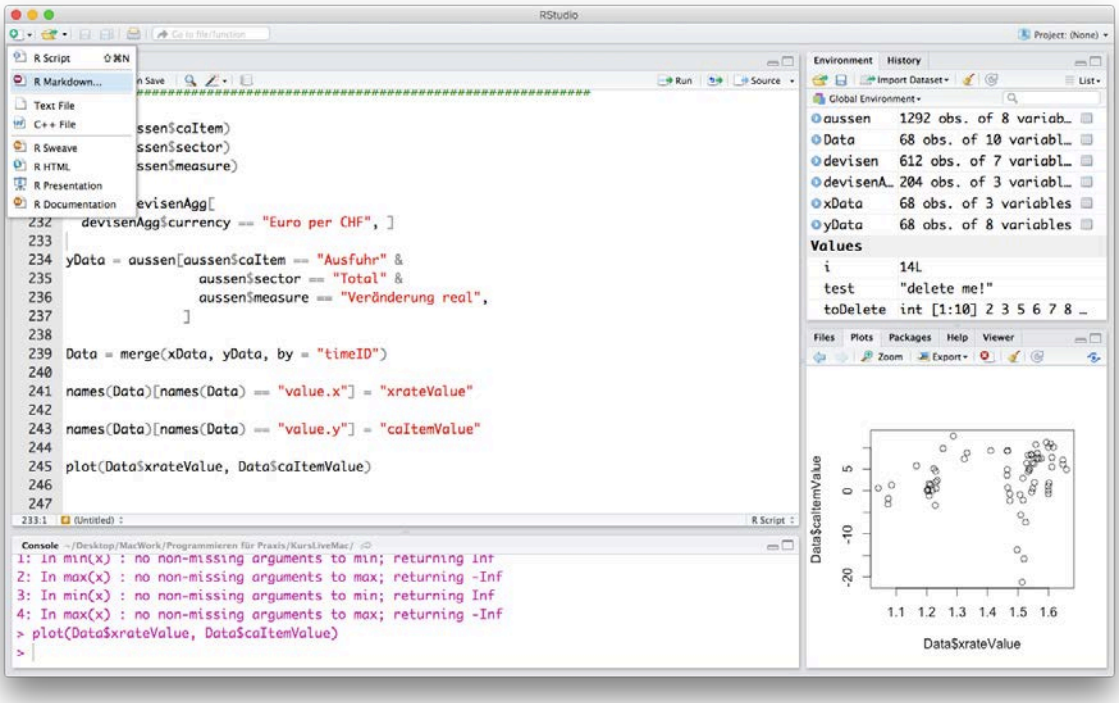
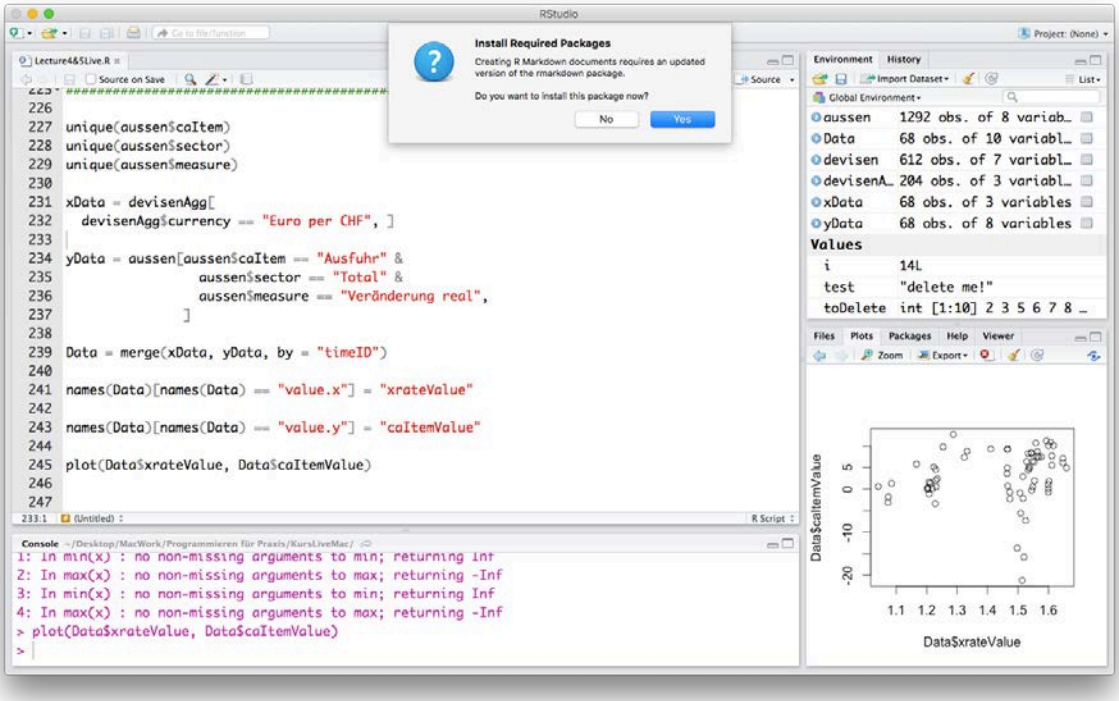
Installing and Running RMarkdown and Latex

In RStudio, when you click on the little symbol with an empty document and a plus sign (see screenshot below), you get a menu item `R Markdown`. This is a pretty powerful documentation tool that is integrated in R studio. You can use it to generate websites (i.e. html documents, to be more precise), pdf documents (if you have installed an open-source program called Latex or TeX, as discussed below), and Microsoft Word documents (if you have installed Microsoft Word).

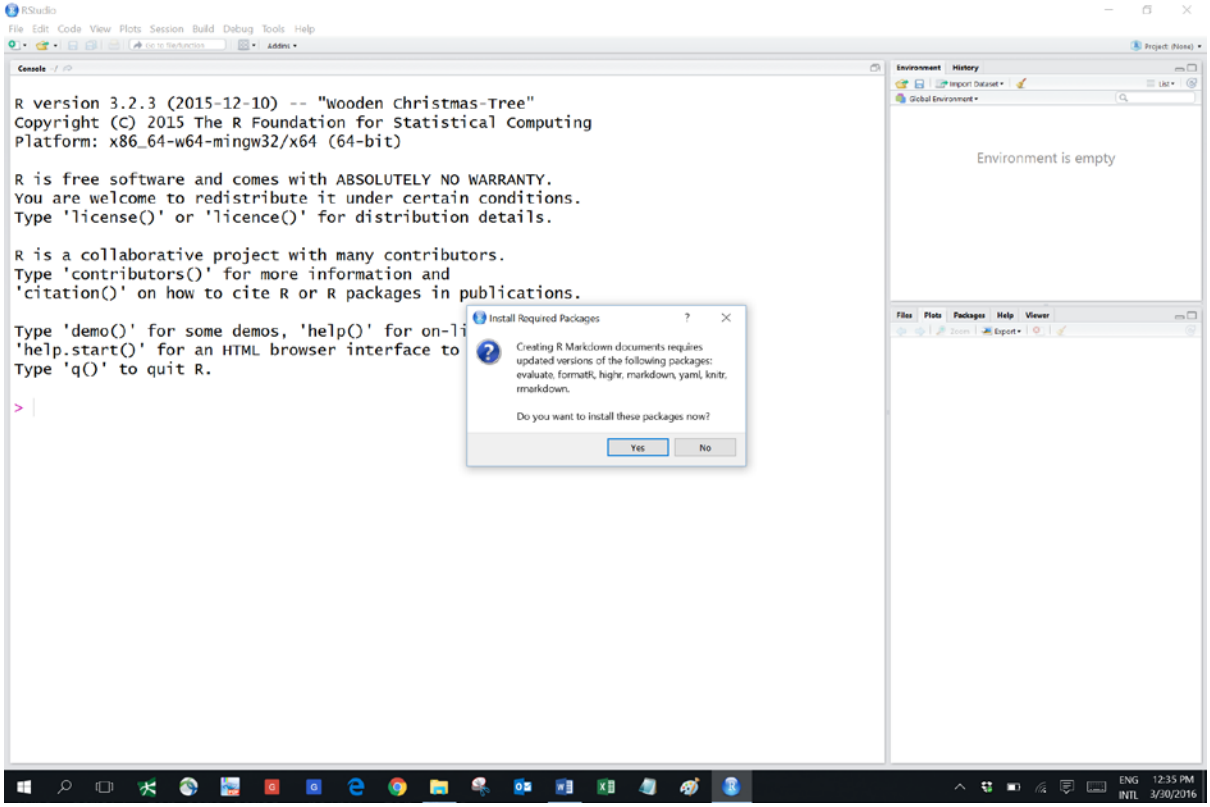
Most Screenshots below are made on a Mac machine. Whenever things are sufficiently different in Windows that it requires extra explanation, Windows screenshots are added. For the installation of Latex/TeX, the installation on Windows is shown in a separate section.



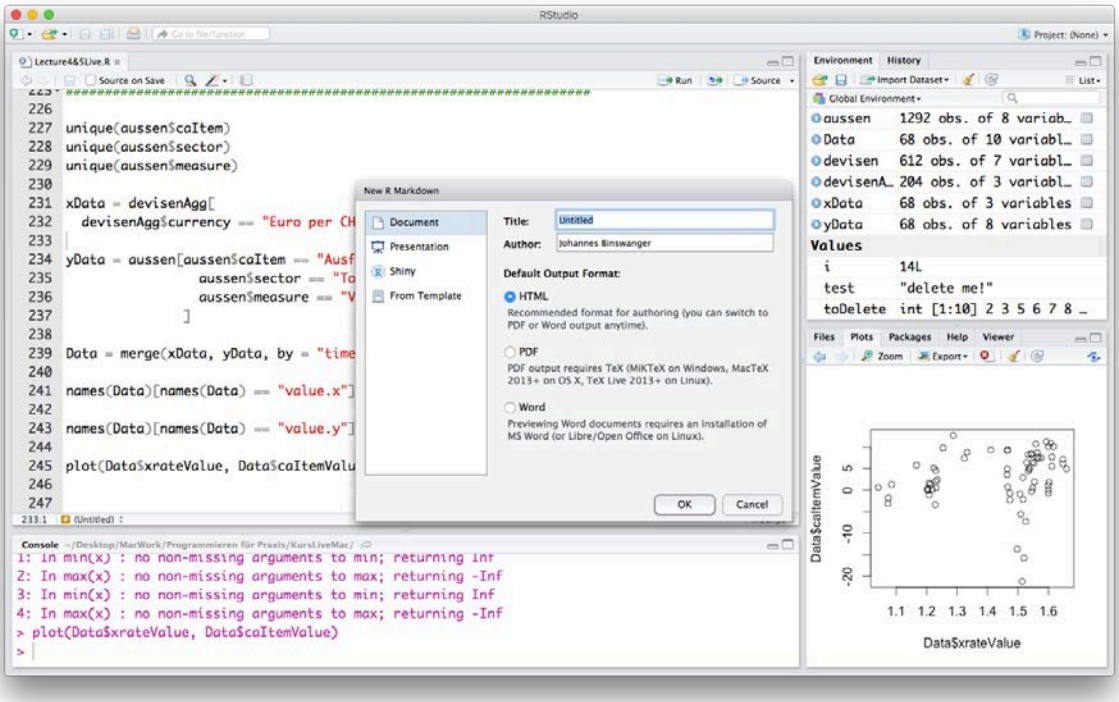
If you click on the R Markdown menu item, you get the following screen. Click Yes.



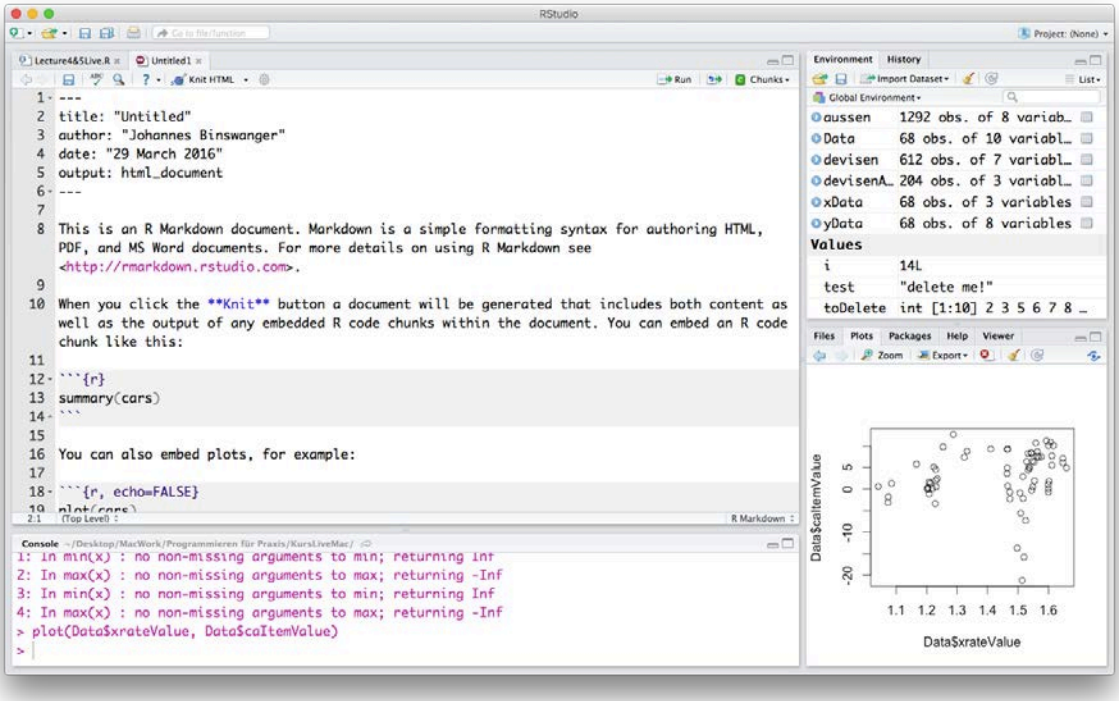
On a Windows 10 machine, you get the following. Click Yes.



