Setting up R and Friends

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Contents

1 License

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2 Overview

These are instructions for setting up R and RStudio.

It is critical that you have a working R installation *before* the first class. Please follow the directions below, as soon as possible. You will

- install R and RStudio
- download and run the sample program to test your installation. Running this file will take some time because it is doing two things: It will install additional packages, and it will download stock price data and create plots and regressions using the data.
- install LaTeX following instructions below. (You need to do this *after* you run the sample program, which will install the tinytex package.)

Because all of this might take some time, *please do it well in advance.* If you need help, you may contact KIS at 847-467-2100 (Global Hub) or 312-503-0159 (Weiboldt) or by email at kis@kellogg.northwestern.edu. They have tested these instructions and should be able to help if you encounter problems.

3 Detailed instructions

You will first install R, RStudio, and L^AT_EX. You will then use RStudio to run an example program (linked below). Running this program will verify that your installation is working. It will also install additional packages that we will use in the course.

If you already have the programs installed, please visit the software web pages to make sure that your versions are up date.

3.1 Install R

3.1.1 If you do not already have R installed

R installers for Windows and OS X are at https://mirror.las.iastate.edu/CRAN/. Download and run the installer for your operating system. If the installer asks questions, accept the defaults unless you have a reason for doing otherwise.[1]

3.1.2 If you already have R installed

If you already have R installed, you can check the version by running `R.Version()$version.string` at the command line. Most likely, any version later than 3.0 will be fine. The latest version (as of August 2018) is 3.5.1. If you update from a version earlier than 3.5.0, you will have to reinstall all of your packages from scratch.

3.2 Install RStudio

RStudio installers for Windows, OS X, and Linux are at http://rstudio.com/. Download and run the installer for your operating system. If you already have RStudio installed, please be sure to update it to version 1.1.456 or later.

Note that RStudio is not the same thing as R! RStudio provides convenient access to R, and adds components such as pandoc. *You need to install both R and RStudio.*

3.3 Install L^AT_EX

L^AT_EX is a suite of programs that collectively produce pdf documents; there is no individual application called "LaTeX". You will never have to run any of these programs yourself. Rather,

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[1]The current versions of R require OS X 10.11 or higher. If you are using an older version of OS X, you probably know that Apple has stopped issuing security patches for OS X 10.10 and earlier. If you are sticking with your unsupported OS, follow the directions at the installer page to install either R 3.3.3 (10.9 or higher) or R 3.2.1 (10.6-10.8). This will probably (but no guarantees) be sufficient for your needs at Kellogg. However, if you are running a version of OS X older than 10.11, you are at risk and you really should update the OS.

RStudio uses LaTeX, behind the scenes, as needed.

3.3.1   You already have LaTeX

If you already have LaTeX installed, you don't need to do anything else in this section.

3.3.2   You do not have LaTeX

If you do *not* have LaTeX installed (if you aren't sure, you probably don't) then you can install a minimal version of LaTeX by running this command at the console in RStudio:

```
tinytex::install_tinytex()
```

For general information about LaTeX see the the LaTeX project page.

3.4   Run the sample program

1. Save stock-data-example-base.Rmd to your computer. You should use a directory where you will save documents associated with this class. Running the program will create output files (both data and HTML files), so you should pick an appropriate location. *Be sure to save the file using the extension ".Rmd"; your browser or operating system may try to append ".txt", and this will potentially cause problems. If this happens, just delete the appended ".txt" before or after saving.*

2. Run RStudio and use the File|Open menu to load stock-data-example-base.Rmd. (Make sure that it is saved with a .Rmd extension.)

3. After loading the file, click the "knit" button (see Figure 1). RStudio will likely ask your permission to install necessary packages. Allow it to do so. When it finishes installing packages, you may need to click the "knit" button a second time.

4. The document you produce should include figures that look like Figure 2, along with some additional tables.

5. Take a look at the output (and possibly the code — don't worry if you don't understand any of it) and think about these questions:

    a. How would you have done this exercise in Excel, i.e. what would be involved in downloading stock price data, computing returns, constructing four plots, and creating an html version of your exercise?

    b. What would be required to do this exercise for 1000 stocks? (Please don't attempt this – someone is providing server capacity; let's not abuse it!)

