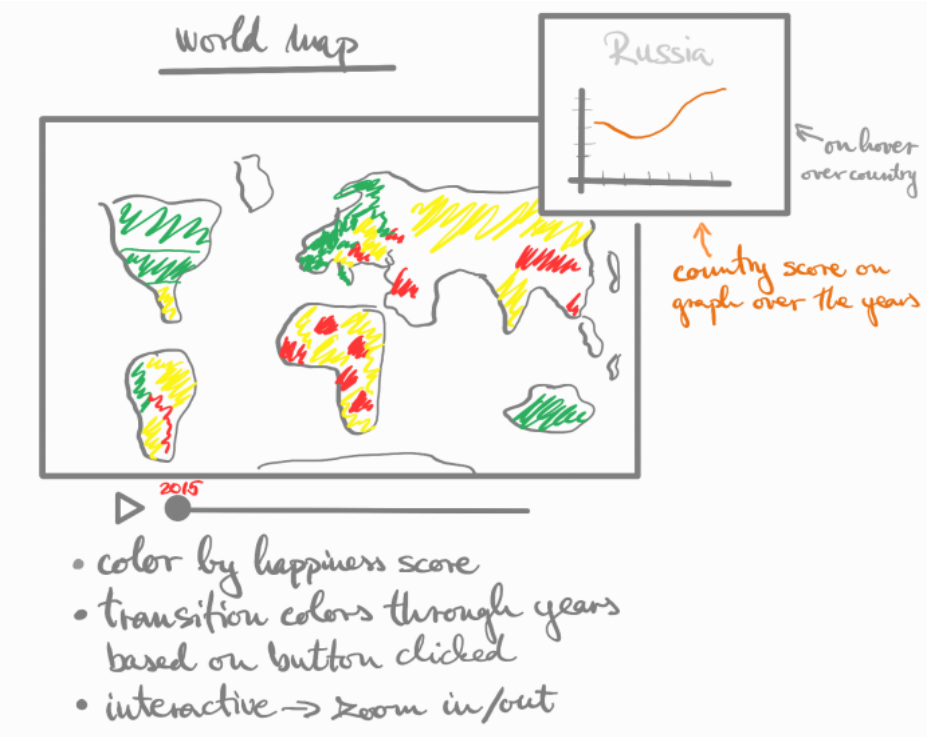
Moreover, we divide implementations of each visualizations into separate steps as following:

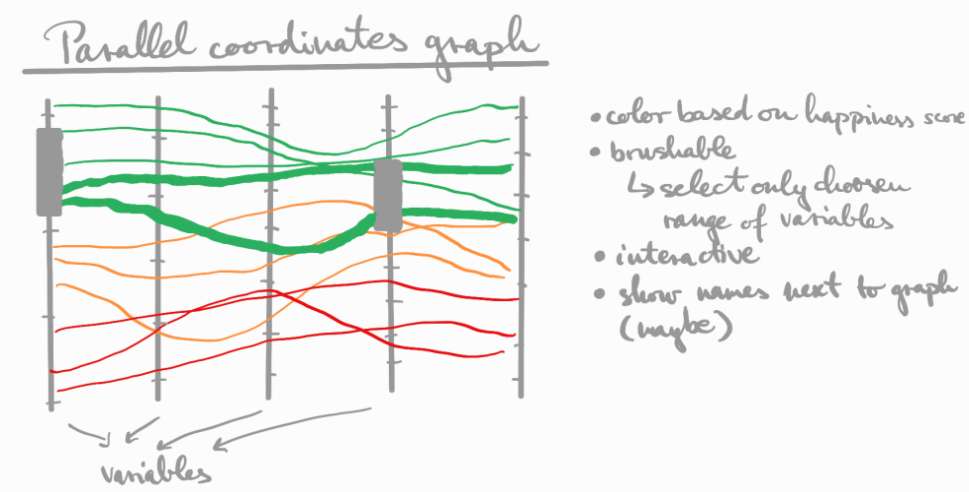
- Leaderboard: Map top 10 countries to leaderboard, change colors and widths based on score, make visualization interactive using progress bar
- World map: Download a TopoJSON world map, create the map with d3.js, link the colors to happiness score, make interactive using progress bar, add information on hover
- Scatter plots: Visualize scatter plot for different variables, add interactive buttons to change variable, add description of variables, add information on hover
- Network graph: Create a simple interactive force graph from JSON file containing countries information, add information on hover of nodes, add a dropdown menu to choose what variable is represented by node size, add some eye-candy (smoother animations, etc…)
- Parallel coordinates: Create the visualization from data, link the line color to happiness score, make the visualization brushable

