**Description Template:**

Provide the following information for the image you create:

* **Image:** The visualization itself as an image
* **Visual Design Type:** The name/type of the visual design
* **Name of Tool:** The tool that was used to generate the image
* **Diet Groups**: The diet groups shown
* **Variables:** the other data attributes shown and *why you chose them*
* **Visual Mappings:** Each of the visual design mappings.  Include the data mapping information about **color**, **position** (x,y axes), **shape**, **size**, **hierarchy**, and any other visual mappings.
* **Unique Observation:** Things we can learn from the visualization, e.g, from this visualization we can see this pattern…  Make sure you describe *where and how* in the imagery your unique observation can be seen.  Is it shown in the accompanying video?  If so, at what time in the video?  Note that outliers are normally very interesting.  They indicate that something unusual is happening.
* **Data Preparation:** Any modifications to the original data that had to be performed to generate your beautiful image.
* (**Optional**) **URL** to **screen-capture demo** showing any animation or user-interaction.  You can include a link to a YouTube or Vimeo video to demonstrate any interaction or animation (similar to CW1).  I recommend two minutes maximum time.  Due to the large volume of submissions, we will not have time to look at and interact with Tableau public software web pages.  Therefore, we require a video.
* **(Optional) URL to source code:** if you used a programming language like R or Python you can provide a link to GItLab or GitHub where your code is stored.

**Visual Design Type**: Scatter plot, Treemap

**Name of Tool: Jupyter Notebook (Python)**, dycharts, processon.

**Diet Groups:** vegan, veggie, fish, meat <50, meat 50-100, meat >100

**Classification based on environmental friendliness score: ?(should I put this>)**

**Variables: GHG\_Bio score and Water score? And the reason will be long and repeated in preparation part…**

**Visual Mappings:**

For the **Scatter plot** in the middle:

**-color:** color is mapped to the differences between groups with different environmental impacts.

**-position: X-axis** represents the quantified impact on greenhouse gas emissions and biodiversity. The higher the GHG\_Bio score means that this grouping will eliminate more greenhouse gases and cause greater damage to biodiversity.

**Y-axis** represents the quantitative impact of a certain grouping on water resources. This combines water usage with local water scarcity. The higher the score, the greater the overall damage to water resources caused by this case.

**Therefore**, the position of each scatter point is scored by the comprehensive impact of each grouping case on the environment (GHG\_Bio score in X-axis and Water score in Y-axis).

For surrounding **Treemaps:**

**-color:** Color is mapped to different diet groups. The colors of different diet groups of all Treemaps are unified to better observe the changes of diet groups with their environmental impact scores.

**-position:** This is a two-layer Treemap. The position of the outer Treemap is calculated from the average score of different diet groups for the environment. Vegetarian with a lower average score is placed in the upper left corner, and meat with a higher average score is placed in the lower right corner. (Rather than using quantity as the basis for location, such a location arrangement is more conducive to observing the changes in the diet group as the environmental score changes.)

The position in the inner loop represents the age group distribution in each diet group, which is also unified and arranged in order from small to large.

**-size:** size represents the quantity between the two levels. The outer layer is used to compare the number and proportion of different diet groups within a certain environment score group. The inner layer is used to compare the number of age groups in a specific diet group.

**- hierarchy:** The cases are grouped by diet group -🡪 age group -🡪 number of cases.

**Unique Observation:** Reducing meat intake appears to have less impact on water conservation than reducing greenhouse gases and protecting biodiversity. Controlling one variable, that is, assuming that they are all within the low GHG\_Bio score range, comparing the three Treemaps, although the proportion of vegan and veggie is gradually decreasing as the water score increases, they still occupy a part.

As for the change in the X-axis direction, that is, the score of GHG\_Bio increases, the proportion of Veagn and veggie disappears almost immediately.

2. There may be data distortion for the age 70-79. Among the three regions with the highest scores for emitting greenhouse gases and destroying biodiversity, age 70-79 has a higher proportion. This is counter intuitive, and I suspect it may be because the data is balanced for calories, pulling the calories out to 2000 in each case. This may result in older adults who tend to eat less but more refined foods being over-represented, thus magnifying their effects on environmental damage.

**Data Preparation: It so long….**