    c. How would you create a Word document (docx file) reporting these results?
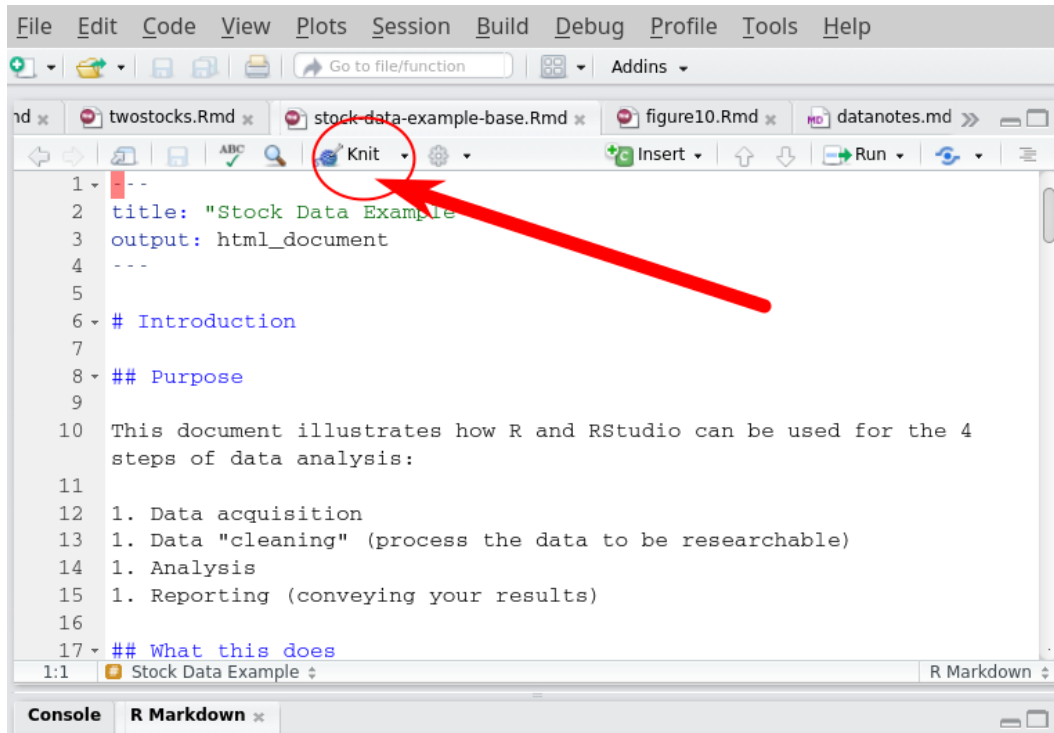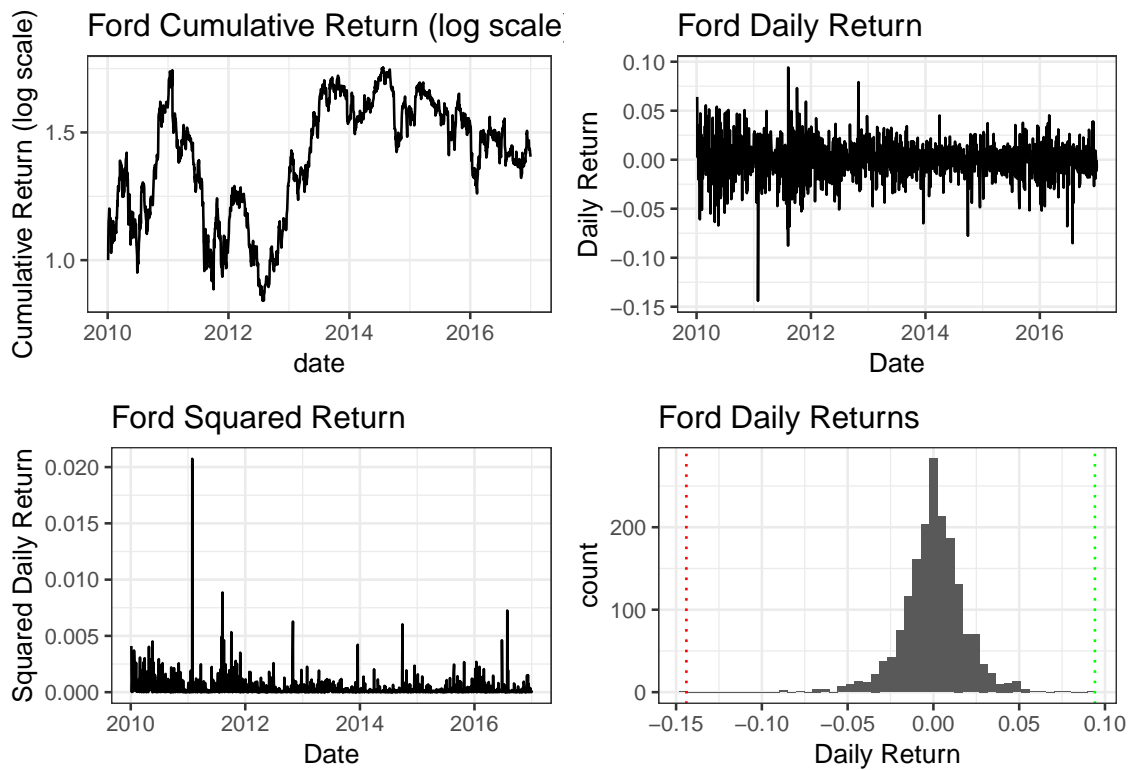
Figure 1: Knit button in RStudio

Figure 2: Various views of Ford's stock price return