

Here I have chosen *cereals dataset* in order to develop a prototype of visualization system.

Link: <https://web.cs.kent.edu/~hlella/finalwork.html>

1. Identify at least three visualization tasks for the dataset:

So for the given data set we need to identify the tasks that is the first step in this project.

Some of the tasks identified in this dataset are as follows:

- What is the average protein content that each manufacturer produces?
- What is the relationship between all the variables in the dataset?
- What is the amount of sodium and potassium content that is present cups of serving?
- What is the average calories content that each manufacturer generates?
- What is the relation between calorie, protein, fat, carbohydrates and sugar in the given data?
- What is the amount of calories to potassium, and amount of carbohydrates to potassium level that the food contains?

Step 2: Design a visualization system to fulfill the identified tasks:

So based on the above tasks we need to design a visual system. So we will design this by taking each task.

- What is the average protein content that each manufacturer produces?

For this we can show the average protein of each manufacturer using different charts. I am using *interactive donut chart* to show this which is effective for perception and easy to understand. We will consider two attributes one is protein and other one is manufacture. First we will calculate the average protein based on each manufacturer then we will plot the chart. I also used *Interactive design* in this chart where initially we can see the complete chart the user can disable or neglect the manufacturer which he doesn't want.

- What is the relationship between all the variables in the dataset?

So here in order to show the relationship between all the variables in the dataset I would suggest the *interactive parallel coordinates* which will show relation between the each

attribute of the data. Here a interactive design is also built for this chart, user can just hover on the each axis and see the related products that which he wants in his range.

- What is the amount of sodium and potassium content that is present cups of serving?

The best way I prefer to show this chart is by using ***interactive scatter plot***. As we have three attributes that needs to be considered so we are going with this plot. So we show the potassium content on x-axis and sodium content on y-axis with cups per serving as radius. I have design a interactive scatter plot user can hover on his interested manufacturer shown on the right side. Even user can hover on the scatter points so that he can see the quantity of sodium and potassium.

- What is the average calories content that each manufacturer generates?

This is as same as above average protein chart. I am using ***interactive donut chart*** to show this which is effective for perception and easy to understand. We will consider two attributes one is calories and other one is manufacture. First well calculate the average calories based on each manufacturer then we will plot the chart. I also used *Interactive design* in this chart where initially we can see the complete chart the user can disable or neglect the manufacturer which he doesn't want.

- What is the relation between calorie, protein, fat, carbohydrates and sugar in the given data?

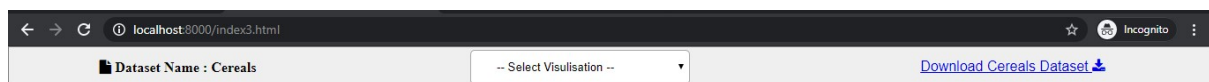
Here we need to show the relationship between calorie, protein, fat, carbohydrates and sugar so I would choose ***interactive scatter plot***. As clearly mentioned in the task itself what all the attributes that we need to consider for this visualization. I am building a interactive scatter plot which will distinguish each manufacturer separately with different colors. So that user can identify relationship easily.

- What is the amount of calories to potassium, and amount of carbohydrates to potassium level that the food contains?

So in order to show this I would say **Zoomable scatter plot** would perfectly suits the requirement. So we will built by considering the calories, potassium and carbohydrates, initially amount of calories to potassium is sown and on clicking in the button below provided on the page we can check the amount of carbohydrates to potassium level that the food contains. User can zoom in and zoom out the data.

3. Implement the Web-based visualization system with interactions:

So now comes the implementation part what all the things that we discussed in the design part we are going to implement them here.

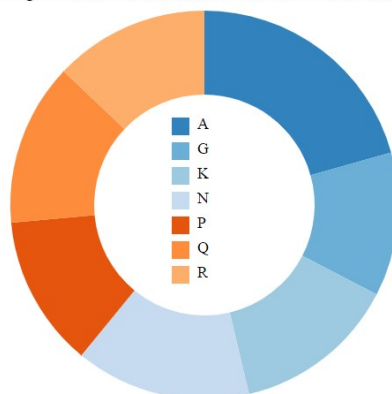


The above is the homepage where user can select the visualization according to his requirement then it will give the desired visual representation.

- What is the average protein content that each manufacturer produces?



