



Parallel Coordinates

Introduction

Panel 1: Two stick figures are working out with weights. One is squatting with a barbell, and the other is standing with a barbell.

Panel 2: The same two figures are now looking at a fruit stand with various fruits like apples, oranges, and bananas in boxes.

Panel 3: A speech bubble says, "There are so many fruits, which ones should we chose?" Below the fruit stand, there are three stick figures looking at a large screen showing a 2D scatterplot with axes labeled "Calories (gr.)" and "Fibers (gr.)".

Panel 4: The text on the screen says, "we map "Calories" on the vertical axis and "Fibers" on the horizontal axis." An arrow points to a point labeled "Kiwi!". A callout says, "This shows us which fruits have high in fibers and low in calories."

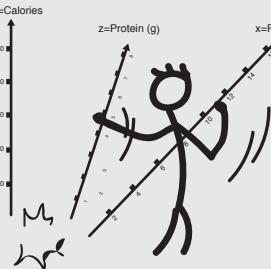
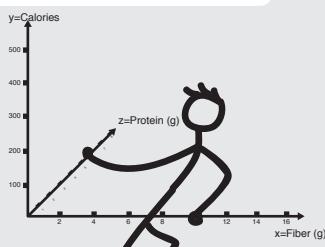
Panel 5: The text on the screen says, "Now, what about proteins? we could add a 3rd spatial dimension, .. perhaps." Three stick figures are looking at a screen showing a 3D scatterplot with three axes.

Panel 6: The text on the screen says, "That does not look like a good solution ... can you spot which fruit has the most proteins?" A scatterplot is shown with axes "Calories (gr.)" and "Fibers (gr.)" and a third axis pointing towards the top right. Three question marks are floating above the plot.

Panel 7: A speech bubble says, "Guys, this is not going to work. How should we map all the other nutrients? water? Calcium? Carbohydrates, Fat, etc..". Below the speech bubble, a stick figure is shown with a very tangled line representing multiple dimensions.

Panel 8: The fruit stand from Panel 3 is shown again, with three stick figures looking at it.

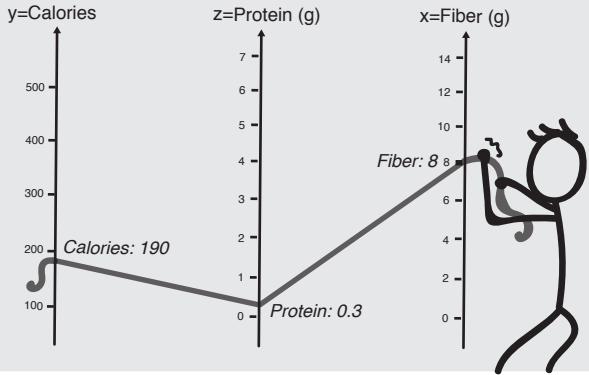
Let's change the arrangement of the axes...



...like so :



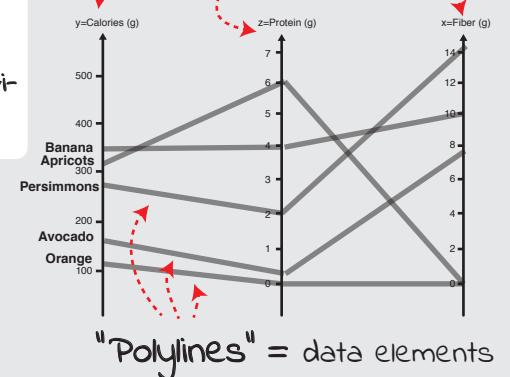
We now connect the values for each fruit with a line.