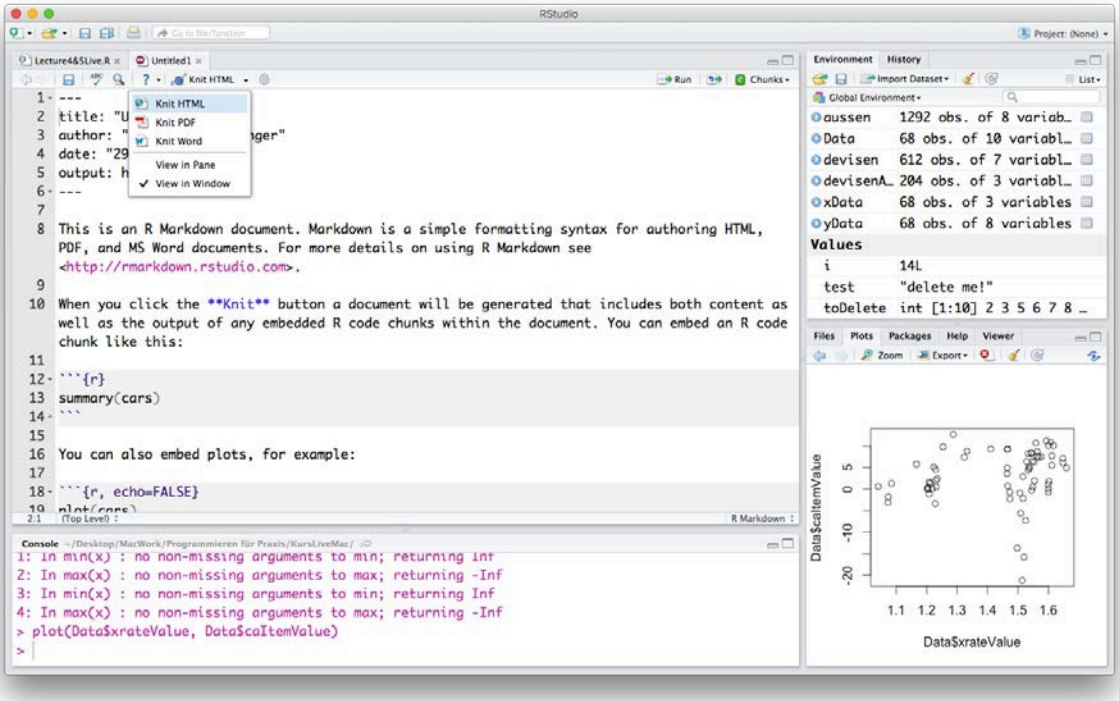
As a result, this installs the `rmarkdown` (and some additional) package(s) of R. Once it is installed, you immediately get the following screen. Choose OK.


RStudio
Lecture4&5Live.R
unique(aussen$caItem)
unique(aussen$sector)
unique(aussen$measure)
xData = devisenAgg[
devisenAgg$currency == "Euro per CH
yData = aussen[aussen$caItem == "Ausf
aussen$sector == "To
aussen$measure == "V
]
Data = merge(xData, yData, by = "time
names(Data)[names(Data) == "value.x"]
names(Data)[names(Data) == "value.y"]
plot(Data$xrateValue, Data$caItemValu
New R Markdown
Document
Presentation
Shiny
From Template
Title:
Untitled
Author:
Johannes Binswanger
Default Output Format:
HTML
Recommended format for authoring (you can switch to PDF or Word output anytime).
PDF
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).
Word
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).
OK
Cancel
Console
1: In min(x) : no non-missing arguments to min; returning Inf
2: In max(x) : no non-missing arguments to max; returning -Inf
3: In min(x) : no non-missing arguments to min; returning Inf
4: In max(x) : no non-missing arguments to max; returning -Inf
> plot(Data$xrateValue, Data$caItemValue)
Environment
History
Global Environment
aussen 1292 obs. of 8 variab…
Data 68 obs. of 10 variabl…
devisen 612 obs. of 7 variabl…
devisenA… 204 obs. of 3 variabl…
xData 68 obs. of 3 variables
yData 68 obs. of 8 variables
Values
i 14L
test "delete me!"
toDelete int [1:10] 2 3 5 6 7 8 …
Files
Plots
Packages
Help
Viewer
Zoom
Export
Data$caItemValue
Data$xrateValue
-20
-10
0
5
1.1
1.2
1.3
1.4
1.5
1.6

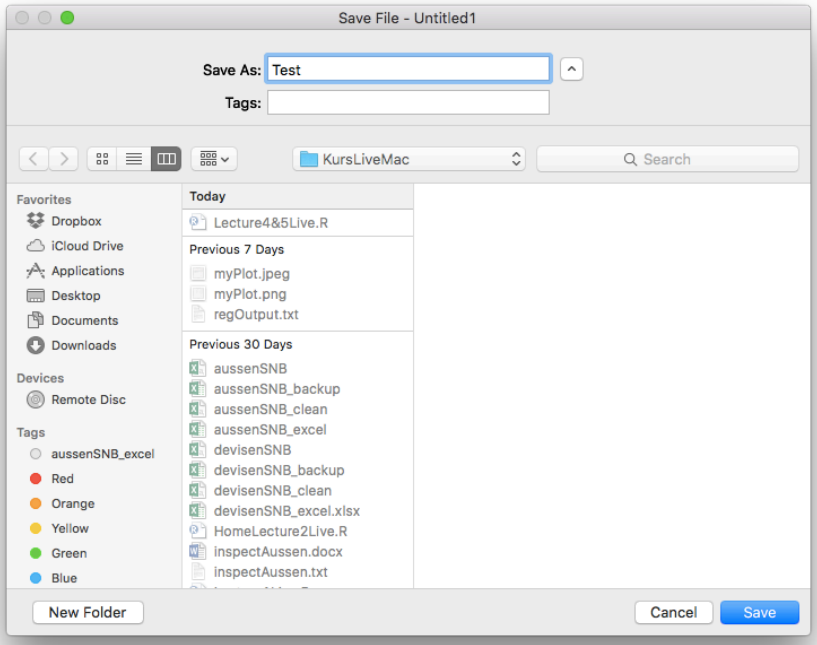
The result is a new document called Untitled 1.



What you see is just the editing interface of a document that you can ultimately compile to a html, pdf or word document. The text in the editor is just an example that is automatically generated by RStudio. Choose “Knit HTML” to get a taste of how this works.

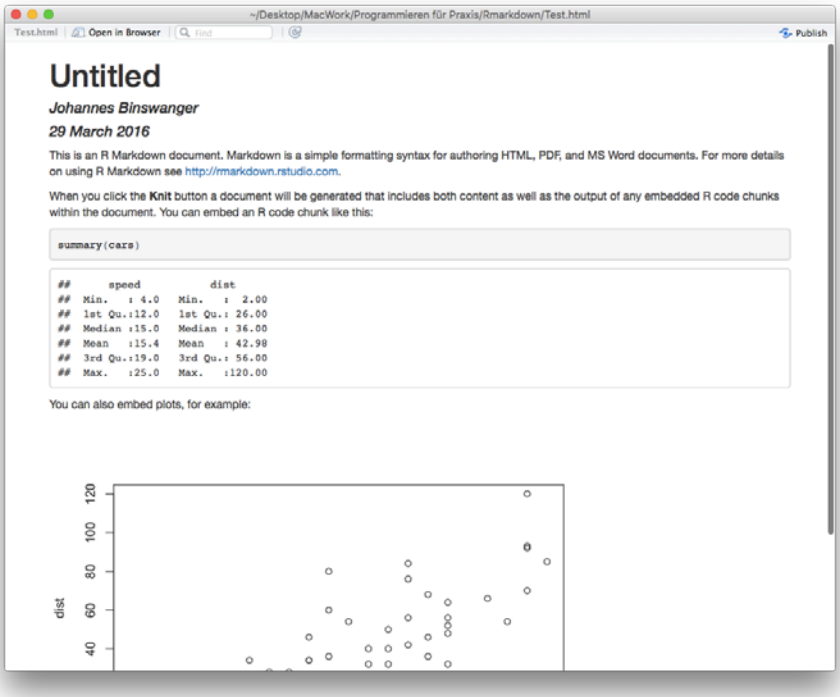


You are asked to give the new document a name, say “Test”.



On a Mac and on Windows 10, the new document is automatically saved with the `Rmd` extension (`.Rmd`). In Windows 7 you sometimes have to add this manually (I am not sure about Windows 8, probably no need for manual adjustments).

The result looks like this (more on it during class). You can actually use this for the documentation of you own results.

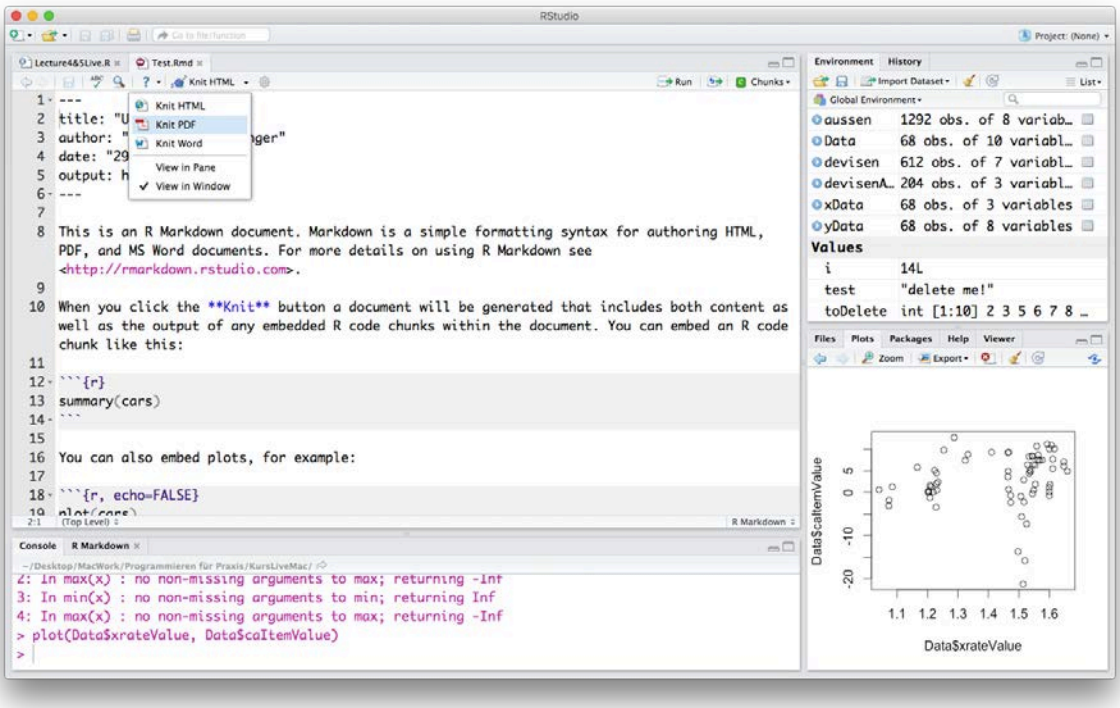


You can also install the `rmarkdown` package in the usual way as we install any other package.

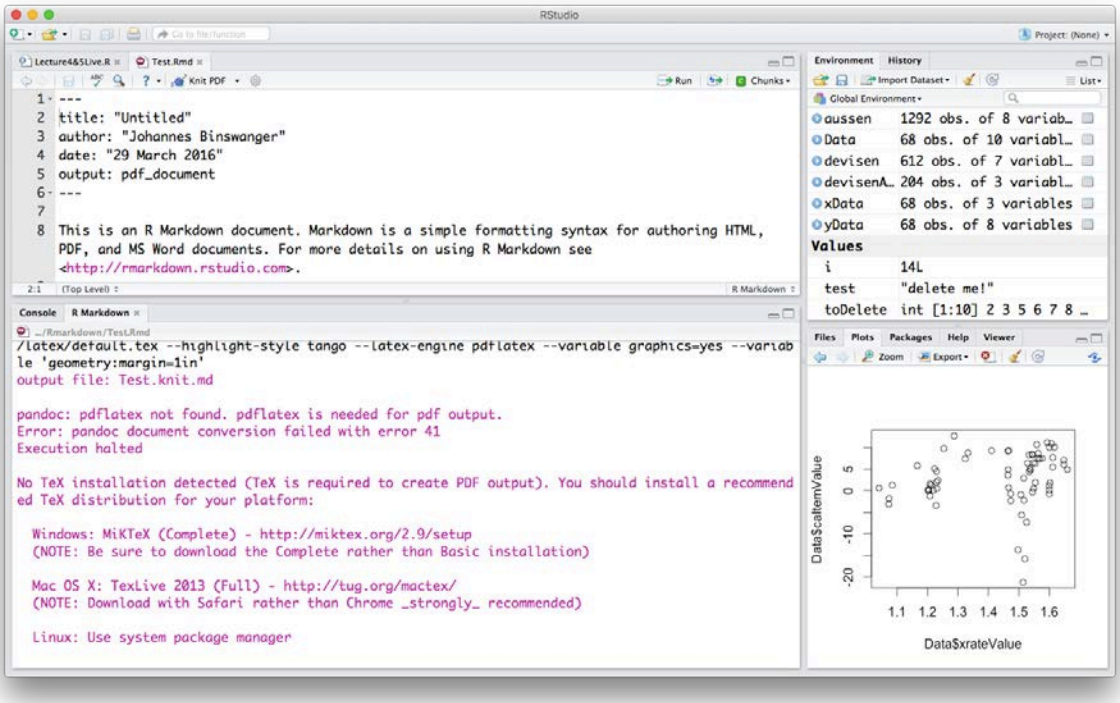
```
install.packages("rmarkdown")
```

Generating pdfs: Installing TeX on a Mac

Suppose now that you choose “knit PDF” instead of “knit HTML”. What happens?

