In between client work, John and I have been busy working on our book, [*Practical Data Science with R, 2nd Edition*](http://practicaldatascience.com/). To demonstrate a toy example for the section I’m working on, I needed scatter plots of the petal and sepal dimensions of the iris data, like so:

I wanted a plot for petal dimensions and sepal dimensions, but I also felt that two plots took up too much space. So, I thought, why not make a faceted graph that shows both:

Except — which columns do I plot and what do I facet on?

head(iris)

## Sepal.Length Sepal.Width Petal.Length Petal.Width Species

## 1 5.1 3.5 1.4 0.2 setosa

## 2 4.9 3.0 1.4 0.2 setosa

## 3 4.7 3.2 1.3 0.2 setosa

## 4 4.6 3.1 1.5 0.2 setosa

## 5 5.0 3.6 1.4 0.2 setosa

## 6 5.4 3.9 1.7 0.4 setosa

Here’s one way to create the plot I want, using the [cdata](https://cran.r-project.org/package=cdata) package along with [ggplot2](https://cran.r-project.org/package=ggplot2).

First, load the packages and data:

library("ggplot2")

library("cdata")

iris <- data.frame(iris)

Now define the data-shaping transform, or *control table*. The control table is basically a picture that sketches out the final data shape that I want. I want to specify the x and y columns of the plot (call these the *value columns* of the data frame) and the column that I am faceting by (call this the *key column* of the data frame). And I also need to specify how the key and value columns relate to the existing columns of the original data frame.

Here’s what the control table looks like:

The control table specifies that the new data frame will have the columns flower\_part, Length and Width. Every row of iris will produce two rows in the new data frame: one with a flower\_part value of Petal, and another with a flower\_part value of Sepal. The Petal row will take the Petal.Length and Petal.Width values in the Length and Width columns respectively. Similarly for the Sepal row.

Here I create the control table in R, using the convenience function wrapr::build\_frame() to create the controlTable data frame in a legible way.

(controlTable <- wrapr::build\_frame(

"flower\_part", "Length" , "Width" |

"Petal" , "Petal.Length", "Petal.Width" |

"Sepal" , "Sepal.Length", "Sepal.Width" ))

## flower\_part Length Width

## 1 Petal Petal.Length Petal.Width

## 2 Sepal Sepal.Length Sepal.Width

Now I apply the transform to iris using the function rowrecs\_to\_blocks(). I also want to carry along the Species column so I can color the scatterplot points by species.

iris\_aug <- rowrecs\_to\_blocks(

iris,

controlTable,

columnsToCopy = c("Species"))

head(iris\_aug)

## Species flower\_part Length Width

## 1 setosa Petal 1.4 0.2

## 2 setosa Sepal 5.1 3.5

## 3 setosa Petal 1.4 0.2

## 4 setosa Sepal 4.9 3.0

## 5 setosa Petal 1.3 0.2

## 6 setosa Sepal 4.7 3.2

And now I can create the plot!

ggplot(iris\_aug, aes(x=Length, y=Width)) +

geom\_point(aes(color=Species, shape=Species)) +

facet\_wrap(~flower\_part, labeller = label\_both, scale = "free") +

ggtitle("Iris dimensions") +

scale\_color\_brewer(palette = "Dark2")