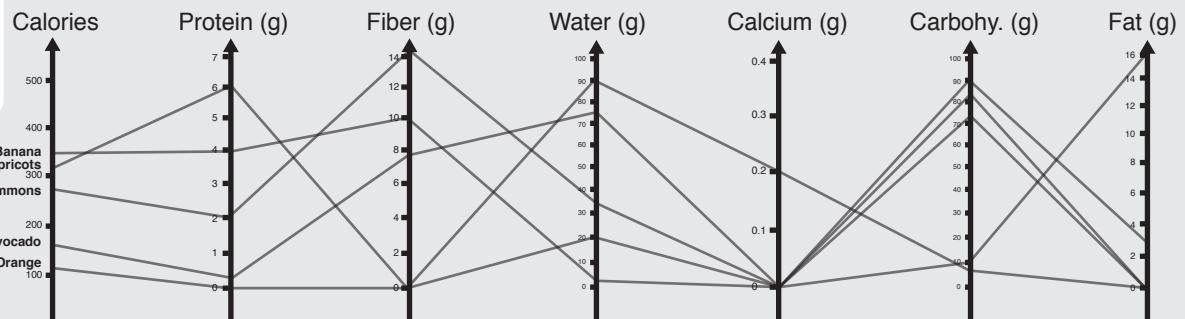
And obtain our Parallel Coordinates Plot (abbreviated: PCP).



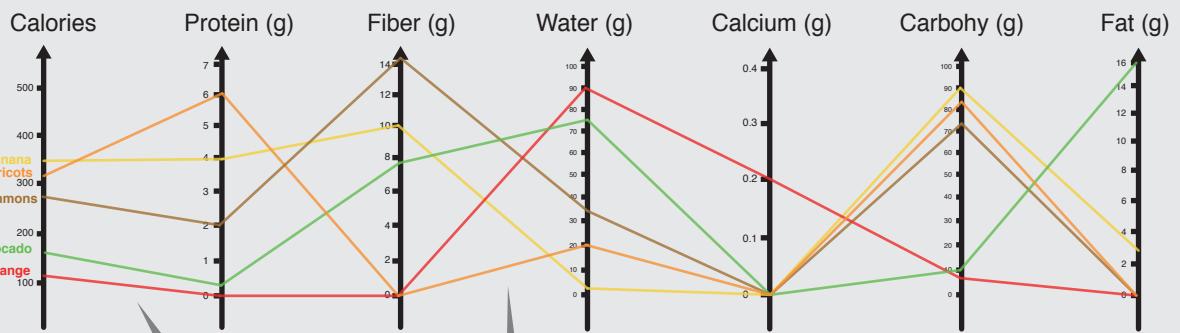
"Axes" = Dimensions



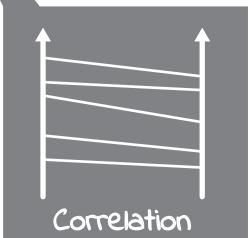
See how we can show many dimensions?



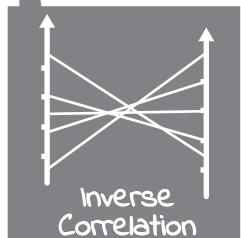
For better readability, let's add colors.



PCPs can show correlations between dimensions, depending on how the polylines cross and cluster.

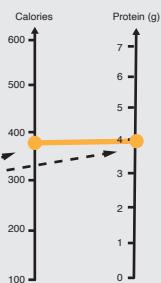


The polylines are rather parallel.

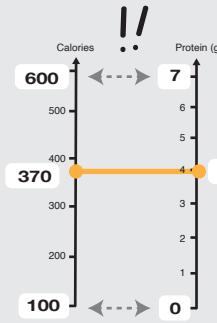


The polylines are rather crossing.

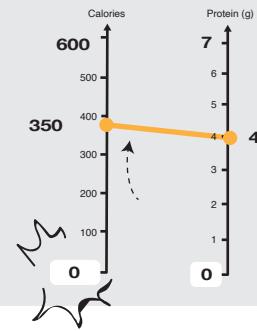
It looks like
Bananas got the
same amount of
calories than they
have proteins!



Not really! Look at
the axis labels: the
scales are differ-
ent and one axis is
not even starting at
'0', but 100!