Average Protein of each Manufacturer Interactive Donut chart

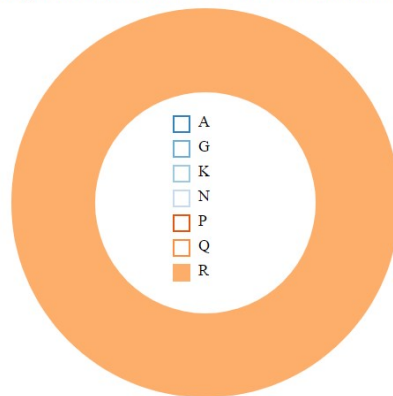


 Dataset Name : Cereals

Interactive Protein Pie Chart

[Download Cereals Dataset](#)

Average Protein of each Manufacturer Interactive Donut chart



The above displayed is the interactive donut chart for cereals data. Here it shows the average Protein that each manufacturer food products contains. *It is interactive please hover on the chart as well as click on the button to show only specific manufacturers.*

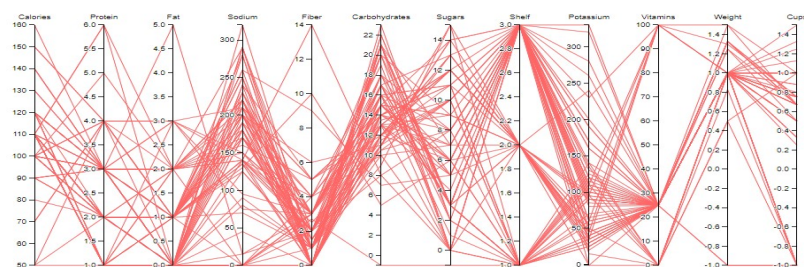
- *What is the relationship between all the variables in the dataset?*

 Dataset Name : Cereals

Interactive Parell Coordinates

[Download Cereals Dataset](#)

Cereals Parallel Coordinates chart

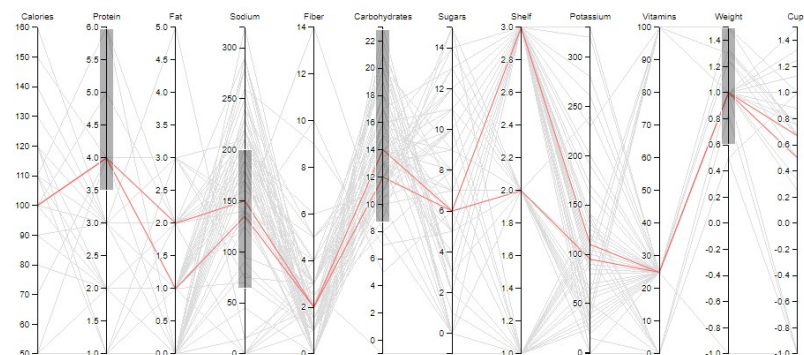


 Dataset Name : Cereals

Interactive Parell Coordinates

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Cereals Parallel Coordinates chart



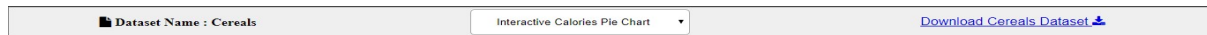
The above is the Parallel coordinates chart on the Cereals dataset we see the mapping of all data, *Here we can drag the cursor and choose the range of products that one needs in their diet.*

- *What is the amount of sodium and potassium content that is present cups of serving?*

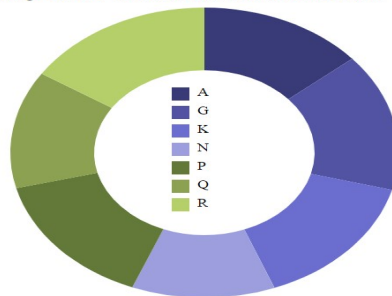


The above is the interactive scatter plot for cereals data. Here it distinguishes for each manufacturer the amount of potassium and sodium content present per serving cup. *Choose the specific Manufacturer on right that will be highlighted in the plot.*

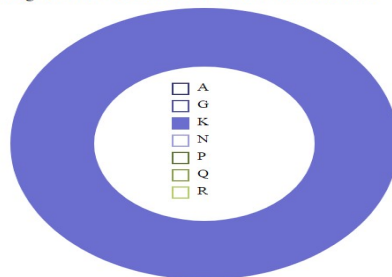
- ***What is the average calories content that each manufacturer generates?***



Average Calories of each Manufacturer Interactive chart



Average Calories of each Manufacturer Interactive chart

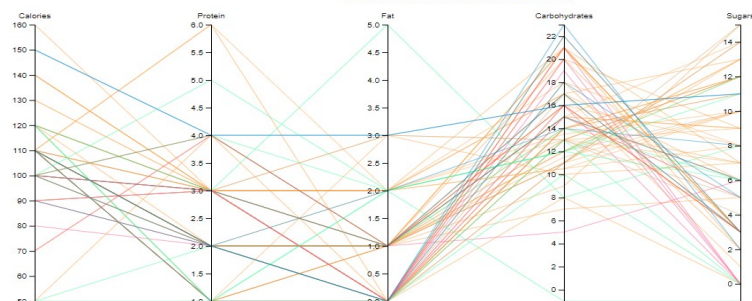


The above displayed is the donut chart for cereals data. Here it shows the average calories that each manufacturer food products contains. ***It is interactive please hover on the chart as well as click on the button to show only specific manufacturers.***