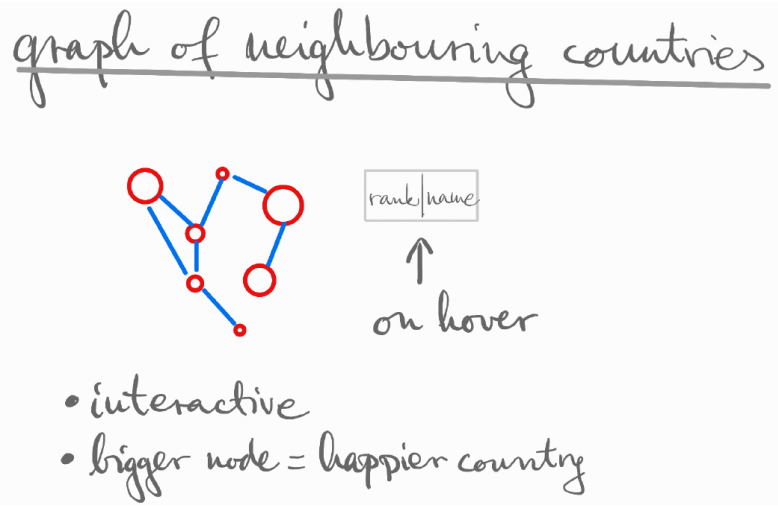
Prototype

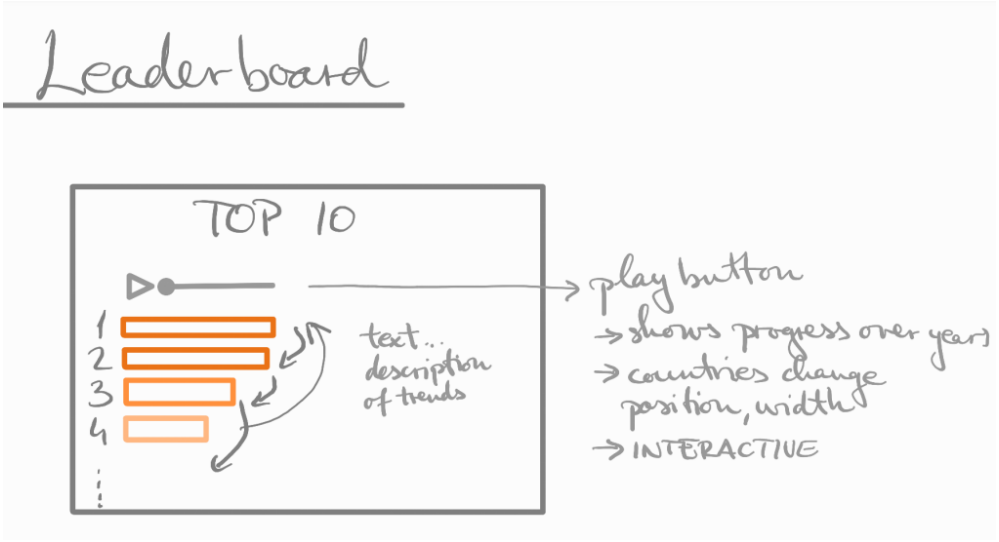
Website for Milestone 2 is available online.
If you wish to run the newest version of the website yourself, you’ll need nodeJS and npm.
In the “website” folder of the “master” branch, run the “npm install” command, followed by the “npm run dev” command. The website will then be available at the address specified by npm.

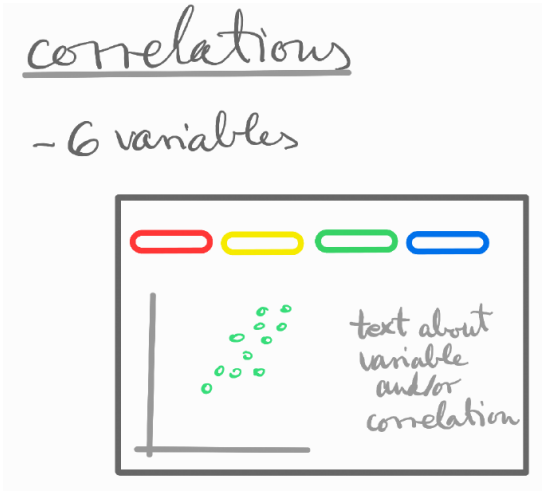
Appendix - Sketches











Sketch for whole website layout: