

# **Multivariate Procedures with R**

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**Week – 01**

**Lecture – 03**

## **Command line and Data Editor**

Hello friends, welcome to the course multivariate procedures with R. So, you can recall that in the last lecture we had talked about how to take help, how to take example, how to see the demonstration in the R software on various commands. So, now I am sure that you are in a position to have a quick review of the R concepts. And now continuing on the same lines in this lecture also I am going to give you some quick brief introduction to the concepts which are useful in this R software when we move forward. So, these concepts are very simple but my idea is only to keep you or give you a good brush-up So, that you can recall the things what you learnt some time back. So, let us begin our lecture.

So, in this lecture we are going to talk about some basic concepts about command line and data editor. So, you know now you can recognize this window, this is R GUI window and here you already have used but still to give you a formal introduction this is your here prompt sign. And all these things which are written here they are basically about the R software. Right, we are not going to use it but they are only for the information.

For example, here it is saying that this R version 4.3.2. So, this is the available at the time when I am trying to record the video. Now if you try to see here after this prompt sign, this greater than sign there is a space here where one can actually line.

This is called as command line and command line is the place where we type our syntax and commands in the R software and after typing, we press enter to execute them. Right? Now one main difference between R and other software, in R software we have many commands but they are not menu driven. Menu driven means there are some buttons. For example, if there is a button like where it is written mean, there is a button like where it is written variance and you try to click over these buttons and you get the answer. No.

Here you have to write the commands on the command prompt or inside the programming file. So, it is not like clicking over the buttons as in some other software. We need to type the command. When we try to type the command then single line

command as well as multi line commands are also possible. When we are writing the single line that means any command over a single line then after typing it you have to press enter and it will be executed if the command is written in a proper way.

And then in case if there are more than one command, So, every command can be written in each of the line but it is more convenient if you try to write down the multi-level command where you have to write more than one lines in a file. And those files can be created using any text editor. And I would not advise you to type the multi-level commands inside the R software also because in case if you make one mistake many times the previously typed things are lost. So, it is a better option to use the text editor. Right? So, now in order to use the text editor there are several options.

One common option is that R software also has a built-in editor. So, if you try to go to the R GUI window then in the menu bar there is a command here, there is an icon here file and if you try to click on the file there will be new script. And this option is there and you can click over this. For example, you can see here, here I am trying to give the screenshot that this is your R GUI window, this is your here file. Now if you try to see here, there here is a command new script.

If you click over here then after that new window is excused, is opened and then you can type your commands in that window. That is actually a text editor. Right? And once you try to type the command inside this text editor, after that if you want to execute it, it will be like this. That suppose this is your text editor and you try to type here something A, B, C, D suppose and if you want to execute it on the R console then the process is you try to highlight it and then press Ctrl R. So, this command is going to be executed on the R console.

And if there are more than one lines then you have to highlight all the lines which you want to execute and after that you have to press Ctrl R and the command will be executed. So, let me try to give you this demonstration on the R GUI window also. So, you can see here this is your here R software. If you come here, if you try to watch the movement of this mouse, this arrow. So, you can see here there is a command here new script. Right?

I click here and this text editor is open. Now I can type here anything. For example, suppose if I type here 2 plus 3 and then in the next line, I type here 5 plus 6 and now suppose I want to execute only the first line 2 plus 3. So, I am trying to highlight it and then I am pressing Ctrl and R key together. So, you can see here this change has occurred here in the R GUI window where I am trying to highlight it.

So, 2 plus 3 has become here answer has become 5. Now if you try to see I want to execute 5 plus 6. So, now if you observe what the changes are going to be here at this place. So, I try to highlight it and I press here Ctrl and R together and you can see here

this has become here 11. Now suppose I want to execute both of them at the same time, So, I am trying to highlight both the lines and again I press Ctrl R.

You can see here that this 2 and 3 and 5 and 6, 2 plus 3 and 5 and 6 they are executed together. Right? So, similarly, you can imagine that if there are more lines are here and if you want to execute all of them then you can highlight and execute them. Yes, do not get confused that if you want to write a program then every time you have to do it. No, certainly not. When you are trying to write down a bigger program then you will have to write down the function and functions are executed in a different way. Right?