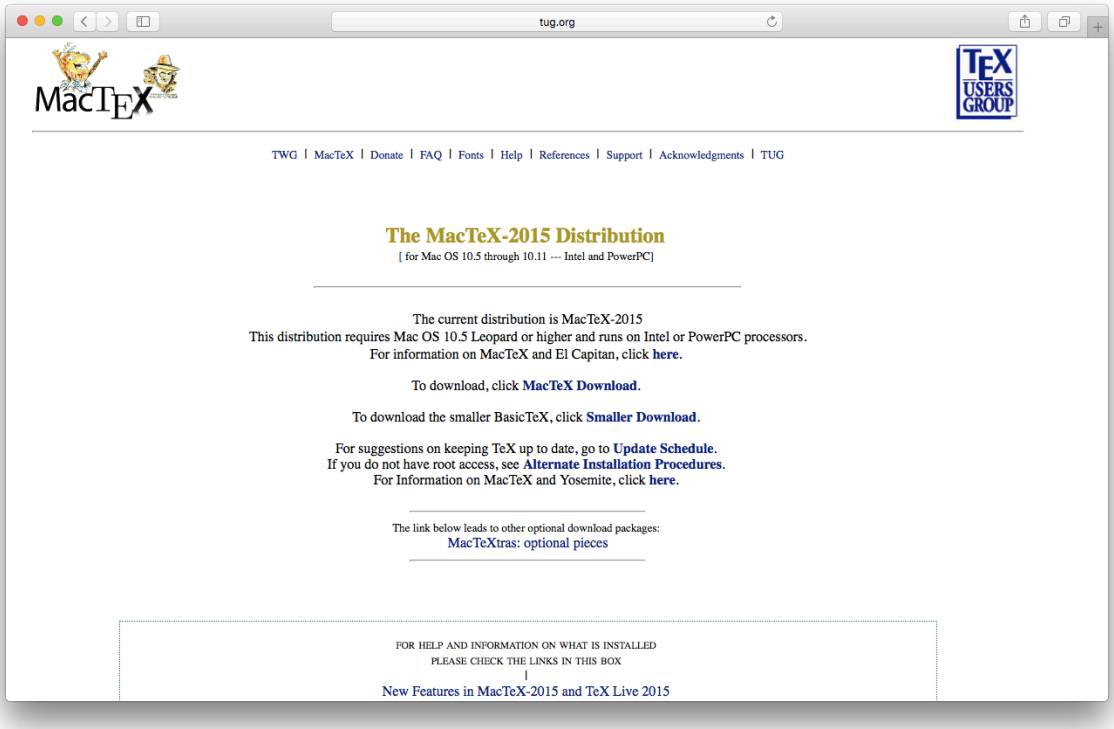


This does not work, since you need an additional program called “Latex” or simply “TeX”. So you just get an error message with some instructions about what to do.

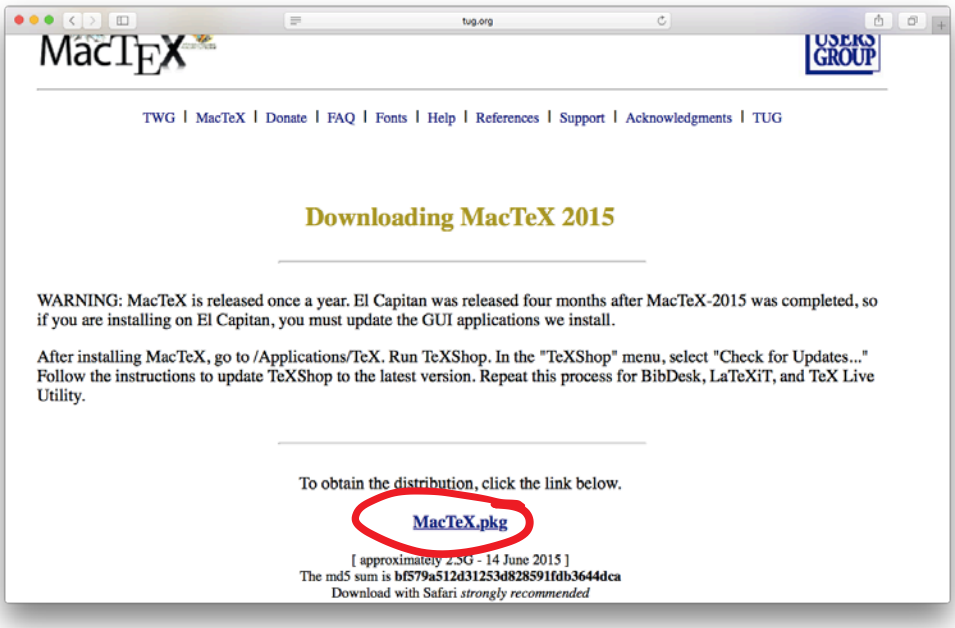


Just follow the instructions. Thus on a Mac, visit http://tug.org/mactex/. Use SAFARI rather than Chrome, as suggested. Before you start with the installation, a warning to those with OS X El Capitan (like me). You will need to go through some extra steps that make you familiar with the inner life of a computer ;-) Don't worry, it's not too bad.

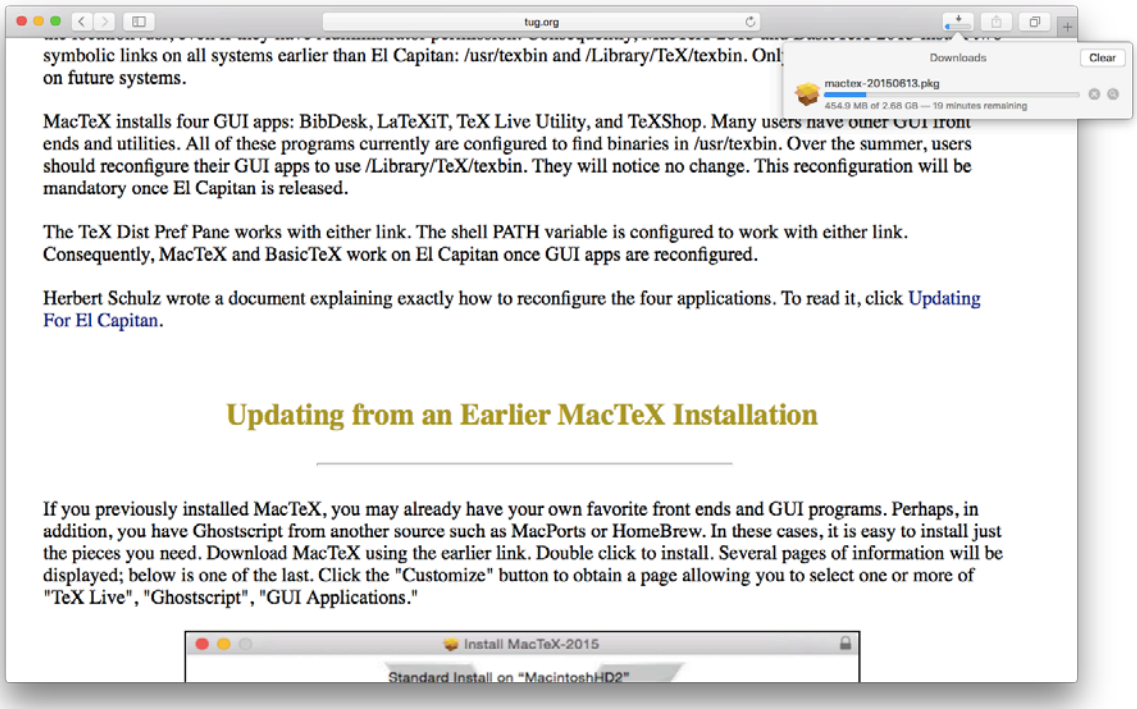
So, let's download TeX. So go to https://tug.org/mactex/ in Safari.



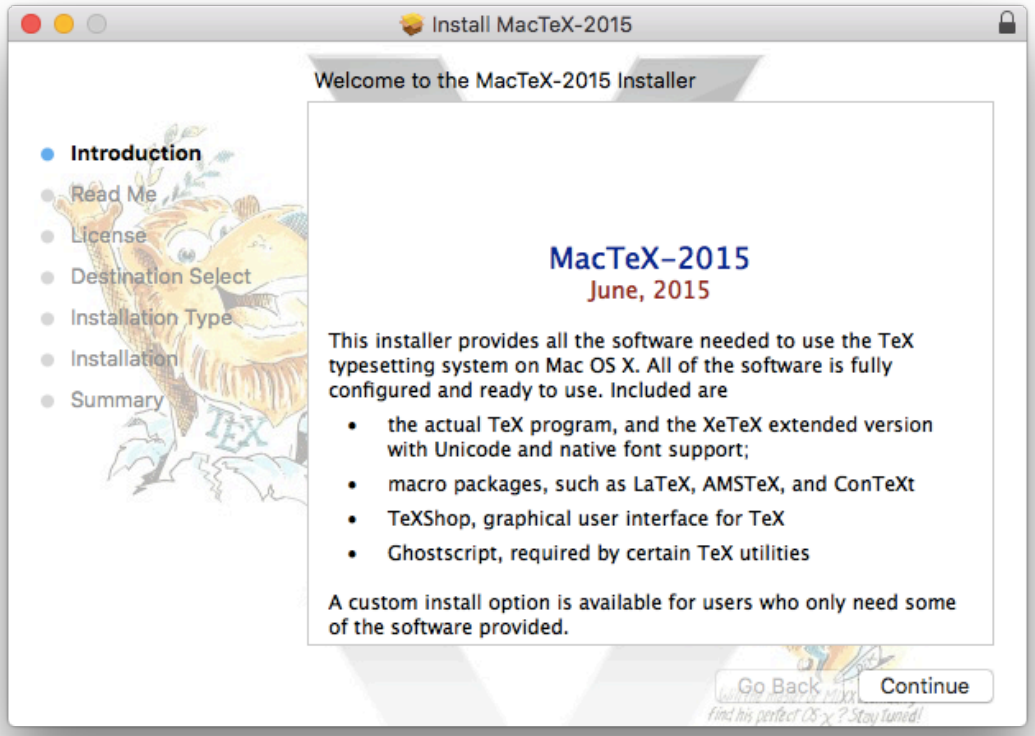
Click on MacTeX Download (do NOT download the smaller version BasicTeX). Then click on MacTeX.pkg on the following screen.

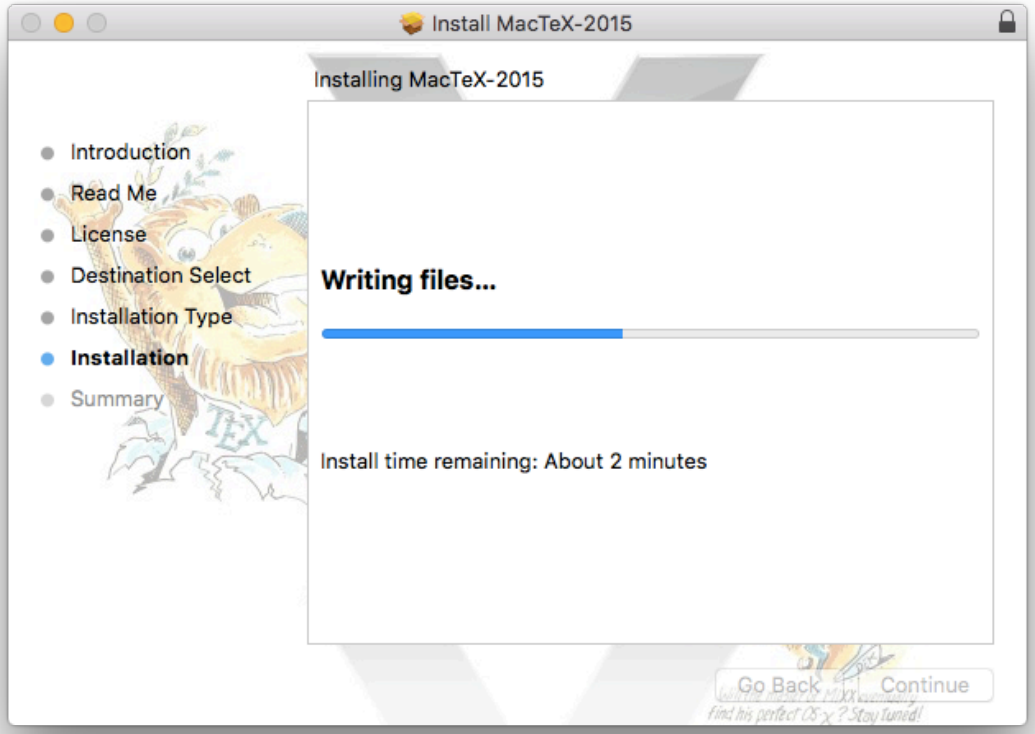


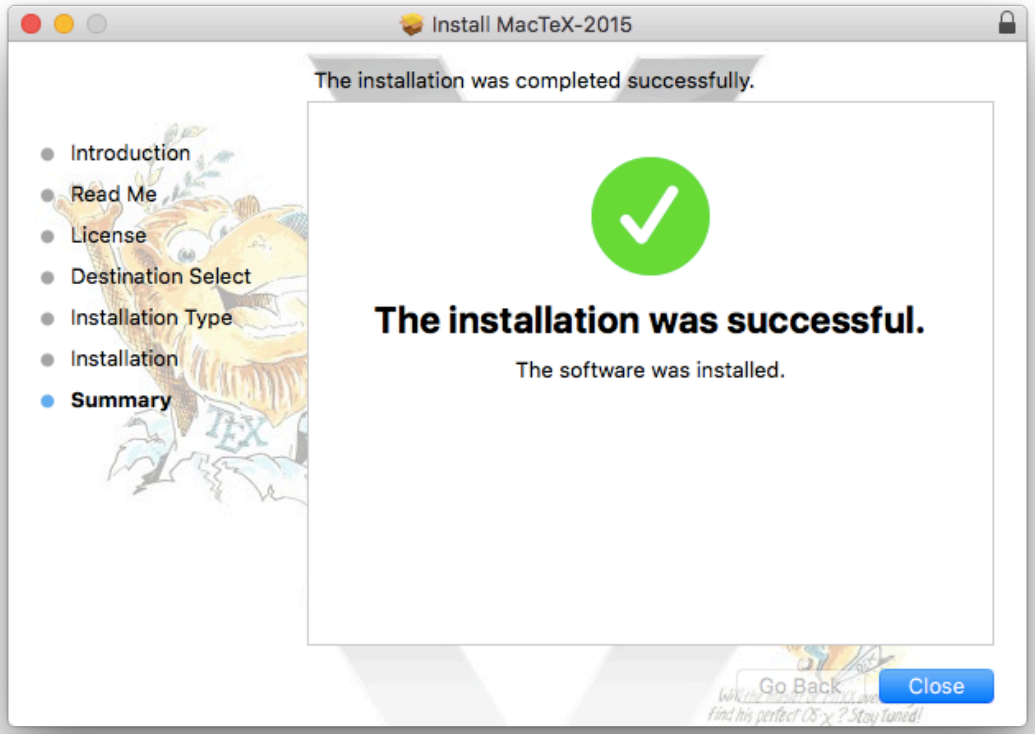
When you do so, the installation files get downloaded to your machine, probably in the Downloads folder. In my case, the download took at least 20 minutes, so don't panic if you do not see much progress. You can actually see the progress by clicking on the little download symbol on the upper right corner (see screen below).