- ***What is the relation between calorie, protein, fat, carbohydrates and sugar in the given data?***

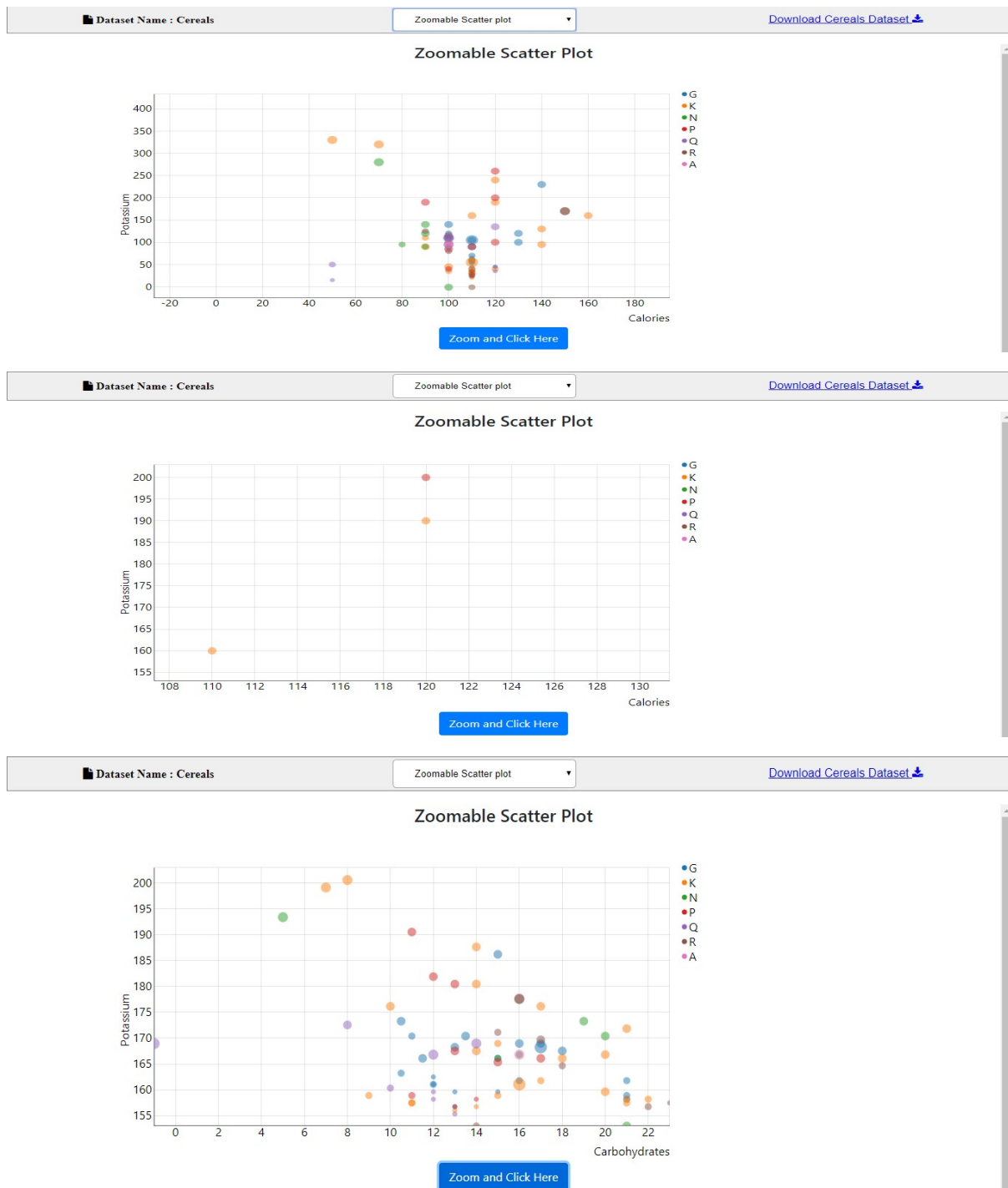


Cerals Parallel coordinates chart



The above is the Parallel coordinates chart on the Cereals dataset with calorie, protein, fat, carbohydrates, Sugar and if you hover it will show this for the different Manufacturer of the given data which is distinguish by different colors.

- *What is the amount of calories to potassium, and amount of carbohydrates to potassium level that the food contains?*



The above is the zoom able scatter plot which is built on cereals data. Here we have shown the amount of calories to potassium, and amount of carbohydrates to potassium level that the food contain. You can hover on the circle to see the exact amount.