

## **Lecture 12 : Installation of RStudio**

**Science Communication: Research Productivity and Data Analytics using Open Source Software**

**Mohit Garg**

**Central Library**

**IIT Delhi**

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Dear Learners, Welcome again to this journey of learning R. So, I hope you have tried those subtraction multiplication and division, but I have discussed in the last lecture. If you have not tried so please try before starting this lecture and please post your responses in the discussion forums. So, if you have noticed that to do the multiplication in R we have to do  $2*2$ . So, we do not have to use this cross sign. So, if you do like this 2 or maybe X into 2 because when we used to do the pen paper multiplication we used this cross symbol, but this is the symbol you do not have to use in R.

So, for R if you have to do the multiplication you have to use the '\*'. So, this particular star is generally available on the keyboard on where number 8 is written. So, then if you have to do the division, we have to use this '/'. So,  $2/2$  is showing 1. And if you have to do the subtraction, so subtraction is the same whatever we used to do  $2-2$ , it is showing 0.

So, if you have noticed here that the interface of R is not that user friendly. When I was discussing the word completion. So, each time you have to press the tab to see what exactly the commands are. Because whenever you will be using R there are a lot many commands there and you cannot remember all the commands. I cannot even remember all the commands. So, this autocomplete helps in completing this command correctly so that there should be no error. Also whenever we will be doing the analysis we need a text editor that has some color based highlighting features. There are various reasons that can save us a lot of time in doing the work on R. So, this demands the need of a platform whose interface is user friendly and provides code editor console and various other tools at one place. So, these kinds of platforms are commonly known as IDE or Integrated Development Environment. These are the software which provide the interface to your software so that you can use it effectively. So, these are just the front of your software which is at the backend.

So, these are some of the examples of popular IDEs that include RStudio, Visual Studio code, Jupyter notebook, Eclipse, R commander, R keyboard, Emacs and ESS. But among these RStudio is the most widely used IDE for R. RStudio is available in both open source, and the commercial edition. However, the open source edition is sufficient for researchers in doing the analysis. So, to install RStudio you have to open the URL.

So, this URL is. So, you have to open this URL and as soon as you open it after opening this webpage you will find a different installer for installing the RStudio. By default for this particular machine it's Windows. So, here you will see that the second option is installing an RStudio desktop for Windows. But for other operating systems the installers are available, for example you want to have RStudio in Mac or Ubuntu or Fedora.

So, as you can see, whatever we have discussed about R, that R is available for all the three kinds of operating systems like Windows, Mac or Linux base. RStudio is also available for Linux base machines or Mac or for Windows. And you can install and then you can download this installer and install the RStudio the way we have installed the R. So, once you click here the file will be downloaded which has a size of almost 216 MB. So, this particular version is released on 10th January 2024.

And once you download this file so this kind of file will be downloaded in your machine and just run this file with the administrative right following the default setting and after following these the RStudio will be installed in your machine. The way we have opened the R application in Windows in the similar way we can open the RStudio application through either double clicking on the RStudio icon on the desktop or through the Windows application. If you see on this web page from where you will be downloading the RStudio. So, the option of downloading the RStudio is provided at step 2. So, you have to remember that RStudio is just an interface, it is nothing without an R.

So, the first thing is you have to install the R and then you have to install the RStudio. RStudio just provides you with a beautiful interface for doing the analysis in R. You will be doing the whole thing in R itself only but we will be using a beautiful interface because that raw interface is not that kind of user friendly. Now once you will install it, I am again assuming that you have installed RStudio perfectly on your machine, and still if you are facing any issue in installing RStudio please let us know through the discussion forum and answer all your queries. So, once you open the RStudio application you will see these four kinds of quadrants in one single application.

So, if you see R only one kind of quadrant is available. But in RStudio see there are these four quadrants available. This is just a console. It is like R only. But we have still used it in previous lectures. Then this is the second quadrant which is also known as source. This is the third quadrant which is also known as the environment. And then this is the fourth

quadrant. So, these are the four important quadrants, which ease down to your task in doing the analysis.

We will see each one by one so the first is this console where we execute the code just like the R interface only. So, then the console that also has a terminal if you see here in R there was like this single console was there. but the RStudio console is there. but this terminal is also there. So, what this terminal is so this terminal is like a command prompt what we have in Windows or a terminal. So, from here we can do all those things also like a command prompt and if you see here the other tab is background job. So, if you have a long script and you have to do long computation you can use this where you can run the command in the backend.

You can use this for running the long script in the background. So, this is the part of the source where we do the coding. Then the third part is the environment. Environment quadrant it has tabs of environment history, connection and tutorials. So, the environment displays all the objects created and their details like what it is, like this particular data has 12 observations and 3 variables.

So, it provides you with the details of all the objects. So, if you remember in R what we have to do to list all the objects we have to go to the Miscellaneous. So, we have to go to this menu and then we can use this. If we click here. it will only display all the objects only. It will not display all those exactly the number of variables there. and what exactly that particular object is.

So, this is an additional feature in the RStudio interface so that you can get more details about it. What are the previously created variables? Then it has another tab of history where you can see all the commands used previously. But in the R interface what we have to do is we have to go to the file and then we have to save the history. And then this history will be saved and then we have to open it. So, another important feature of RStudio is connection, which allows you to connect to the database.

So, if you click here if you click here then you either can connect to data sources like through ODBC or spark. This is again a very important option available in R. What are the options that we have in the R interface here. So, under help we have different manuals and then we can click on what are the manuals we want to use. But here in RStudio interface.