So, this is only for this aspect. So, now this is first option. Second option is that you can simply use here the notepad or external editor whatever you want and then you can copy the commands from that external notepad or any text editor and paste it inside the, just text editor inside the R software. Right? And next option is that we can use some secondary software. For example, in the last lecture we had talked about two software, one was Tinn R and say another was RStudio. Right?

So, yeah, means that is your choice, this is your preference that you are comfortable with which of the software. But at the moment in this lecture, in this course I am going to demonstrate the use of RStudio software. This is also a free software and you can recall that in the last lecture we had talked about it. So, now the way I am going to do it that here I am trying to give you only here a glimpse that how this RStudio software looks like and the second question comes how are you going to operate different commands in this software. So, in this lecture today I am going to give you only a brief idea that what are the different options available in the RStudio software and then in the next lecture I will try to give you a quick review of the different types of syntax and commands and various types of available options in the R software how you can use it.

But as I told you earlier that I would be working only in the R console with the R GUI window because I do not want to make this course dependent on the this RStudio or any other software and I explained you in the last lecture also that it is more advantageous if you try to learn this course directly on the RGUI window rather than getting dependent on any other software. Right? So, if you try to execute the RStudio software then you will see here this type of screen will come. Right? There are 4 windows or the whole screen will be divided into 4 partitions say number 1, number 2, number 3 and here number 4. And now you can see here what is really happening. In this window number 1, this is a place where you try to type the commands and it works just like a text editor, I will say which was inside the R software.

Now if you try to see in the window number here too, can you identify what it is? It is simply your R GUI window. This is the same window which appears once you start the R software. And then we have here window number 3. In the window number 3, although it

is not visible here, but here in this place all defined variables are indicated here. This whatever variable you are defining, whatever is the nature of the variable that is indicated at this place. Right?

And then there are some other options also. For example, even if you look at this window number 1, there is an option here run source etc. and similarly in the window number 3 here, then option here import dataset in history, environment etc. So, there are several things which can be done even inside the single window also. And window number 4, here if you try to see there are different options.

You want to create a new folder, delete, rename and then if you want to make any plot, packages, viewer etc. etc. So, you can see here this is the advantage of R studio software that many things are clearly visible to you and they are always in your front. For example, if you try to look here, let me try to change the colour of my pen. If you try to look here, this is about import dataset.

What is this? You know when you are trying to work in statistics, there are always some datasets which are stored in some file. They can be in an excel format, they can be in text format, they can be in the CSV format, they can be in the form of any spreadsheet etc. And if you want to read the dataset inside the R software, then there are two options. You try to write the command on the R console and then it will read the file. The second option in the R studio is that you do not need to remember the command but you simply click over here import dataset and then it will open something, you try to choose the file and it will automatically be imported inside the R software.

Similarly in the fourth window if you try to see here packages, you can recall that in the last lecture we had talked about how to install the package, how to download the package, how to load a library etc. Now all those things they can be done here with the clicks. Right? So, that I will try to show you in the next lecture in more detail. But this was the basic idea that in the R studio software there are going to be four such windows and these windows are doing different types of job and yeah size of the window that can be interchanged. For example, you can see here this is the partition but by using here by putting your mouse over this line you can drag and change the size of the windows also in all the direction it is possible.

So, this is how this R studio becomes useful and people try to use it. Right? So, before I try to show you here this R studio briefly, first let me try to explain you what I am going to do. I am going to use here three functions, library So, that I can load the library mass. Then I am going to use the command here attach and bacteria inside the parenthesis which is a file. Right? And then I will try to edit this file So, I use here the command fix bacteria. Right?

And as I said in the case of R software also if you want to execute only one command then you simply have to highlight it and then press Ctrl R. Similarly in this case also you are going to write all these things in the window number here 1 which is here. And after that if you want to execute one command or say more than one command you simply have to highlight for example if I want to execute only library mass then I will highlight it and there will be a button there run. You can see here this is here the run where I am trying to mark the circle. If you just click over there then it will happen first.