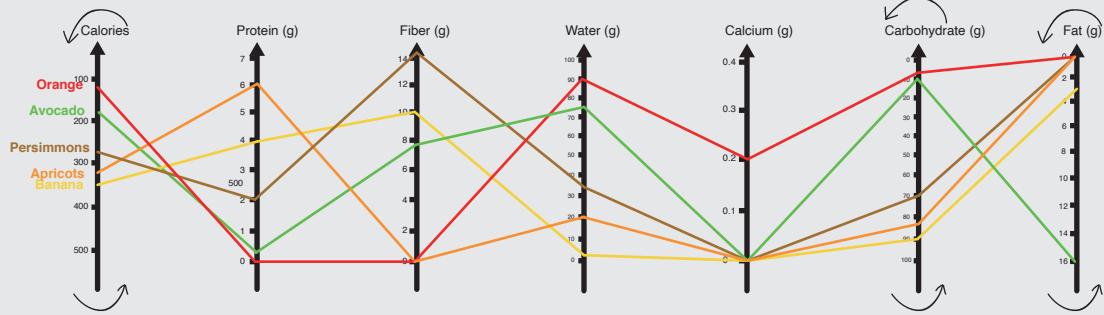
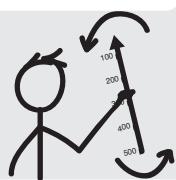


Let's correct at least the
truncated axes to '0'.

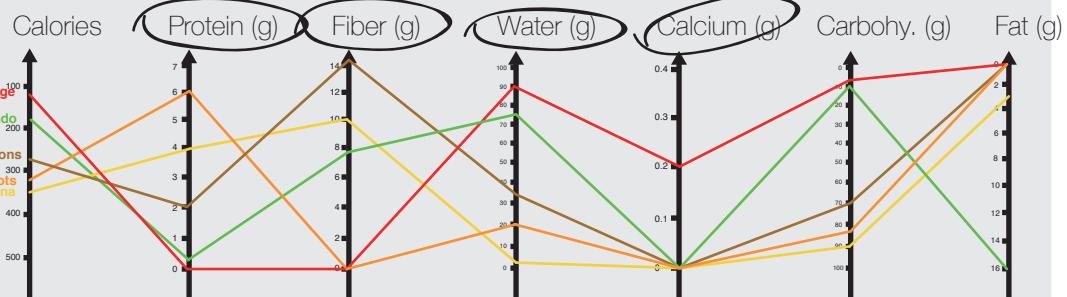


Also, make sure all axes are oriented so that high values can be compared in a meaningful way.

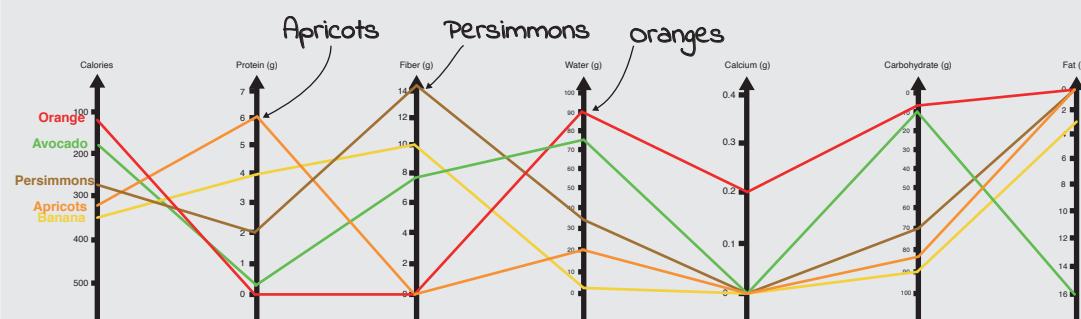
For example, this can
mean that higher values
are up, or as in our
example, 'desired' values
are up, like low fat.



Try picking the three
types with the highest
in fiber, protein, water,
and calcium!



Cool! I've got my
decision! Let's buy some
persimmons, apricots
and oranges.



Sold out! we hesitated for too long!