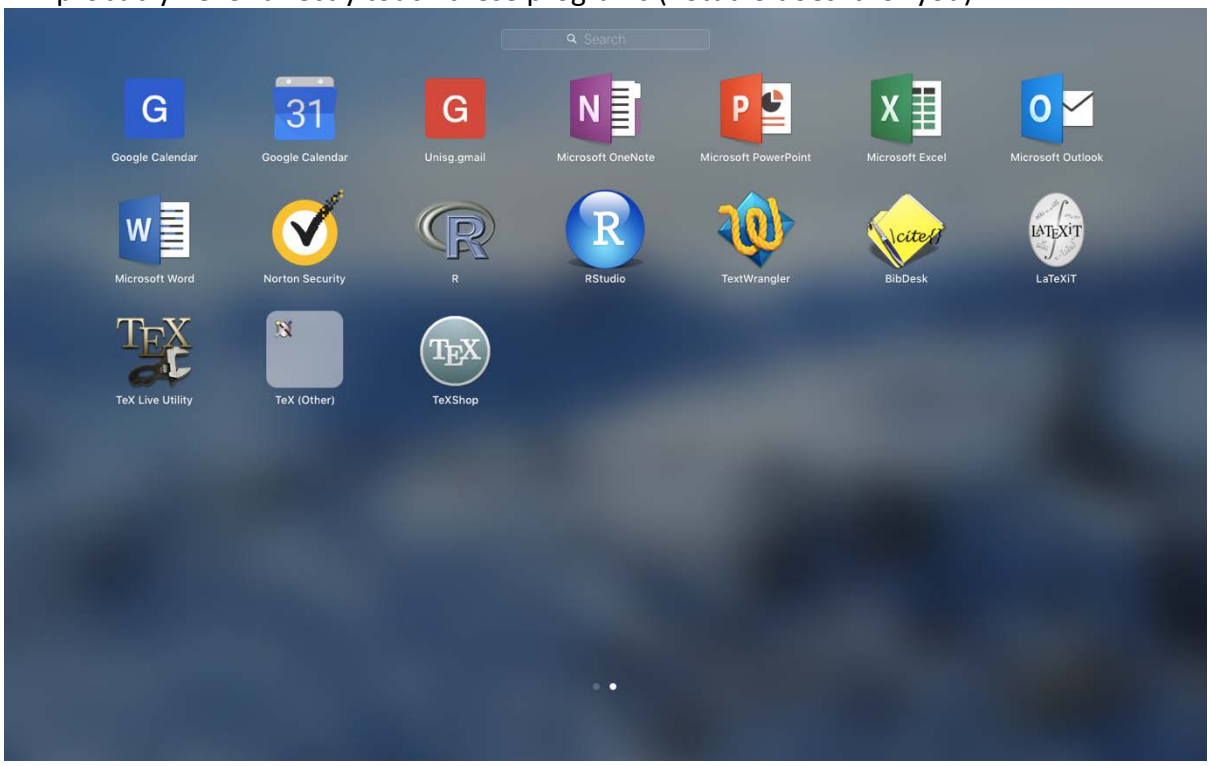
When the download is completed, move the folder you just downloaded to the desktop and double click. Everything gets installed nicely with the usual steps. See some screenshots are shown below (not complete, some screens are missing).



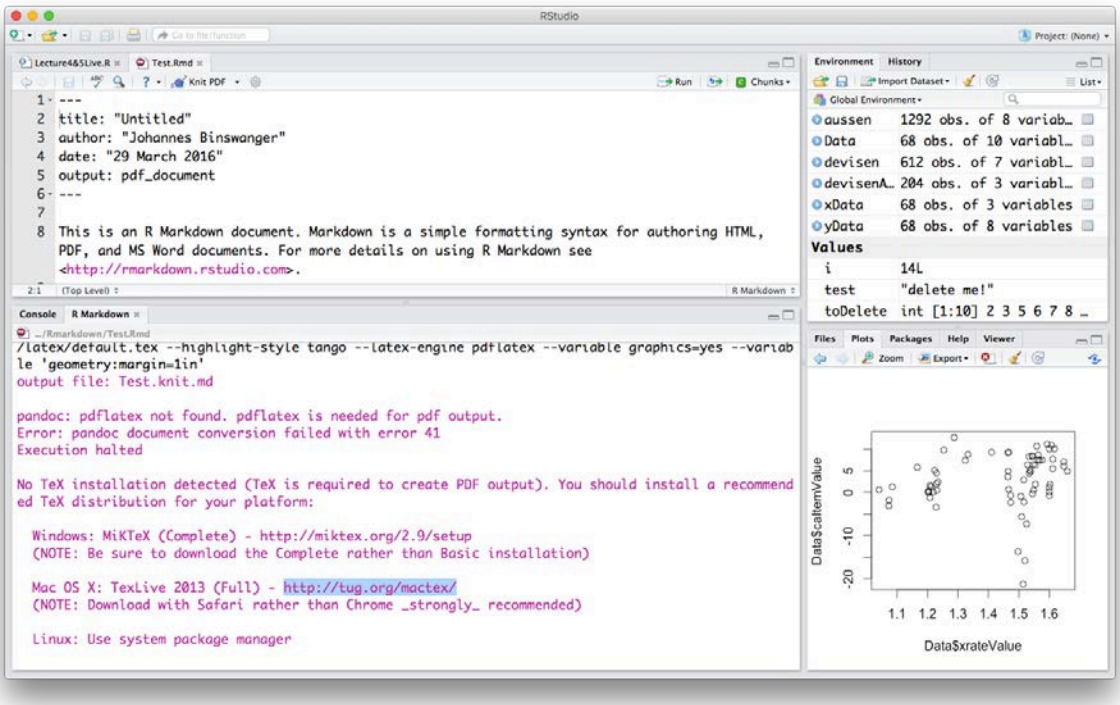

Install MacTeX-2015
Installing MacTeX-2015
Introduction
Read Me
License
Destination Select
Installation Type
Installation
Summary
Writing files...
Install time remaining: About 2 minutes
Go Back
Continue


Install MacTeX-2015
The installation was completed successfully.
Introduction
Read Me
License
Destination Select
Installation Type
Installation
Summary
The installation was successful.
The software was installed.
Go Back
Close

When you go to the Launchpad, you can see the new items that were installed: BibDesk, LaTeXiT, TeX Live Utility, Tex (Other), and TeXShop. Except if you have OS X El Capitan, you will probably never directly touch these programs (RStudio does it for you).

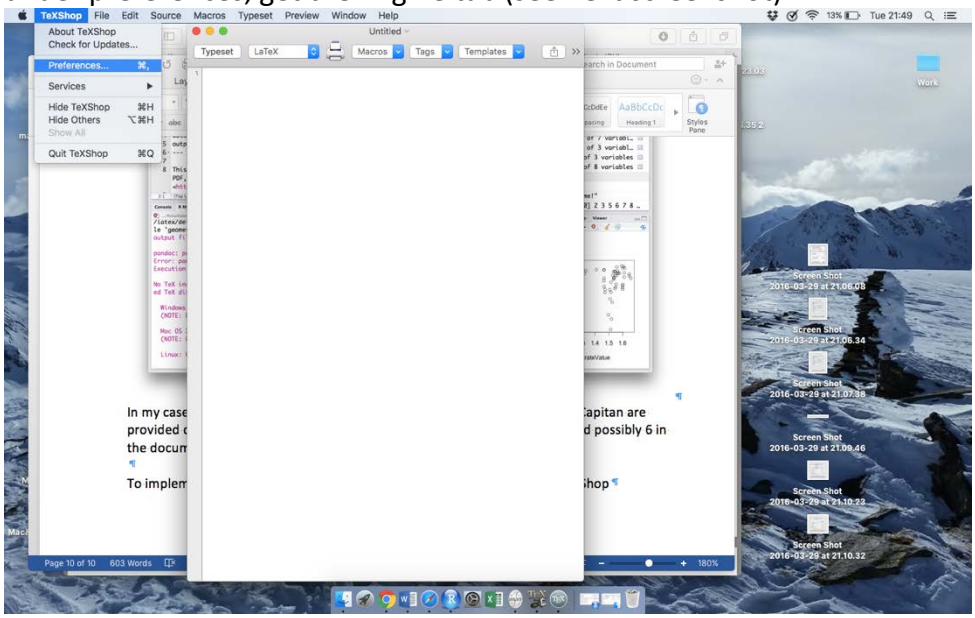


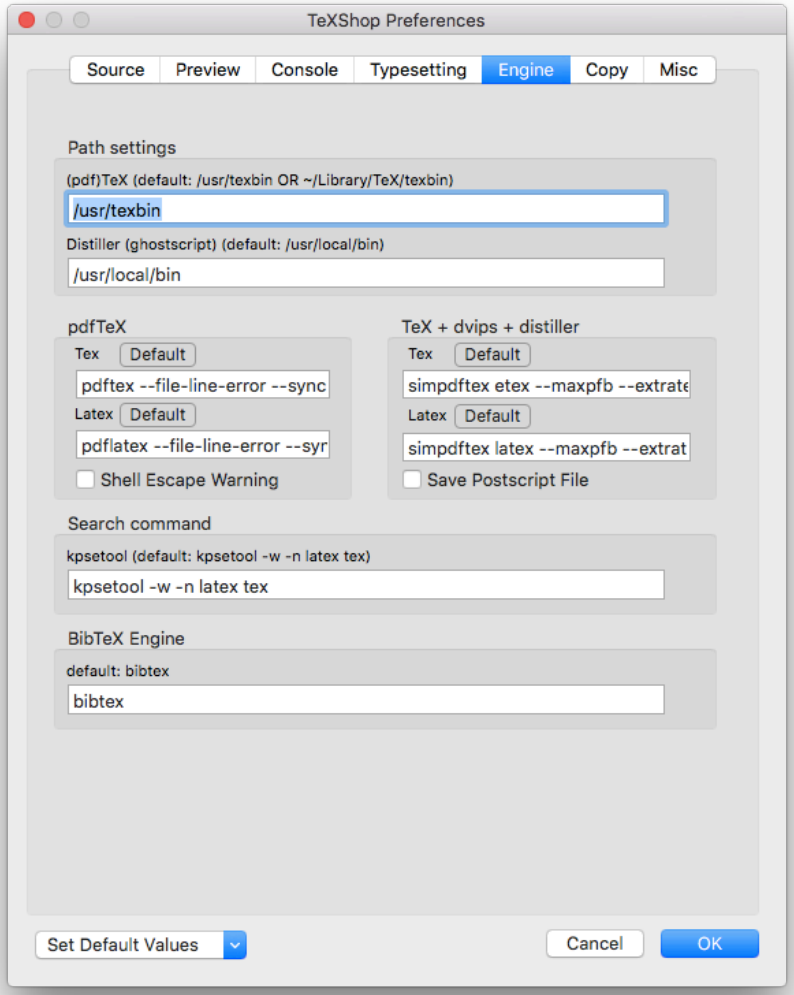
So if you do not have El Capitan, this is probably all you have to do (I cannot check, unfortunately, since I do have El Capitan). You can check by going back to RStudio and select "Knit PDF" from the drop-down menu associated with the file Text.Rmd (see screen below).



In my case, it does not work yet. The instructions on how to proceed with El Capitan are provided on https://tug.org/mactex/UpdatingForElCapitan.pdf. Steps 3, 4, and possibly 6 in this document are important. You can (most likely) ignore the rest.

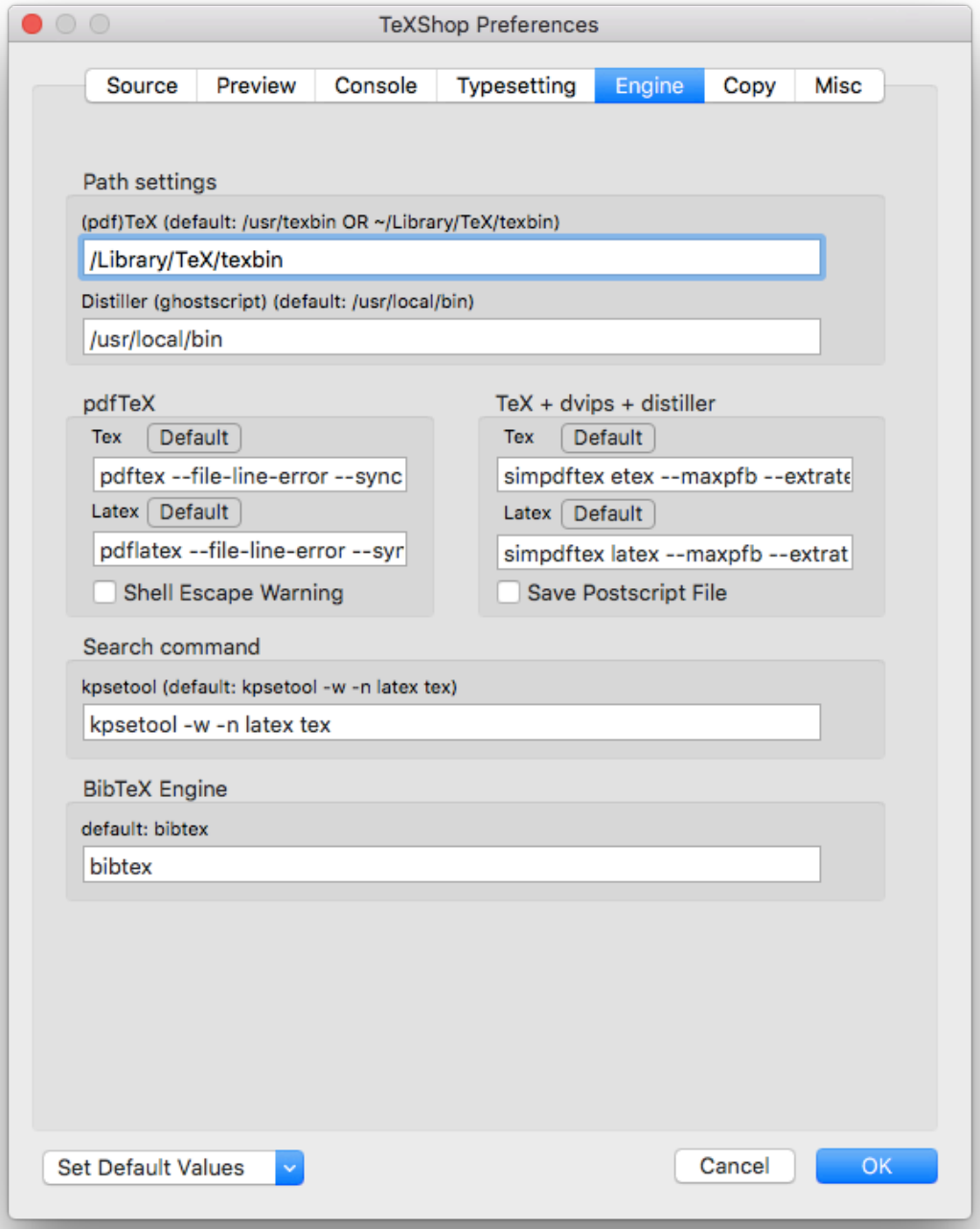
To implement step 3, go to the Launchpad and open TeXShop. From the TeXShop menu, under preferences, get the Engine tab (see next screenshot)





