Milestone 2 - World Food Balance *by DataGang Group*

Rationale

Our Food Balance Sheet dataset contains four important features: 1) the quantity of food supplied as well as consumed by either people (noted as "*food*") or livestock (noted as "*feed*"); 2) The aforementioned quantity of food specified by different food types; 3) The aforementioned quantity of food by different countries and 4) across different years.

In light of this, two questions arise naturally: 1) How much food is consumed by people or by livestock? 2) What are the dominant types of food in each case? We would like to visualize the dataset in accordance with the two questions, both country-wisely and time-wisely.

Visualizations

A preview of the website can be found here. The source code can be found under folder `./src/`.

The core visualization for our project will be a world map (See Fig.1). The idea is to color each country by a chosen preset. Depending on how far we progress, the variety of presets could differ, but the two main things that we would like to visualize are the food vs feed supply and the overall global food supply. So, for example, if the user were to select global food supply, the countries on the map would be colored according to their food supply per capita. This will allow for a clear comparison of food availability among all countries. The other primary issue we want to visualize is the allotment of food for human consumption versus for feeding livestock. For this visualization, we can color the countries according to the proportion of food they allocate for human consumption and then by the proportion of food they allocate for livestock.

In order to view the evolution of global trends over time, there will be a timeline along the bottom of the map. In addition to looking at global trends, when a particular country is clicked on, a pop-up will appear with more precise information specific to that country.

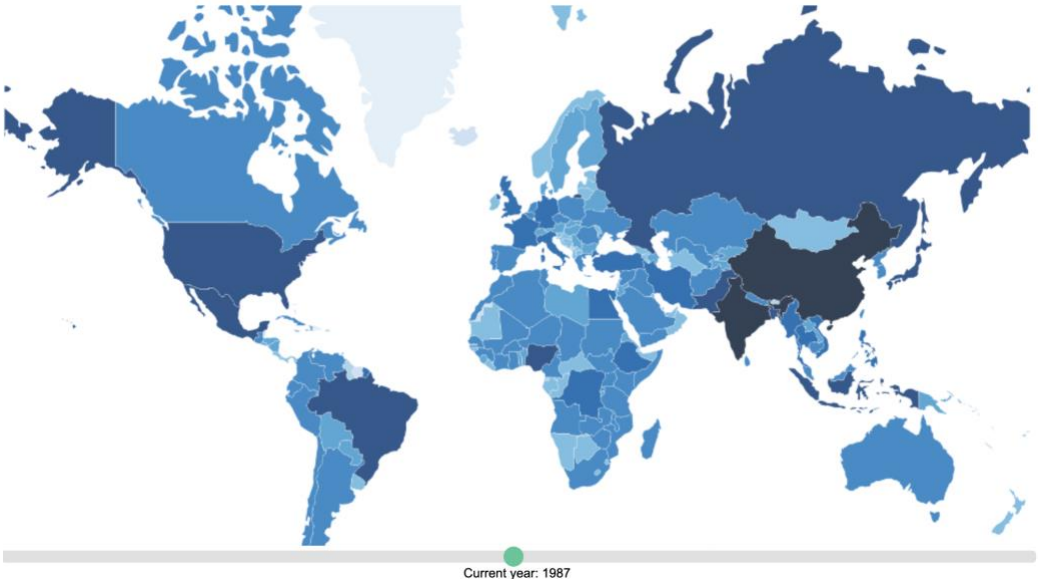

Fig 1. The core visualization of a world map that shows food / feed supply (under different criterions, controlled by an option box) across one certain calendar year (controlled by a timeline slider)

To the right of the main map, we will include two complementary visualizations. These visualizations will also adjust according to the same timeline used for the main map. In order to convey the information in a straightforward manner, we will just look at continental trends for the first one. The idea is to show what percentage of the population in a continent could be fed by that continent's food supply. For example, we will take the population of a continent and the yearly food necessity for a person and calculate how much food is needed to sufficiently feed the population for a year. Then, we will compare that number with the food supply of a continent for a given year, using the aggregated data for that continent. We will visualize this difference by representing each continent by icons of people and coloring them according to the percentage of the population that could be fed with the yearly food supply. (See Fig. 2.)

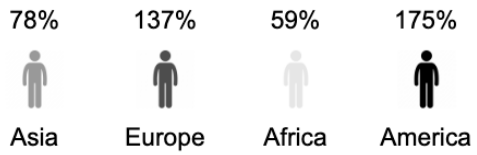

Fig 2. Visualization for showing the population fed by food / feed supplies

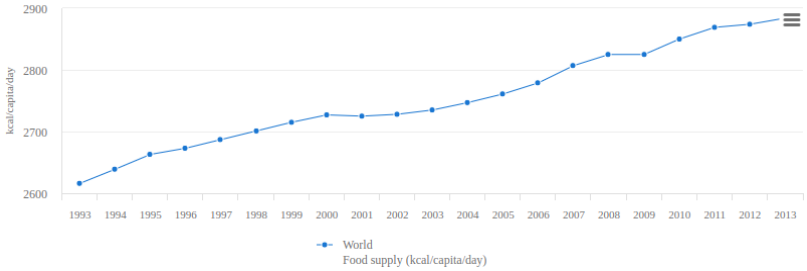

Fig 3. Visualization for showing the food / feed supply over time

We expect to see that richer continents have a surplus of food, while poorer continents may have a deficiency. Below this, we will visualize the total global food supply over time using a line graph. (See Fig. 3.) Moreover, we deem such figures important as the map visualization controlled by the timeline slider cannot effectively show how the food supply quantities have evolved over time.

Another interesting question is to show the different aliment types for both food and feed categories. While this can be visualized by a pie chart, we decided to use a treemap chart (See Fig. 4.) to better show the categories of different aliment types and subtypes (e.g. "food" > "meat" > "pork").

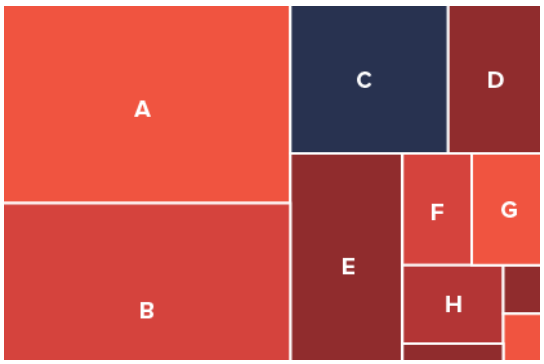

Fig 4. The treemap chart that shows different types of aliments

In addition to the visualizations listed above, we also comment some challenging ideas that could be utilized in our project: 1) The map in our main visualization (Fig. 1.) can be made a cartogram. However, a smooth transition while moving the timeline slider should be designed and this would be quite complex. 2) A graph showing what-food-goes-where can be shown, making the flow of food more intuitive. Given the time and page limit we defer these ideas to further discussions.

Tools

Multiple data visualization tools and techniques are required, including:

- Python, numpy for data processing;
- HTML (Lecture 1) for setting up the website;
- CSS (Lecture 1) for setting up the website;
- JavaScript (Lectures 2/3) for setting up interactive widgets;
- D3.js (Lecture 4) for visualizing the dataset in general;
- Interaction (Lecture 5) for setting up interactive widgets;
- Perception colors (Lecture 6) for coloring our visualization;
- Maps (Lecture 8) for our core map visualization.