This is Ralf’s Material

**Designing computer lab classes.**

Running computer labs online will be a serious challenge for any econometrics course with a practical component. It is likely that we will have to provide students with more detailed instructions on how to achieve what we want them to achieve with an econometric software. This is as we are likely to have to rely more on students working through problems by themselves. The quick look over the shoulder in a computer lab is not a tool we may have available.

This also means that we will have to improve the coding resilience of our students, meaning that we will have to help them develop and practice the skills and tools required to overcome difficulties when coding. This is true whether you are asking your students to learn a menu-driven econometric software (like EViews or SPSS) or a code based software (like STATA, R, Python or MATLAB).

The generic skills which are likely to help your students are

* Using the help function
* Searching on the internet for help
* Understanding error messages and
* Finding errors or debugging

It is therefore important to not only present your students with pristine and fully working code or instructions on how to achieve certain things, but you also need to expose them to the difficulties and frustrations they are likely to encounter and to the above strategies which will eventually allow them to overcome these difficulties.

In this [online video](https://youtu.be/_2BdrTLTgFs) (YouTube, 11.29 min) Ralf Becker (University of Manchester) discusses how to include such elements into a computer lab. He uses R as an example but the same principles apply to any other software.

The following material is used in this clip:

Datafiles: [Mobility Data](https://www.dropbox.com/s/m1e3m9sw5ee7mm0/Global_Mobility_Report.csv?dl=0), [Covid-19 policy and case data](https://www.dropbox.com/s/jgo0kdf4adg4nam/OxCGRT_latest.csv?dl=0)

Basic Computer Lab: [Worksheet](https://www.dropbox.com/s/74pldxy780mnu8s/Tutorial---Covid---basic.pdf?dl=0), [Rmd code for worksheet](https://www.dropbox.com/s/8xydykylhneboxv/Tutorial%20-%20Covid%20-%20basic.Rmd?dl=0)

Skill-based Computer Lab: [Worksheet](https://www.dropbox.com/s/k2w5hdvtr7fw5q7/Tutorial---Covid---skills.pdf?dl=0), [Rmd code for worksheet](https://www.dropbox.com/s/m40y4w0hqx8qypq/Tutorial%20-%20Covid%20-%20skills.Rmd?dl=0)

You could also think of providing your students with a basic [cheat sheet](https://www.dropbox.com/s/tzaubjo11gys9b9/BeginnersCheatsheet%20v1.0.pdf?dl=0) which does have a section on the generic coding skills.

**RStudio Cloud**

In case you are using R as your econometric software, you may be wondering how to run computer labs online.

As R and its most commonly used front-end, RStudio, are free softwares, all students can download these and install them on their own computers. But there is an issue. If you do this, then you need to expect to help many of your students in that process. And while the installation process is normally quite straightforward, it also means that you and your students have to spend time on this process before you have even added 2 + 2 in your software. When you have face to face classes the result is that I am typically happy if at the end of the first hour all students have a datafile loaded into the software.

There is a solution to this problem. You and your students can use R and RStudio in the cloud. All your students do need is a login from <https://rstudio.cloud/>. That is for free. You can then all use R on the web.

Importantly it means that you can ensure that all your students have access to exactly the same computing environment. You don’t have to worry about whether they have downloaded all required files. If you made them available they will be there. The same with packages, if you have them made available they will be there. All of this means is that that you can start doing cool stuff right from the start.

There are only two downsides:

1) For the time being the service is free. By default you can only have 10 people in a space (something like a class). But you can ask RStudio to give you more space. In the medium run they may start charging for that service.

2) All of that annoying stuff you avoid, installing, downloading packages etc. students will still have to learn for when they work by themselves. But if you use RStudio Cloud you can delay this pain until your students have understood what the value of the coding skill is. At that point it will be easier to get students to engage with that process.

So here are two places for you to start.

[Introduction to RStudio](https://www.youtube.com/watch?v=PviVimazpz8&feature=youtu.be) Cloud by Mel Gregory from RStudio (YouTube, 24.05 min)

A [cheat sheet](https://www.dropbox.com/s/n6v479ckxnofxmk/Cheat%20Sheet%20RStudio%20Cloud.pdf?dl=0) for Teachers using RStudio Cloud.