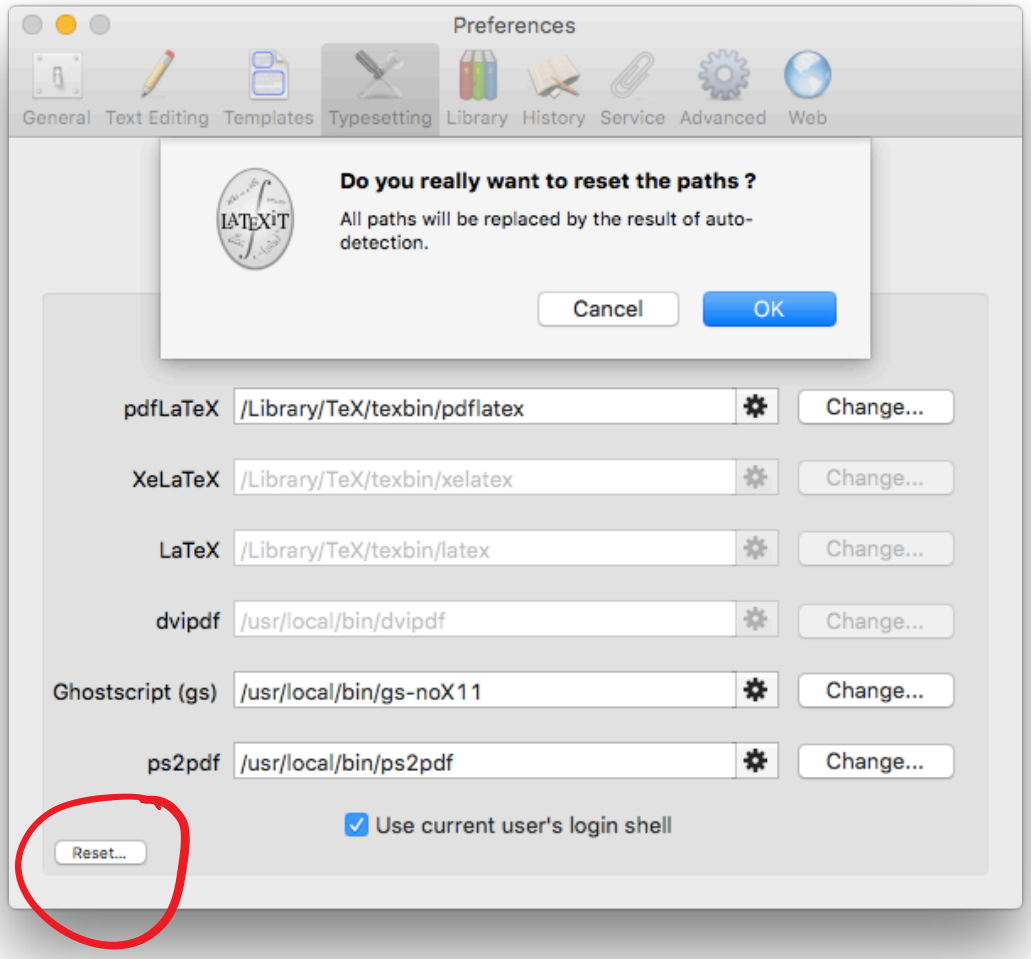
In the first field, delete /usr/textbin and insert /Library/TeX/textbin instead, exactly as shown. Be careful: This is all case-sensitive! Do not touch any other field.

After the change, it looks like this.



Next, open LaTeXiT from the Launchpad. Similarly as in the case before, go to the LaTeXiT menu (next to the apple symbol of your mac), and go again to Preferences. Click on the small “Reset…” button that you see on the screen below.

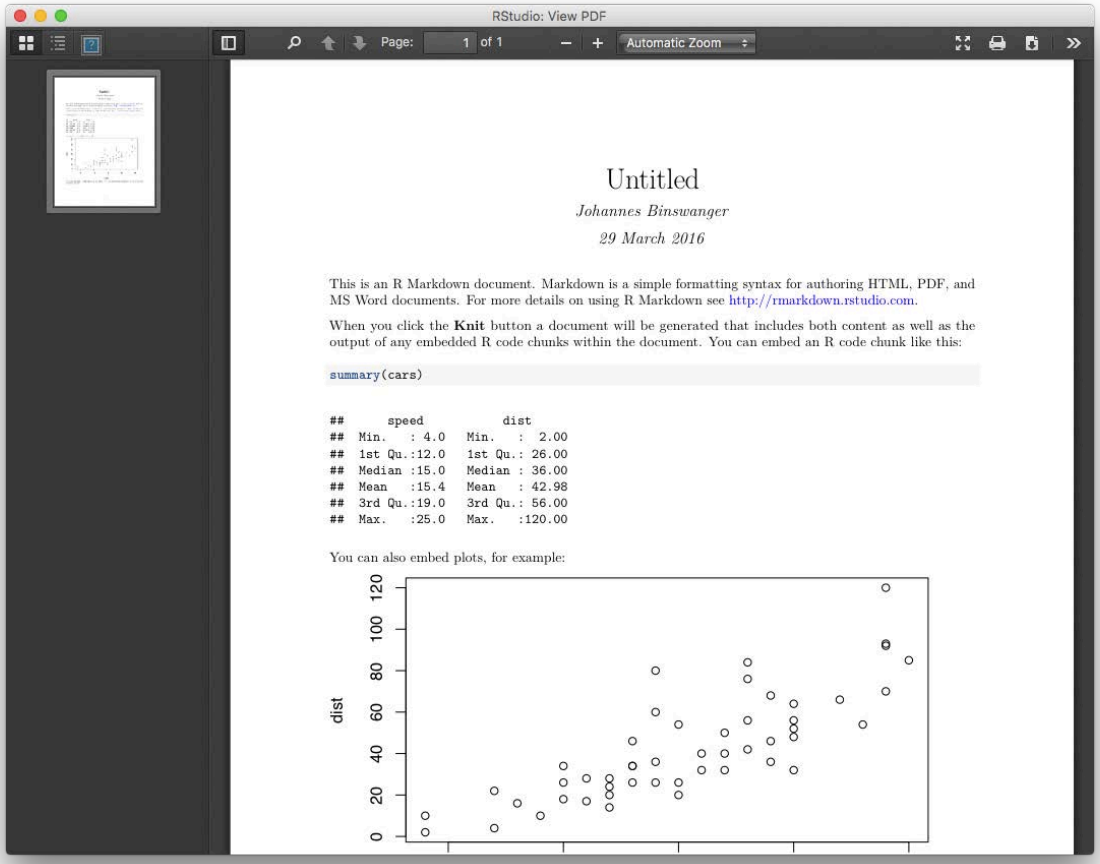
Hitting the reset button changes the first field as shown on the below screen.



When you are asked whether you really want to reset, check OK.

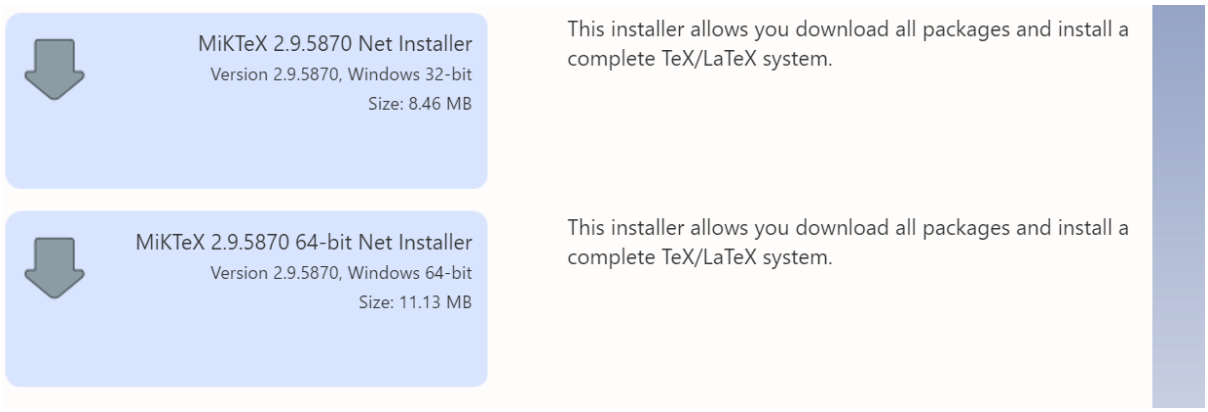
Most likely, you can skip step 6 in https://tug.org/mactex/UpdatingForElCapitan.pdf.

When you have done all this (i.e. only if you have OS X El Capitan anyway), then restart your computer. Open RStudio and the RMarkdown document to be compiled (Test.Rmd in my case). Now hit “Knit PDF” (as shown on screens above). It runs nicely. You see the result on the below screen.

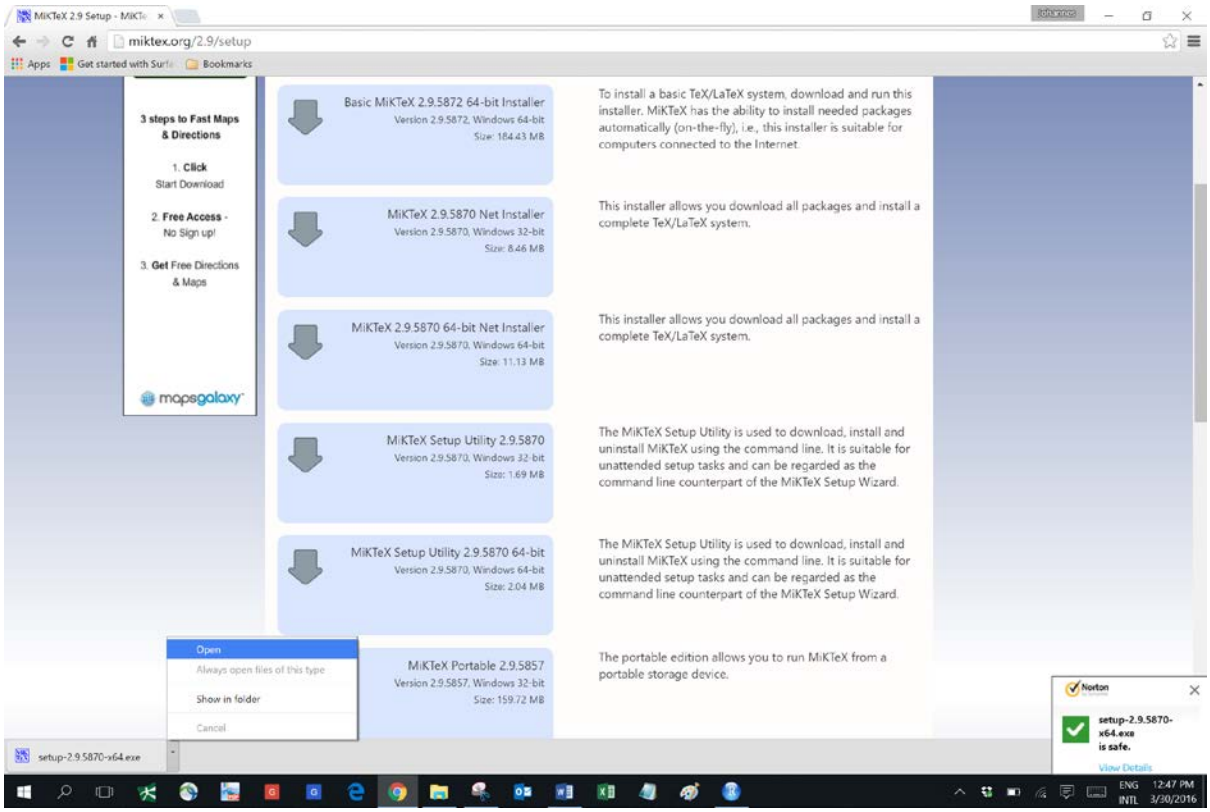

RStudio: View PDF
Page: 1 of 1
Automatic Zoom
Untitled
Johannes Binswanger
29 March 2016
This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.
When you click the Knit button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:
summary(cars)
speed dist
Min. : 4.0 Min. : 2.00
1st Qu.:12.0 1st Qu.: 26.00
Median :15.0 Median : 36.00
Mean :15.4 Mean : 42.98
3rd Qu.:19.0 3rd Qu.: 56.00
Max. :25.0 Max. :120.00
You can also embed plots, for example:
dist
0
20
40
60
80
100
120

Generating pdfs: Installing TeX on Windows

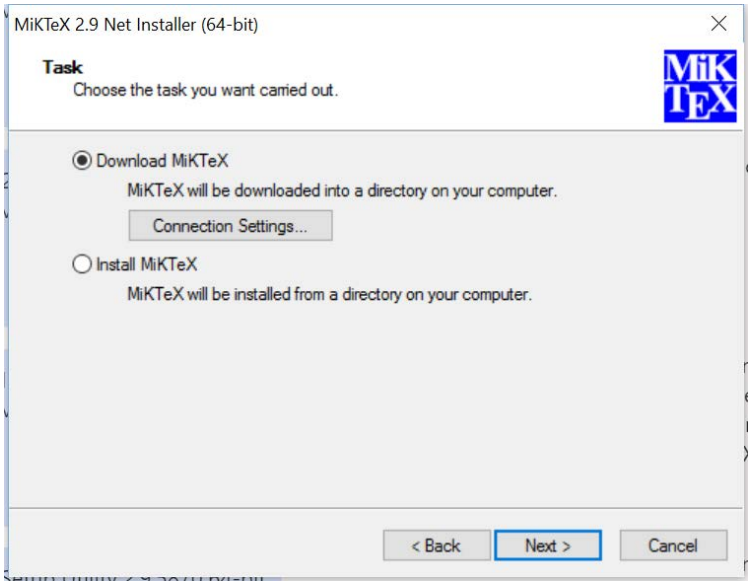
To install TeX on Windows, go to http://miktex.org/2.9/setup. Do NOT chose the Basic Version but one of the two version on the screenshot below, depending on your system (if you do not know which system you have, google it how to find out).



