

PP4RS | R Module

Slot 6

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10.09.2018

Outline of the R-Module

Slot 1: Intro & Data Types

Slot 2: Conditionals and Functions & Loops

Slot 3: Read in Data

Slot 4: Data Manipulation

Slot 5: Regressions

Slot 6: Graphs

Slot 7: knitr

Now: Graphs

Not all graphs are created equal

Principles for nice graphs¹

Once upon a time, a picture was worth a thousand words. But with online news, blogs, and social media, a good picture can now be worth so much more. Economists who want to disseminate their research, both inside and outside the seminar room, should invest some time in thinking about how to construct compelling and effective graphics.

"Picture Superiority Effect": ability of humans to retain more information seen through pictures than through words

[1] Source: Schwabish, Jonathan A. 2014. "An Economist's Guide to Visualizing Data." Journal of Economic Perspectives, 28 (1): 209-34. [Link to the Paper](#)

Principles for nice graphs

1. Show the data
 - People look at graphs at first
 - Data are most important part of the graph

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 - ornamental shading and gradients
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There is a **Cheatseet** for this.

Let's have a look at good and bad graphs in the paper itself!

Details

For more details, check the paper yourself. It includes topics like:

- Colors: tools for creating nice, consistent colors and that also work with greyscale when printed
- Fonts
- Maps
- Infographic tools

[Website](#) of the author with more data visualization info.

Graphs in R

How to graph in R

As you can imagine, there are lots of packages and functions around graphs.

Base functions:

- `plot()`
- `lines()`
- `barplot()`
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We will use `ggplot2`, the most common package for graphs.

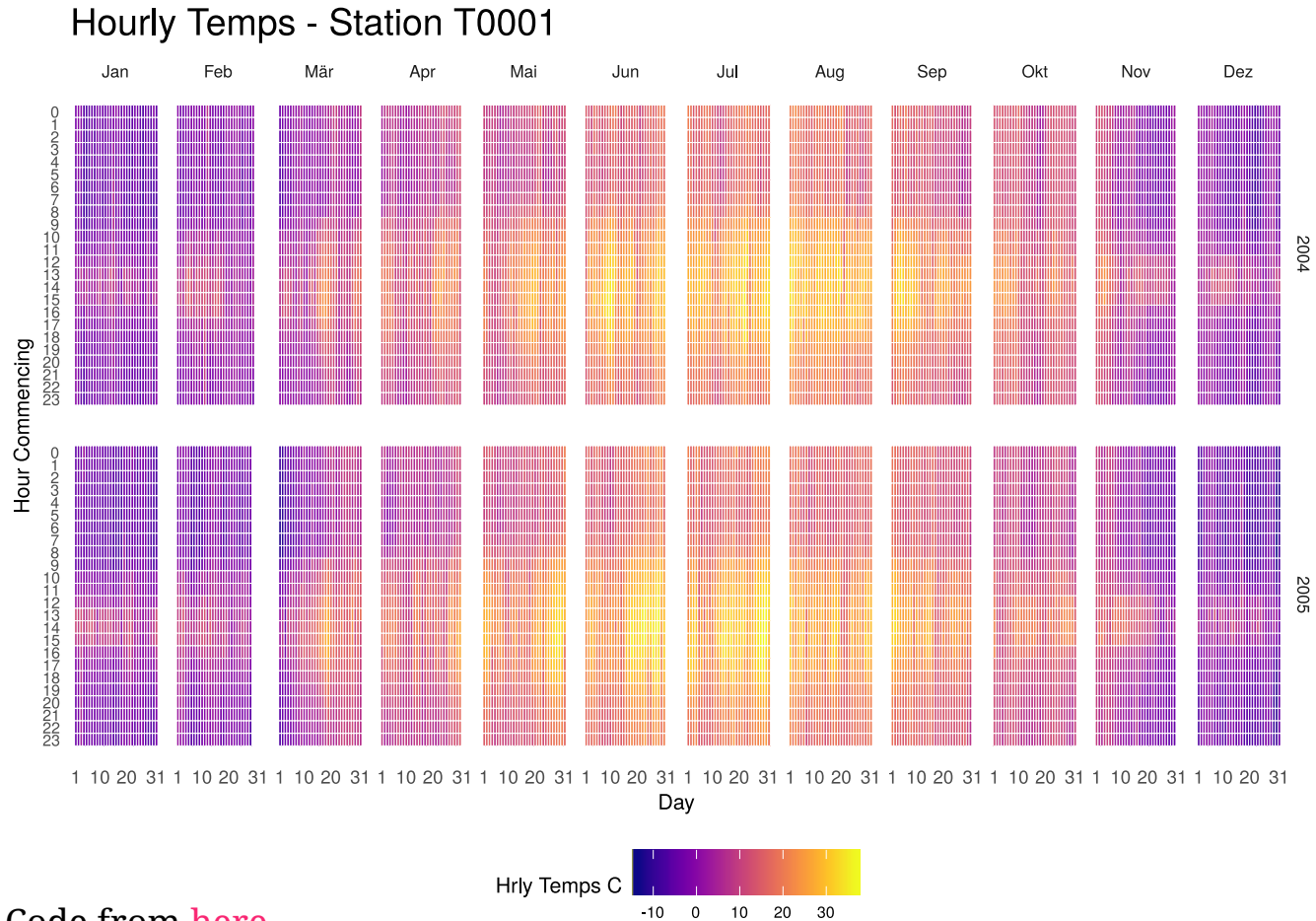
- It can do everything that the base functions can do
- Has a nicer syntax
- Better output quality
- More options

The power of ggplot



Code from [here](#)

The power of ggplot



Code from [here](#)

Resources

- base plots in R: [Examples with code](#)
- fancy graphs in R: [R Graph Gallery](#)
 - Look at fancy graphs and their code
 - All sorts of functions, not only ggplot
- ggplot2 [cheatsheet](#)
- ggplot2 [references](#) - better than the usual helpfiles!

Some examples are found in a different slideset.

Exercise

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We are going to replicate Figure 1 from the Income and Democracy paper of Friday.

Follow these steps:

1. Read in the raw data
 - Read in the sheet named "F1" from the raw data folder of Friday
 - Rename `lrgdpch` to `log_gdp_pc` and `fhpolrigaug` to `freedom_house`
2. Start the plot
 - Log GDP per Capita should be on the x-axis
 - the measure of democracy should be on the y-axis
3. Add a scatterplot and choose a good point size
4. Fit a smooth line to the data
 - choose the method to be used
 - you can adjust the appearance such as the color, the size and the transparency
5. Adjust the axis labels to be nicely readable
6. Add the country names as labels into the plot (hint: use `geom_text()`)
 - you can adjust their size as well

Additional Exercise

Recreate Figure 2 from the Income and Democracy paper of Friday.

Follow these steps:

1. Read in the raw data
 - Read in the sheet named "F2" from the raw data folder of Friday
 - Rename `s5fhpolrigaug` to `freedom_house_change` and `s5lrgdpch` to `log_gdp_pc_change`
2. Repeat the same steps as before for creating the plot
 - adjust the axis labels
3. Save your plot with `ggsave`

Solutions

Read in the raw data

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Saving plots:

In order to view a plot, just print it (e.g. `my_plot` or `print(my_plot)`)