

## Checkpoint IV: First Prototype

Group: G09

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### Layout



On the top of the first prototype interface, we have the **header** of the page with the title of our project (Nutrition Explorer), a counter and bar showing the number of the items currently visible.

Underneath, we have our first idiom: the **Parallel Coordinates plot** as well as a **List of a sample of 20 food items** that are currently present in the plot (items are encoded by lines that cross every column).

Underneath, there is the **TreeMap**. The user can observe 10 rectangles with sub rectangles representing each Category and its Types. The size of the rectangles is proportional to the quantity of items in the Category/Type present in the dataset. The types are grouped per category and have the same colour hue.

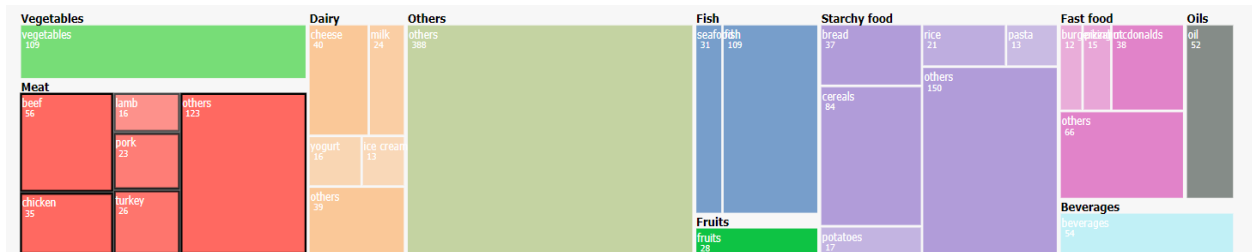
Lastly, we have **six Jitter plots**, each one comparing two Categories by a specific attribute and their recommended daily doses of that said attribute. The attribute and its measurement unit are displayed above each plot. The category at the left column in every plot contains the Selected Category.

These idioms will be all linked and can be updated, modified or filtered using the other idioms as we are going to explain further on.

### Visual Encoding

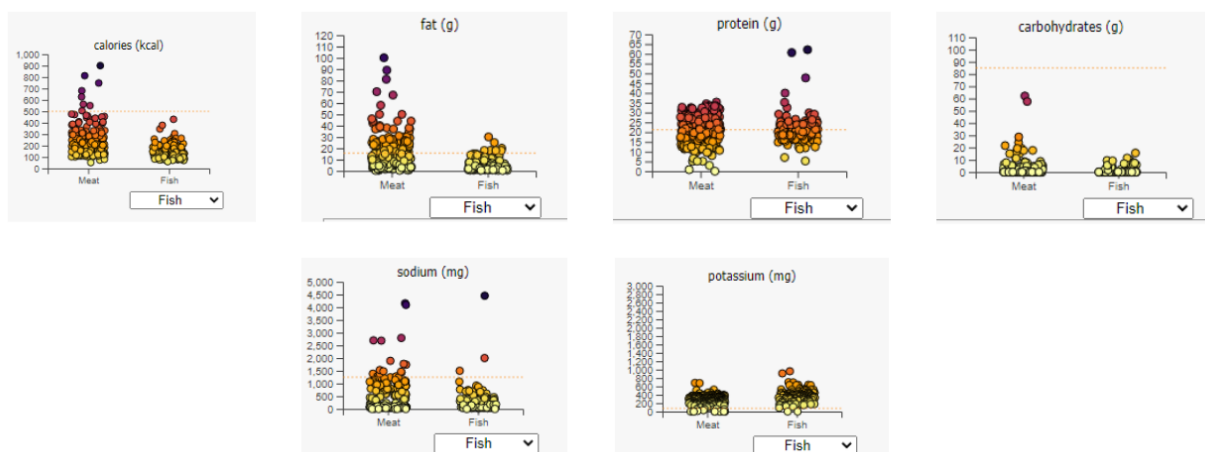
Despite being designed and working, the **Parallel Coordinates plot** isn't yet fully implemented. Although it is already filtering all the food items and highlighting those hovered over in the List, it has yet no interactivity with the other idioms as desired.

The **Treemap** shows the composition of the dataset by dividing it per categories. Each **Category** is represented with a **rectangle** mark and its channel, size, represents their affluence in the dataset. Each category is encoded by the same unique colour hue in this idiom and in the Parallel Coordinates. When the user hovers over a rectangle it shows a border. The user can press a rectangle that corresponds to a Category and the **selection propagates** to the Jitter plots in this first prototype. When a Category is selected, a **darker border** appears on its rectangle to mark the selection. It also starts displaying that Category in the left column of each Jitter plot.



Regarding the **six Jitter plots**, we chose to represent one plot for each of these attributes: *calories*, *fat*, *protein*, *carbohydrates*, *sodium* and *potassium*, since all of them have a reference value on the reference table. Each plot usually has **two Categories** encoded in the **x-axis** and shows the distribution of the items given their quantity of that attribute in the **y-axis**. The Category represented at the left is **“fixed”** (the Category selected in the TreeMap). The right one has a **drop-down menu** that lets the user select a Category to compare with the fixed one. This drop-down menu can be shown by clicking on the button with a category, under the plot. There is also an **orange dashed line** that represents the recommended dose of that attribute per serving size. When the user selects the same category in both the Treemap and drop-down menu, the plot only shows one column.

Each plot was created **independently** using a function that receives the **attribute** to be compared. We have an **update** function for the cases when the user **changes** the comparing category (using the drop-down menu) or the **“fixed”** Category (by clicking on its rectangle on the Treemap). When the user **hovers over a circle**, the item is **highlighted** in every Jitter plot that contains that item and its **name is shown** near the cursor.



In the initial state, **Meat is the selected Category** in the Treemap, therefore it is the category displayed on the left of each Jitter plot. Fish is the default right category in all six Jitter plots, which can be changed afterwards by the user, using the drop-down menus.

## Implementation of Linking Mechanism

In terms of interactivity between these idioms:

- When a **category is chosen** by **clicking** on one rectangle of the **Treemap**, the **Jitter plots** update, changing their left column ("fixed" category). The selected category can then be compared to others (taking advantage of the drop-down menu) and to the recommended doses of each one of the six attributes.
- When the cursor **hovers over** a point in the **Jitter plots**, the item is **highlighted** by thickening its border. If that item is present in more than one plots, it is also highlighted as well. The colour hue of the border is the item's category colour hue. It also shows the name of that food specific food item.
- The **Parallel Coordinates** plot, when fully functional, can also be **filtered by the Treemap**, i.e., if the user selects a category, it will **only be shown items of that Category** in the plot and in the **List** next to it.
- The **filtered items** in the **Parallel Coordinates** will also have impact in the other idioms. The Jitter plots, for instance, will only present the items that respect the filter of the Parallel Coordinates for the selected categories.
- When **hovering over** an item in the **Parallel Coordinates**, we pretend to **highlight** that particular item too.
- When **clicking** on an item in the **Jitter plots**, the Category of that item is **selected** and the **Parallel Coordinates is filtered** to show only the items for that chosen Category.
- If possible, we also plan to add an **animation** to the **Treemap**. When a category is selected, all the types would then appear instead of our current model where they are all showing. We still do not know if this is a viable option or even if it would significantly benefit our visualization.