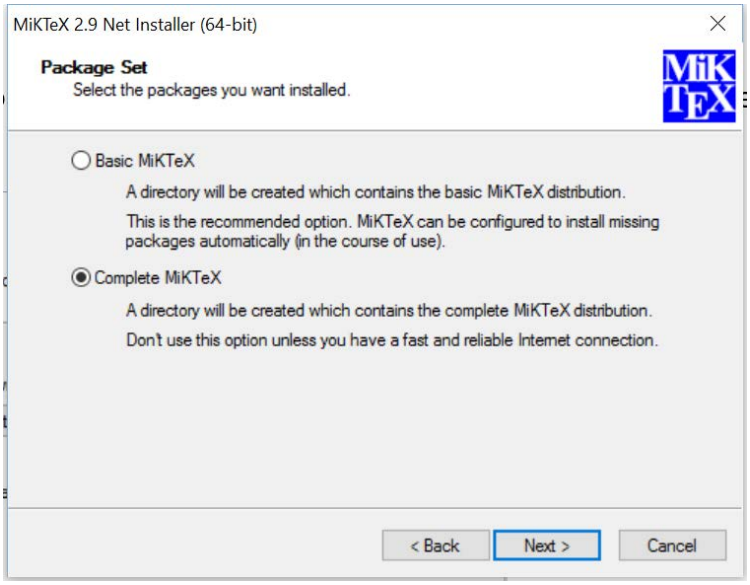
The executable file for the download is visible in the lower left corner. Open it.



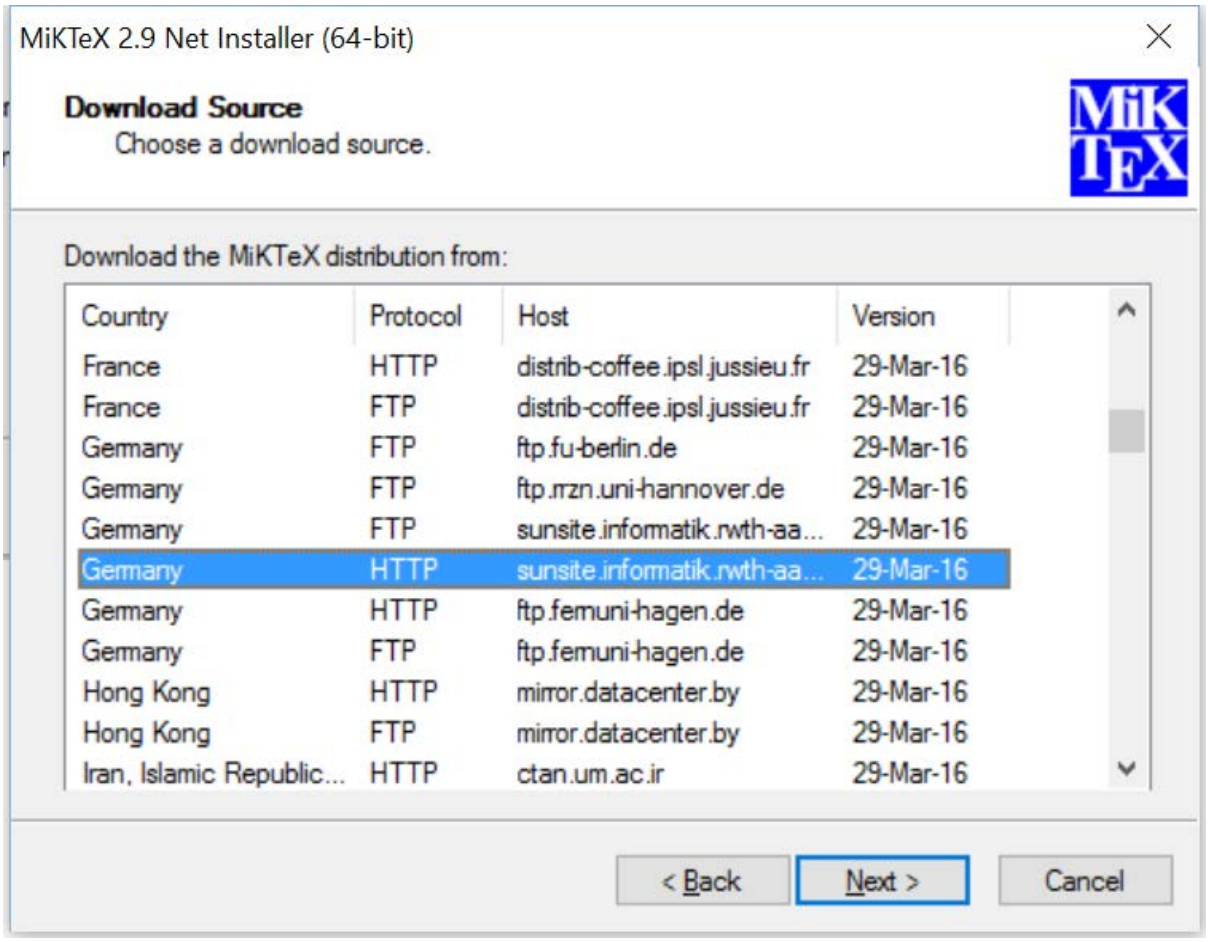
The download procedure then starts (indeed, so far, it's about *downloading* all the files of the MiKTeX distribution, there are many of them, as you will see below; installation comes later). After a few obvious steps, make the choice as shown below:



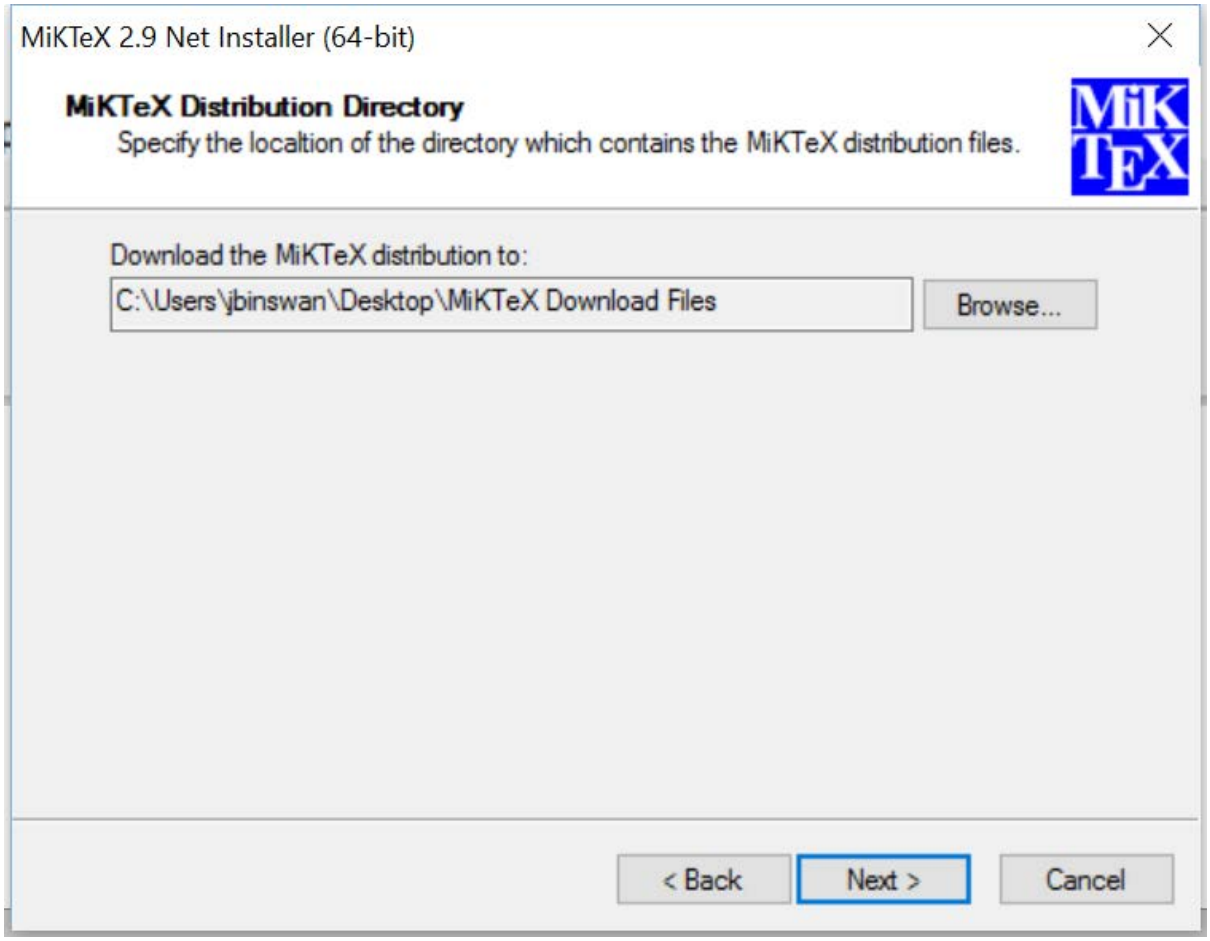
Install the complete version



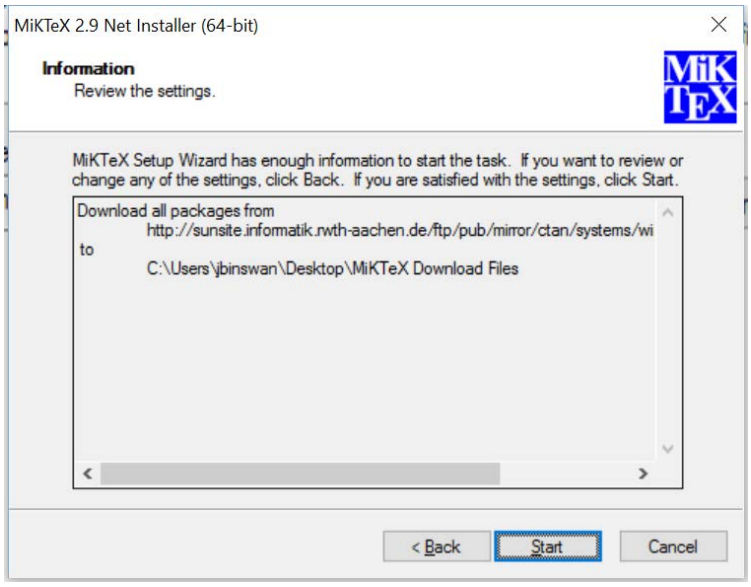
Choose a download source that is close by:



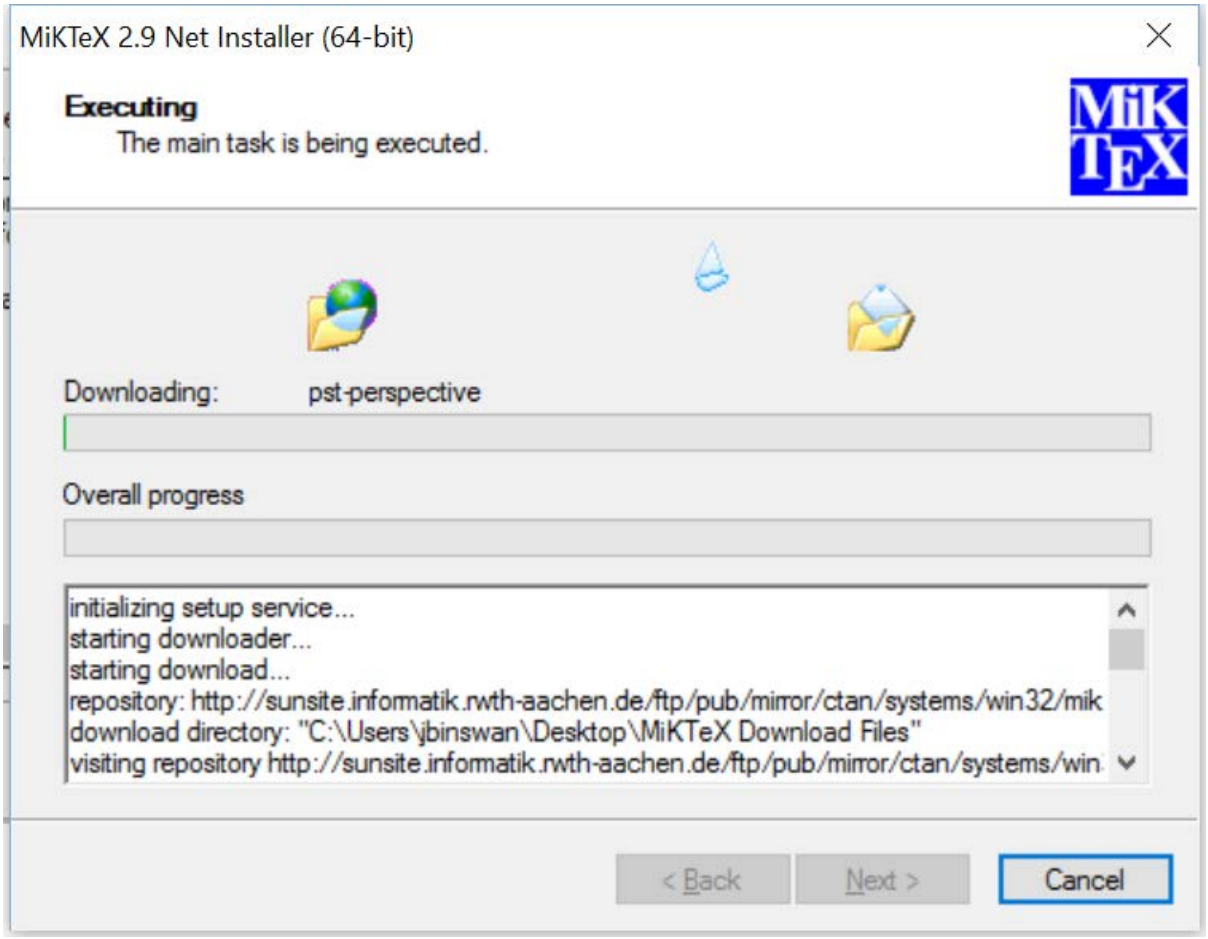
Accept the default directory



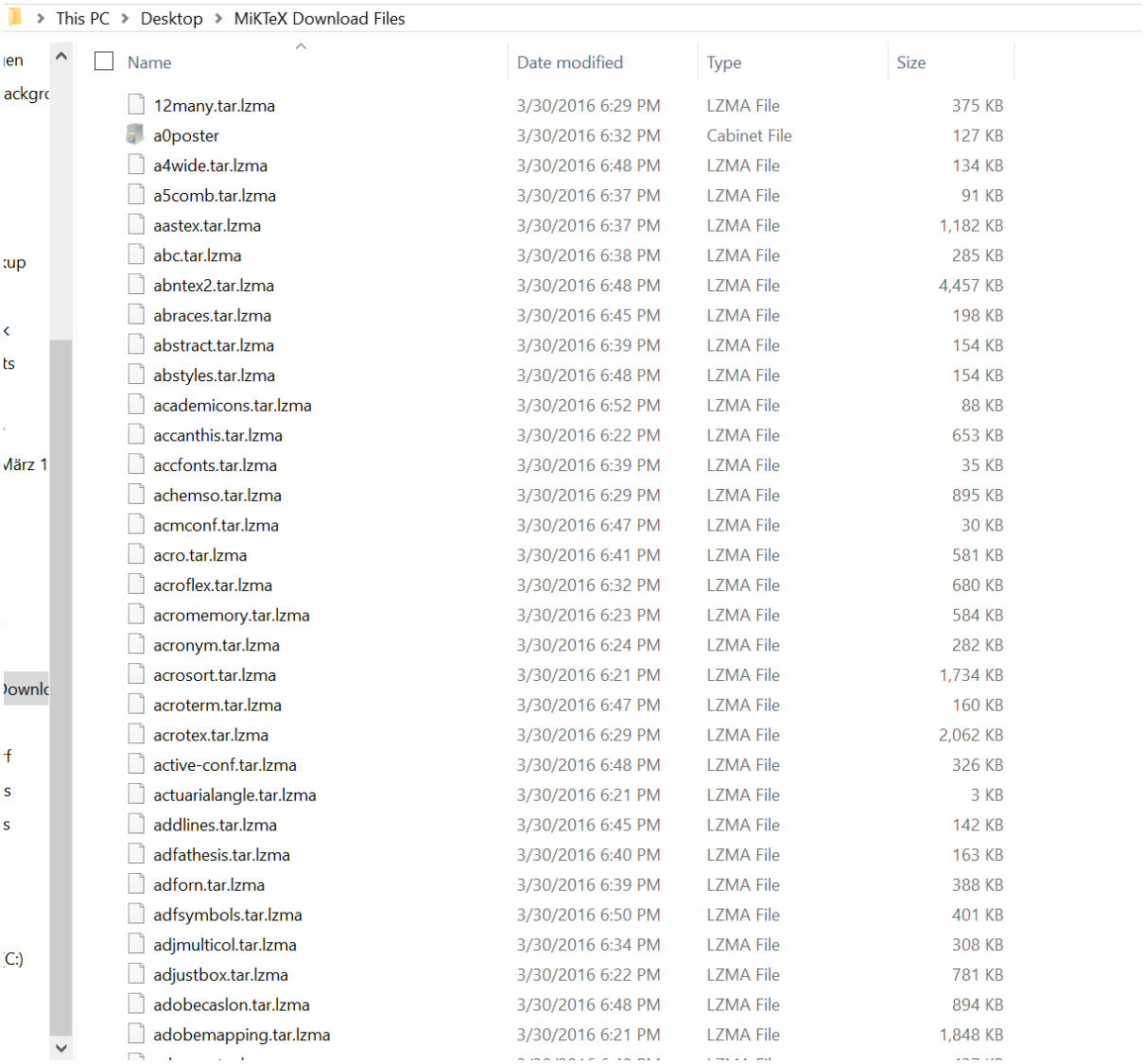
And start the downloading process.



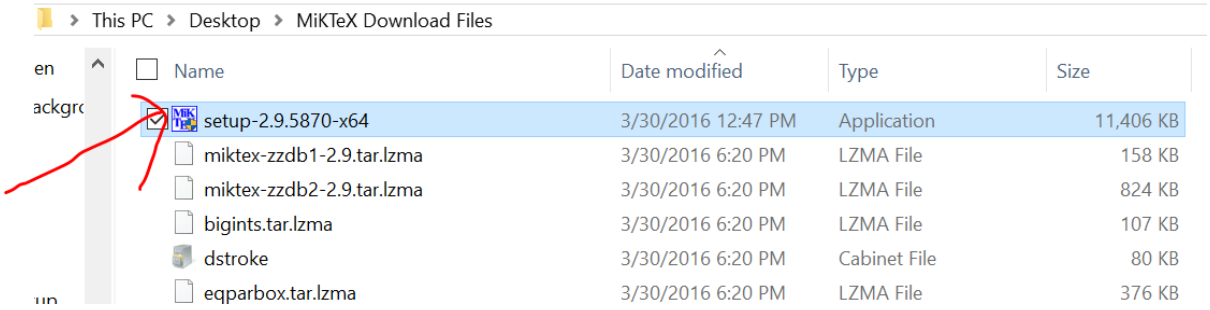
Be prepared, it takes at least about 20 minutes even with a fast connection.



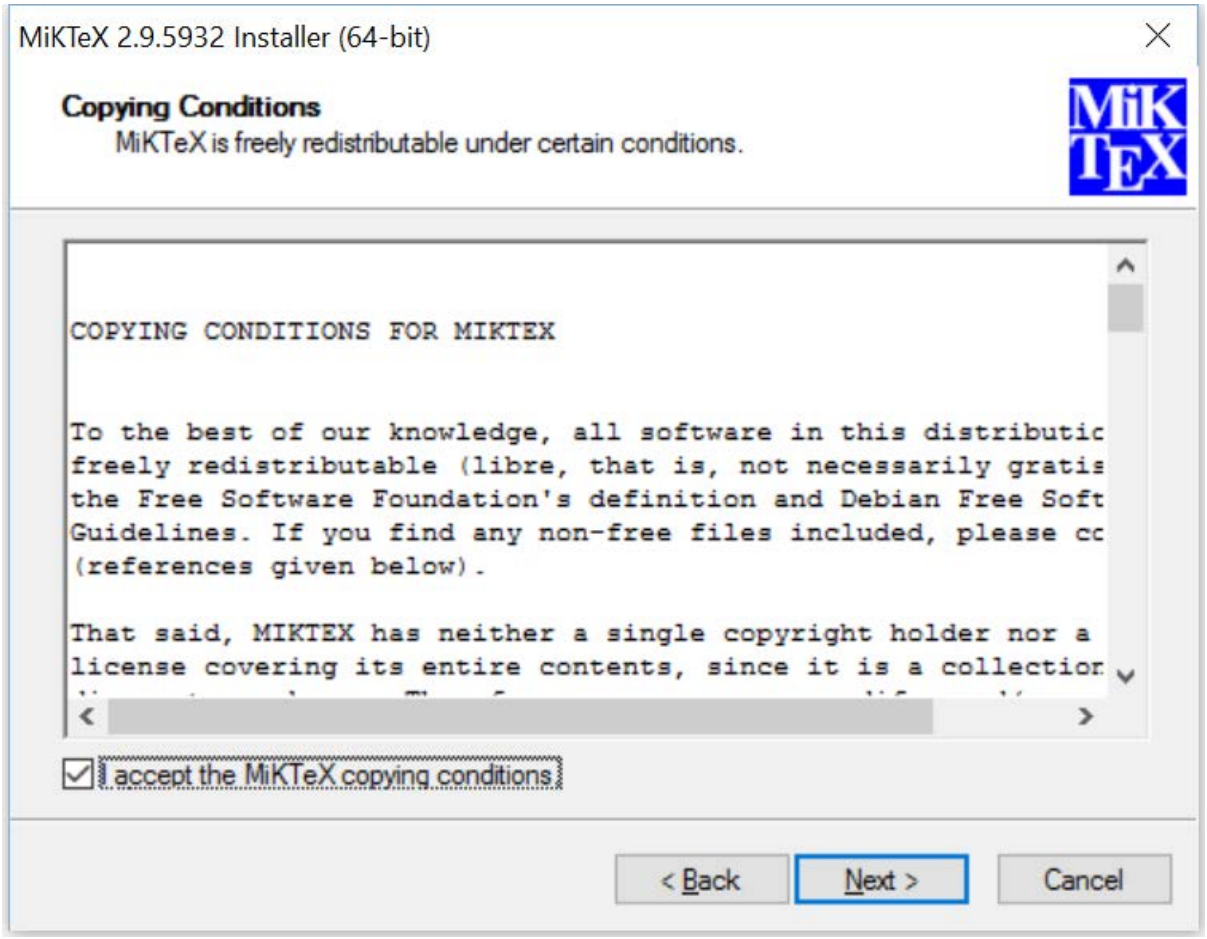
After 20 minutes or so, the download is finished. You have to go through a few prompts that are obvious. Finally, the result is a folder that contains (almost) a thousand files, like on the screen below.



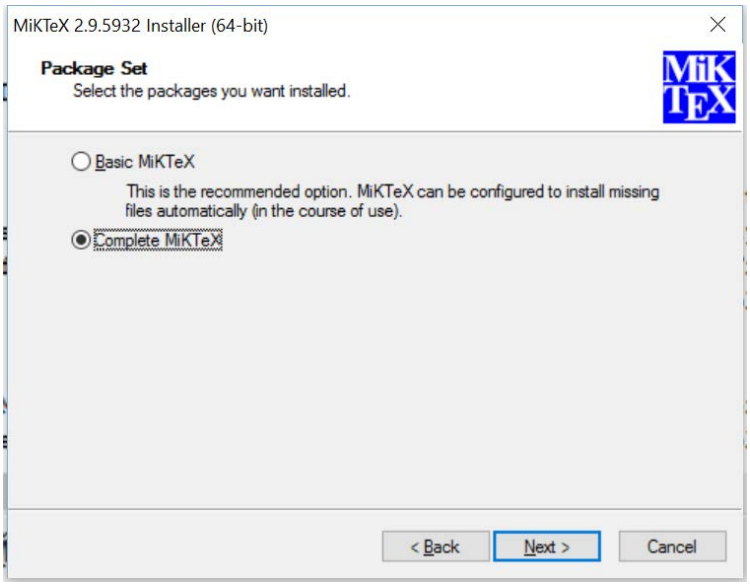
Identify the setup file, as shown below. If you order the files according to Date modified, it's probably the first one (but no guarantees).



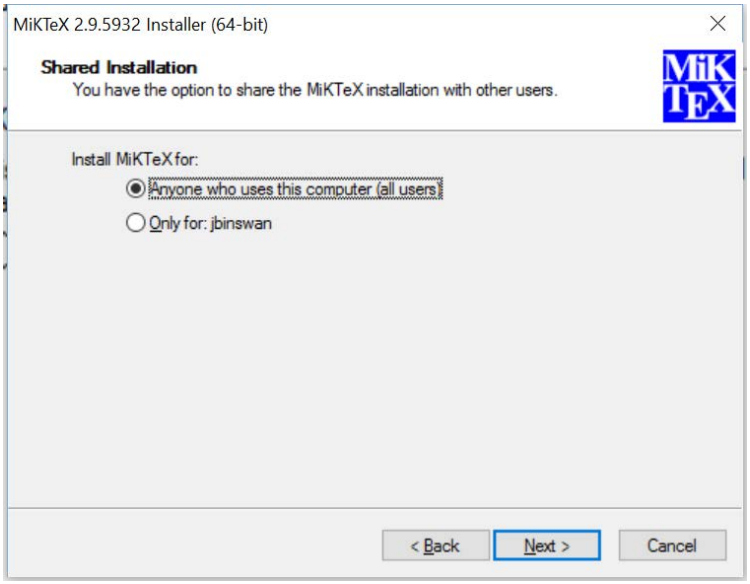
Double-click on it. Allow the program to make changes to your computer, when prompted. You get through a few screens that look very similar as during download, like the one below.



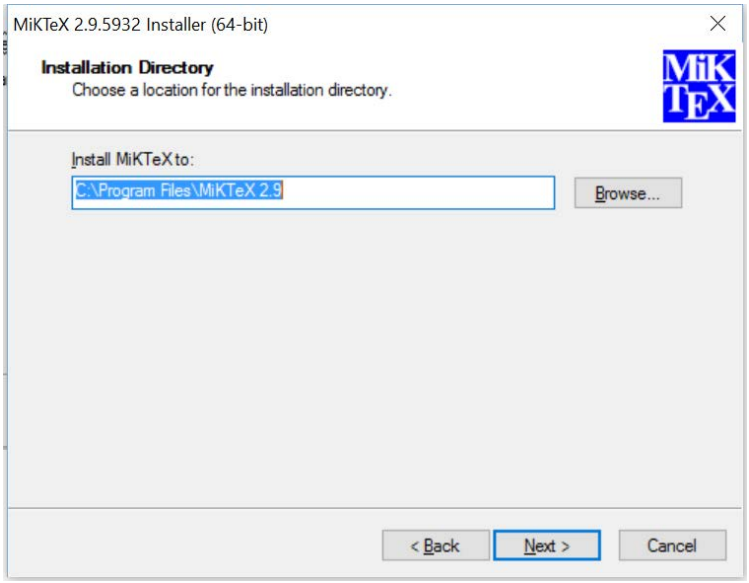
Choose again the complete installation.



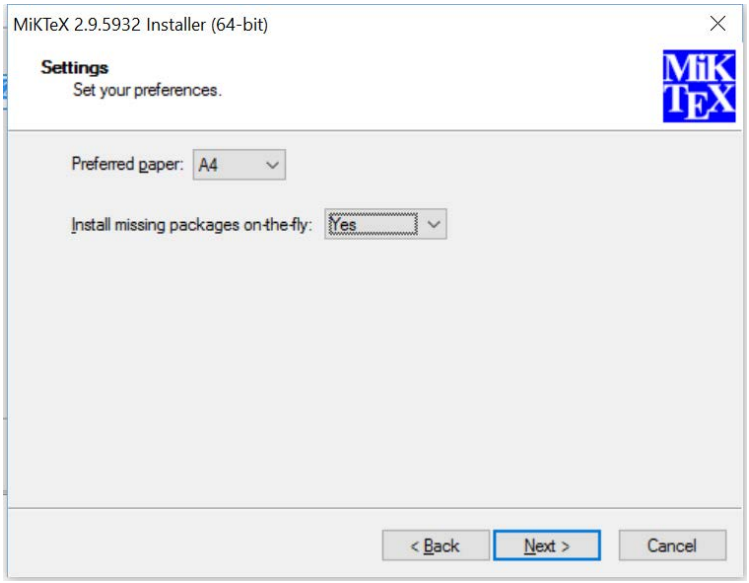
Here is something new. Choose whatever you want.



