Module 1 – lesson 05

Now for some fun stuff! Today you’re going to download and install both R and RStudio.

So what is R? R is a language and environment for statistical computing and graphics. R is based on the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues.

R is Free - both in terms of no cost but also as FREELY distributed and shared under the GNU general public licensing.

To learn more about R, you should visit the R-project website. This site provides good information about what R is, who the key contributors are, and information about the development of the R language. Links are provided for the manuals, frequently asked questions, and other resources like books about R and “The R Journal”. At the top of the page is a link to CRAN or C-RAN where you can download the R software.

Go ahead to the CRAN website to download R. The link from the R project website, takes you to the list of “mirrors” or servers around the world that host the code and files and installers for installing R. You should pick the mirror closest to your geographic location. For example, at the bottom is the list of mirror sites for the United States. The one hosted by Duke University is closest to my location.

You can also access this download page by directly going to <https://cran.r-project.org/> At the top, there are links for the different operating systems for Windows, Mac or Linux. Choose the one for your operating system. For Windows, you'll want to click on the link for the “base” installer. This will take you to a page with a link to the executable (EXE) file that you'll need to download and run to install R on a Windows computer. When you click on the link for the Mac operating system, you are provided the link to the package (PKG) file needed to install R on your Mac.

Go ahead and take a few minutes to download the installer needed for your operating system. Run the installer, follow the instructions, and accept the defaults to install R on your computer.

Once R is installed, for example, on a windows computer, you will see R listed in your /Start/Programs list and may also have the R program icons shown on your desktop.

It is worth noting that this is the minimum software you need to use R. For example, we can run the R program and when it opens you get a simple command line interface. You can use this to submit and execute R commands. For example: you can do simple math like typing in 2+2, or finding the mean of an array of numbers like mean(c(1,2,3,4,5)). Try this out on your computer to test and make sure R is up and running on your system before installing RStudio.

Programming in R using the basic interface is not the best way. Let’s also go ahead and download and install the RStudio software. RStudio is a fully integrated development environment (IDE) and is the key interface we’ll use for the rest of the course. Not only does RStudio link directly to R and provide a much better programming interface, RStudio allows you to create great rmarkdown documents in multiple formats and then links everything to your Github repository with version control using Git. We’ll cover Github and Git in the next lesson.

Go to <https://www.rstudio.com/> I encourage you to explore the many other products and services available from the RStudio organization. Check out their resources, which include free webinars, videos, and online learning.

But let’s go ahead and download and install RStudio. Go to products and click on RStudio desktop. We will be using the FREE Open Source edition. Click on Download RStudio Desktop. Click the download button for the FREE version – this scrolls down to a list of installers. You need to read the file names to find the one right for your operating system. The first link is for the Windows installer, next is Mac followed by various flavors of Linux. You'll want the “Installers” not the “TarBalls or “Source Code” – these are primarily for developers.

Go ahead and take a few minutes to download and install RStudio and get it up and running on your computer.

Once RStudio is up and running, you should see something that looks like this. We will explore this interface further in future lessons, but for now, let’s look at a few basic things. The main window on the left is the same basic “console/command line” window that you saw when you ran the basic R software. Like before, we can type commands and R code here. Like 2+2 and mean(c(1,2,3,4,5)). But you’ll notice there are more windows on the right side including information on your environment, history, files, plots, packages, help and viewer. To learn more about the RStudio interface, I've included several helpful links in a reading page after this video lecture. There are literally thousands of resources for learning more about both R and RStudio. Just pick your favorite search engine and search for tutorials on R and RStudio.