

# DS4B: Ongoing Tasks

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***Last update:*** *March 29, 08:53*

This document is a thread of the tasks that structure our class. Of course, not all of them will be documented here. It would be impossible to keep such a level of detail. But those below are certainly compulsory benchmarks.

Notice that the file will be updated in reverse chronological order (last section entries appear first; normal order *within* the section). That is meant to help follow the thread. The table of contents, specially on HTML-like formats, will be very useful to navigate the tasks.

The pdf file (and only it) is instructed to count the sections in reverse order.

A preview of the HTML file, which is easier to navigate, is available: [preview html here](#).

## 6 Lecture on March 29

### 6.1 Integrate the material

On the topics (see notes):

- data structures,
- simple functions,
- sub-setting,
- conditions,
- functions (time allowing).

### 6.2 Exercises

Check out the `Exercises.pdf` (or other format) file and answer the current set of exercises on:

- simple vectors creation,
- sub-setting,
- functions (time allowing).

## 5 Homework for March 29

### 5.1 Exercises

Check out the `Exercises.pdf` (or other format) file and answer the current set of exercises on

### 5.2 Set up GitHub for team collaboration

Access the chapter in my book and follow the instructions for setting up GitHub for team collaboration.

Importantly, this must be done **only once** you have created your own experimental repo on GitHub and have managed to push/pull code to/from it to your machine.

## 4 Lecture on March 22

### 4.1 Build minimal book on your machine

Install the required package, if you haven't done it: `install.packages("bookdown")`.  
Download the minimal bookdown example at <https://github.com/rstudio/bookdown-demo>.  
Copy all the files of that folder into your book folder.  
Change at least the three following files with self-describing fields (e.g., author):

```
. _output.yml  
. _bookdown.yml  
. index.Rmd
```

Build the book in different formats.  
That's all: you are ready to write your book.

### 4.2 Understand the role of the files in the folder

Analyze / change / add / remove files from your folder in order to understand how to structure a book with Rmd files. Check the following points (non-exhaustive list):

- . what files are included in the output,
- . how these files are structured and how they enter the book,
- . what is the role of the other files in the folder.

Get help at the book about bookdown, which is a book written with bookdown at <https://bookdown.org/yihui/bookdown/>.

### 4.3 Install a Git application

Another application needed in the class is a Git (<https://git-scm.com/downloads>) distribution. This is also a free software.

Once you have installed Git for your version control, activate it in RStudio: *Tools > Global Options > Git/SVN* and click on *Enable version control interface for RStudio projects*.

Also generate a SHH RSA key. We will use it to identify at the GitHub repo.

### 4.4 Sign for GitHub

Create an account at GitHub at <https://github.com>.

### 4.5 Create GitHub repo and link your machine to it

One member of each group must create a new repository (pronounced 'repo') whose name is **exactly** the same as your R project / book folder (e.g., 'myRbook').

On the top left menu in GitHub, go to *Settings > SHH and GPG keys* and click on 'New SHH key'. Paste the SHH key generated by RStudio.

In RStudio go to *Tools > Project Options... > Git/SVN*. Under *Version control system*, select 'Git'.

Still in RStudio, *Tools > Terminal > New Terminal*. This opens a Terminal where you can paste the message shown at the creation of the repo (changing the names, of course):

```
git remote add origin https://github.com/YOURNAME/YOURREPO.git  
git push -u origin master
```

Your local **master** should now be connected to the **master** on GitHub.  
If necessary, restart RStudio. At the restart, a Git thumbnail should appear in a pane. You are ready to commit and push your files.

## 4.6 Structure of the book

Make a first attempt at designing a structure for your book. Create empty chapters as placeholders.

## 4.7 First steps in R

Integrate the chapter on R as a calculator and the chapter on data structures in R.

# 3 Homework for March 22

## 3.1 Train the workflow

Play around with the example that we did in class to illustrate **reproducible research** (rr) and **dynamic documents** (dd).

The file is on GitHub, but I slightly modified the YAML in order to allow the illustration of cross-references of sections. This new format (`bookdown::pdf_document2`) requires a R package. Hence, you need to install it with `install.packages('bookdown')` or by using the menu *Tools > Install Packages...*

# 2 Lecture on March 15

## 2.1 Check your R/Rstudio/Latex installation

Create a new Rmd file *File > New File > R Markdown*. And then click on Knitr, possibly by choosing the output format on the scroll down menu (i.e., Knit to...).

If needed, install required packages (e.g., **knitr**).

```
install.packages("knitr")
```

Notice that, in order to create a pdf document, you must have a Latex distribution installed; similarly for Word output, Microsoft Word is necessary.

## 2.2 Create own Rmd file

Notice that every time such new file is created with the menu, it comes with pre-populated content. It can help, but it can also be annoying because you need first to erase it and start writing your stuff.

Your first Rmd can be a change in this default content or a copy from the class GitHub (or your very own).

## 2.3 Create class folders

In your machine, create a folder for this class. Within that folder, create a folder for your book. Members of the same group must have the **same name** for that book folder.

Put your first Rmd file into your book folder.

## 2.4 Create your project

*File* > *New project* > *Existing Directory* and chose that book folder.

Now, every time you create content for your book, you must start a Rstudio session *File* > *Open Project*...

All the files of the project are the files of the folder, and vice versa.

# 1 Prior to the first Lecture

## 1.1 Install applications

Please download the following FREE applications, available on all platforms:

1. R (<https://cran.uni-muenster.de/>)
2. RStudio, free Desktop version (<https://www.rstudio.com/products/rstudio/download/#download>)
3. A Latex distribution (e.g., MacTex for Mac or MiKTeX for Windows machines)

The first two are easily and quickly installed. The last is a very large program (a few Gb) and needs time to install.

## Planned tasks

This is a very incomplete list of tasks that will enter our workflow at some point. They are mentioned here for a reference.

### Include images

### Referencing of sections/figures/equations. . .

### Introduction to Latex

This is particularly important for writing math expressions and for output customization.

### Introduction to html customization (css)

As requested by Mr. Miebach.

### Easy slides in RMarkdown

As requested by Mr. Gaulke.