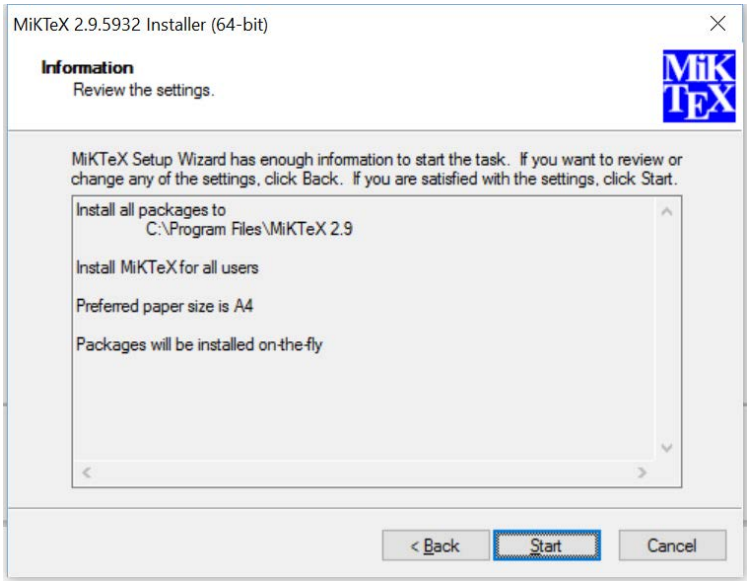
It makes sense to accept the default directory



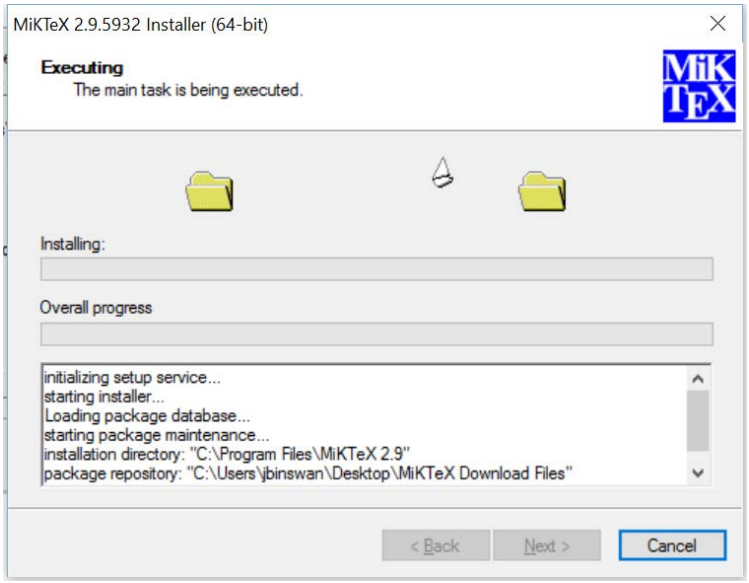
Choose whatever paper you like, and Yes for the second option.



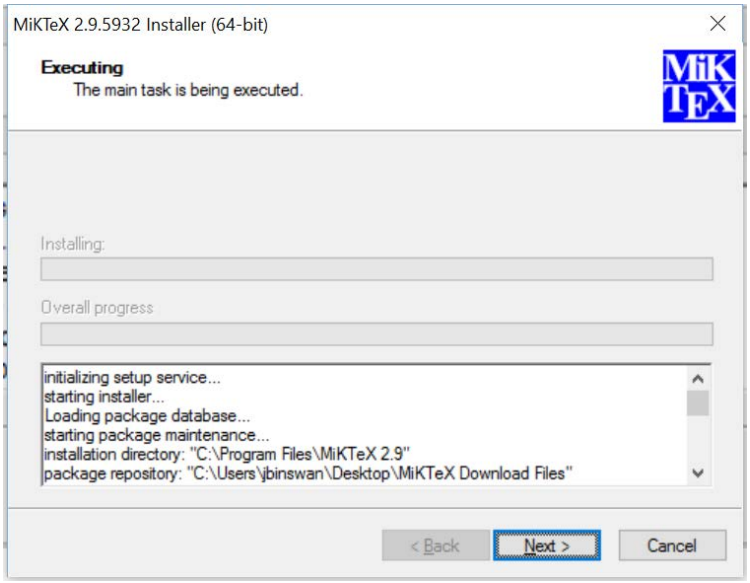
Everything looks good to go.

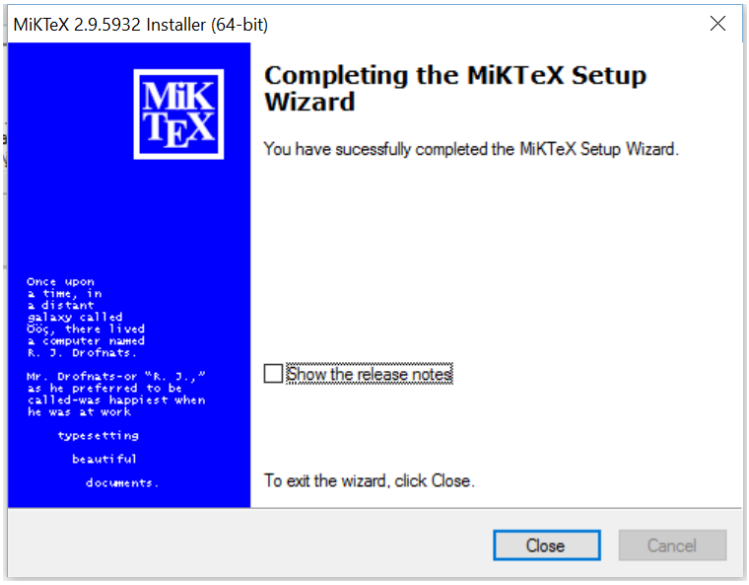


The proper installation is now running.

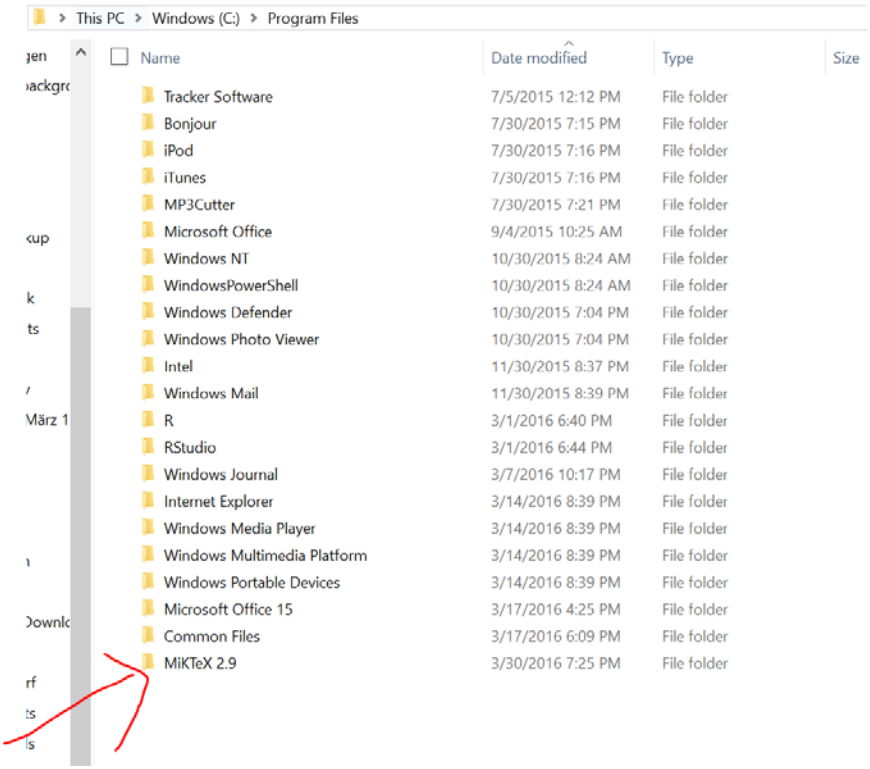


This may take again about 20 minutes or so. Finally, it looks like completed



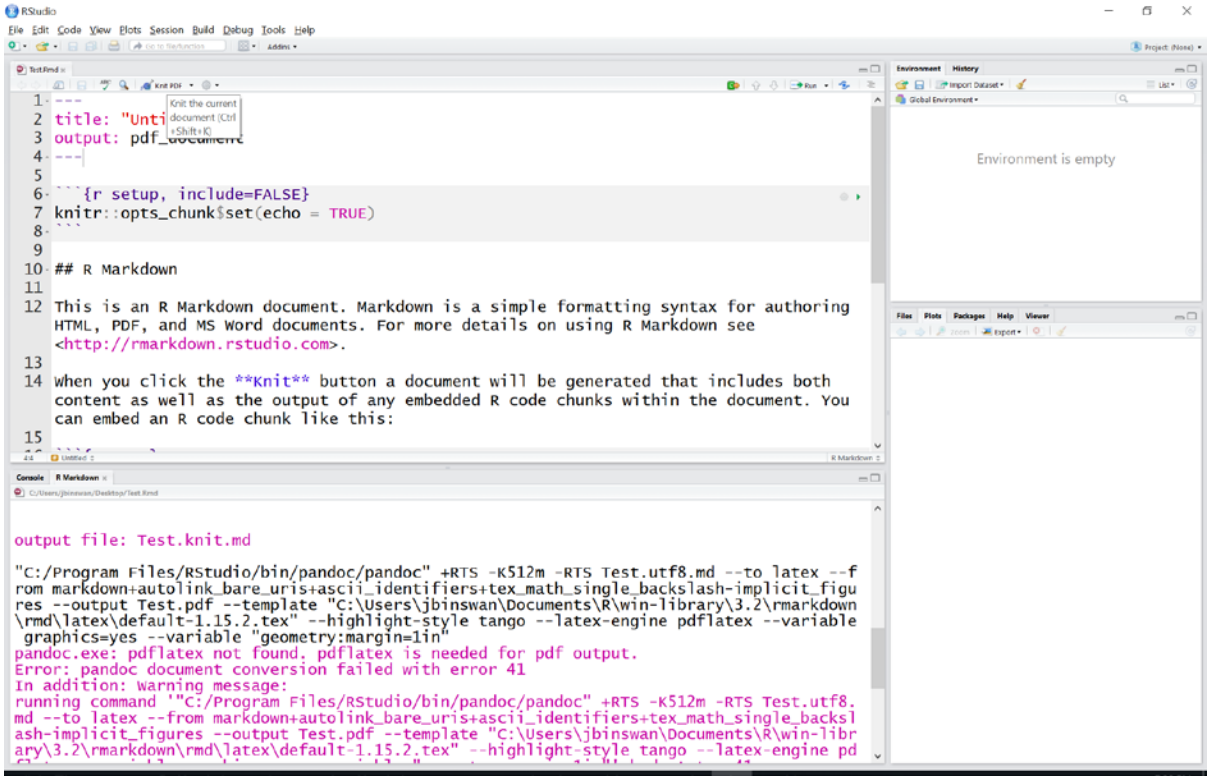


Here it is…

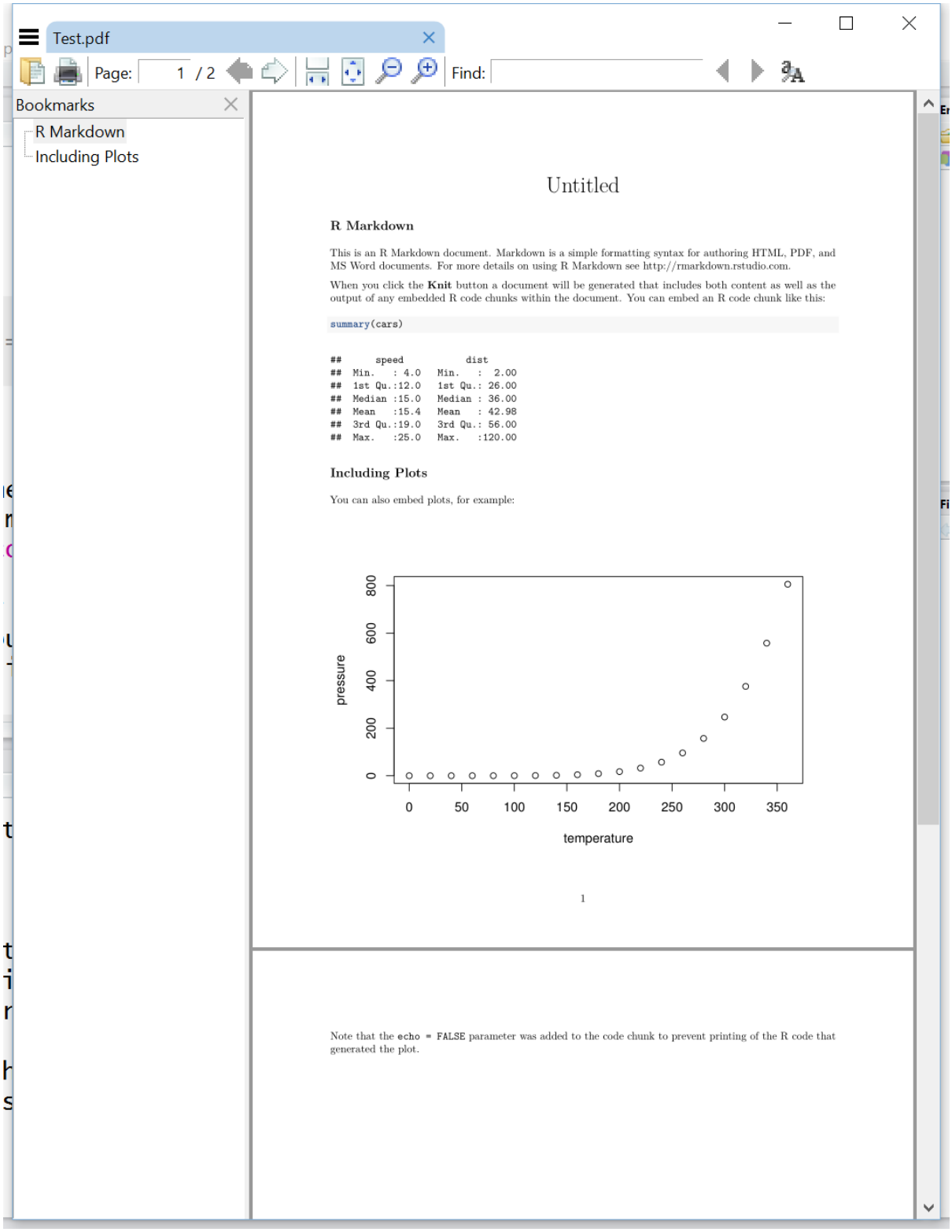


But you will probably never touch it. RStudio does it for you.

Check now whether compilation from RMarkdown to pdf works.



Not yet… So restart your machine, open RStudio, run the compilation again, and it works beautifully!



You can now delete the folder MiKTeX Download files (which is probably on your Desktop if you accepted the default directory).