So, if you click here and install this package learner. then you can have the old tutorials. Let's say for example if you click here this package will be installed. And after clicking here you see that here for data basics this tutorial is there and you can click here start the tutorial. and it will show that another version of this package is required to start this tutorial. and then you can click here. Install all the dependencies now. It has a tutorial

about the basics of data. So, then we have this fourth quadrant which is also known as the output quadrant which has files, plots packages and help.

So, under files have the details of all the files in the directory. then the plot so all the graphics that are generated. Then this package displays the list of installed packages with package name, description, and the versions of this particular package. So, this Help tab shows the R Documentation that helps in navigating knowing about the commands and other things. So, if you notice that the interface of RStudio has a lot of options. Now we will see the different menus available in RStudio like what we have seen in R. So, these are the different menus available in RStudio.

So, under this file it has an option. so it has an additional option to compare to the default R interface is that you can import the dataset. So, simply you can click here and if your dataset is in Excel or SPSS or SAS whatever format it is so you can import the dataset. Then the edit options allow you to like the same like you can clear the console or you can like cut, copy, paste. Then these code sections allow you to like if you want to go to a particular file or function in particular code, or you want to format the code. So, these are some of the functionality this code provides you.

Also if you have noticed that this RStudio is also showing the shortcut key of each of the functionality. So, for example if you want to go to file and function you can just simply press control plus period and then you will go to that particular file and function. Then you can like if you want to reformat the code you can just press the key control shift plus A. Then the next menu is the view menu where you can just zoom in or zoom out or then you can see what the details are available here, like environment, history, connection you can see here also like you want to show the history so history will be shown. So, then also you can like to see the history you can press the control plus 4.

Basically this particular functionality helps when you have a plot when you have plotted some graphics so whether you want to save this as an image or PDF we will see in detail when we will be plotting different analysis in R. So, the session menu has the functionality of like setting the working directory so you can change the working directory or you can load or save the work you can load or save the workspace or you can quit this session or you can start a new session also. If you remember that in the R interface these details were here. So, these details were in the file. But here they are provided. The RStudio interface has these details under this session menu. Then if you want to configure any build tool you can hardly use this, hardly this will be required.

Then if you want to debug the code you can use this different functionality of this menu. then this 2-3 menu will not be much required. Then this tool is another important menu which will be required during the analysis. And it has different important functionality. One of the important functionality that the tool has is that it installs the packages so you

can install the packages unlike like in R we have to select the mirror and then we have to go to the package name. It will list all the packages. But here that search feature is available. you can just type it down the package name and it will list it down and what are the packages you want to install you can select and it will be installed. Then in the tool it also has the option of this global option. This global option is about setting to do the different settings. like say for example you want to change this layout.

So, by default setting this particular area is the console. And this is the source here but you won't console in place of this where environment and history is okay. So, how you can do that you can just simply go to the global option. And then in the pane layout you can just put the console and it will automatically come here. And then apply and if you go okay. So, if you see here the console and this environment are interchangeably diagonally. Now the new location of the console. So it depends on how comfortable you are and where you want to keep the pane at which location.

So, it totally depends on you. So, generally RStudio comes in this kind of setting. So, generally the default installation of R comes in this kind of interface where we have a console here. So, I found that if we have console and source code on this side it's quite easier to do the things. So, but of course if you want to change the location of the pane to here or some other place you can do that. Okay the other options are similar to what we have seen in R. If you want to change the font style or if you want to change the color or if you want to change the appearance of how it will look, you can change it by going into this appearance tab. And so there are different themes available for the editor.

So, generally this particular theme is also preferred by many of the users. So, either you can go this and then if you apply. okay. So, this is how the RStudio interface will look like this. Okay so it totally depends on you how you want to have the interface.

I will go with this Chrome. So, I will just apply. Okay then it has other options like if you want to have a Python interpreter or like these packages. and all those things are there we will be using throughout this course the different options and when we will discuss in detail whenever we will be required to do those things. Okay so the different options are available under this tab tools. So, in the end it has a menu Help which we have already seen in the R interface. Also that it has different options other than that it has one important option is that it has cheat sheets. Like many cheat sheets are available by default depending on how you want to use them. So, if you go here it will directly take you to this page where you can see exactly what this particular pane is and what this feature is.

So, you can use this different cheat sheet to know more about the R and RStudio. Then it has a package specific cheat sheet also. Like if you want to see the cheat sheet of data visualization with ggplot2. Okay or if you want to see the R markdown reference guide.

Okay so it will open here and these are the things all the things are provided here. It has many cheat sheets. and also you can browse the different cheat sheets by clicking here. So, these are like different cheat sheets available. then it has an option of keyboard shortcut. If you want to know anything about the keyboard shortcut you can just click here. and these are some of the keyboard shortcuts available which you can use while you are using the RStudio.

Okay this is about the interface of RStudio. So, if you have noticed that the interface of RStudio has many features compared to the default interface of R. So, this is why RStudio is widely used by the R users. So, throughout this course we will also be using this RStudio only for doing the different analysis in R. Okay now just see some of the examples that we have seen in the R. So, we will run those same arithmetic operations in RStudio also.

So, if you see here if you go to the console and if you just put  $2 + 2$ . It is showing 4. if we go  $2 * 2$ , multiplied 2. It is showing 4. So, I think it is working fine. It shows the right answer. This is how you can also try other different operations in RStudio and please let us know in the discussion forum if you are not able to install RStudio, or R, or if you are facing any kind of issue related to that. Also try the example that you have used in R the same example you use in RStudio also. Share with us those things in the discussion forum. Thank you.