Let me try to show you that what will happen here and I use So, that you can understand it. So, now you see this is your here window number 1 where I have typed these commands over here and now, I am trying to highlight it. Suppose I want to use only one command or I want to execute only the first line library mass. So, as soon I click on this button here run. So, first I try to highlight it then I try to click on the button run and simultaneously you can see here in the R GUI window there will be some change and the same command which I have written in the window number 1 will be executed in the R GUI window which is your here console right.

And instead of using this button here run you can also use here Ctrl plus enter which you will see when you try to put your mouse on this button you will see this message that you can also press here Ctrl enter. Right? So, if you try to understand this thing, I will try to show you in this inside the R studio software also and then I will try to execute these three functions over here. Right? And these functions although I have not discussed yet but I believe that you are aware of these functions So, you can use it here. So, before I try to show you in the R studio the screenshot of the window that how it will look like.

So, this was my command. I have written here, I have typed here, I have highlighted here and then I press here run and then after that here I try to see here attach bacteria, fix bacteria then as soon as you press here on the source you will get here this type of window. So, you can see here this is the data editor. This is the data editor in which these columns are going to give the different data set which are inside the bacteria. Right? And this is about the data which is under this library MASS. So, this is what I was trying to write down here that once you try to do it there will be a built-in data editor within the R also and this is sort of data frame and you can edit it right.

Okay now let me give you some idea of that how this R studio look like. So, you can see here these are the four partition in the R studio software. So, this place here where I am trying to highlight this is your here window where you are trying to type all the syntax and commands. And then there is a window here where I am trying to move the cursor. This is your here if you try to identify this is simply your here R GUI window.

And now if you try to see here in this window which I am trying to show you here which I am trying to move my cursor it has this environment, history, connections, tutorial, etc.

And this is here the fourth window where there is something here files, plots, packages, help, viewer, presentation, etc. all these things are here. So, now if you make this R GUI window clear So, I press here control L the same command and suppose if I try to write down here say couple of commands here say 2 plus 3 then 8 plus here 9 and say here 7 minus 8. Now if you want to execute only the one command you highlight it and you can see here this is here is the button run.

So, earlier you used to press control R in the R software but now you press here run and then you have to see what is happening here at this place. As soon as you see here run you can see here 2 plus 3 is executed here. Right? And similarly, if you try to highlight all the things together and then you press here run you can see here all of them have been executed in this R GUI window. Right? Similarly, here in this window where I am trying to move my cursor it is here environment, history, connections, tutorial, etc. So, they are trying to give you different types of help.

For example, if you try to see here if I try to click here at data you have to see what will happen in the window number 1. Right? You can see here that it is data is trying to give you this information. Okay, this is set of 4 observations on 2 variables whose values are there and if you try to press on this data, you can see here in the window number 1 this data has been stored in this particular way and this is visible to you. And here it is trying to give you all the information from the past which has been used on this computer in which different types of data sets have been stored. Now if you come to the last window there is here file, then here plot, then here packages, help, viewer, presentation, etc., etc.

So, as we try to analyze the data over then, then you will see that how these things are going to happen. For example, if you see here package, this is here user library. So, if you want to install any package here this is very convenient that if you try to say here just click here install it will try to ask you that which package you want to do it and then you can just give the name and then it will go to the website of the CRAN mirrors and it will try to get the package over there. So, and if you want to say upload any library you simply have to come here and you simply have to click here and then you can see here this library *abind* has been executed as soon as you make here a tick box. Right? So, this is the advantage of using this R studio that many functions can be viewed here in a single screen and it becomes more helpful when you are trying to do programming.

Anyway, in the next lecture I will try to show you some examples that how you are going to execute it in more detail. And now the last topic of this lecture that whenever you are trying to do any programming you always try to give some name to the variables. So, now suppose the situation that somebody has worked on your computer and it has been defined that suppose x is representing the height of the students. Now after you leave the computer someone comes and he or she again describes miss another data set and the data set has been given the same name.

Suppose now `x` takes value the weight. Right? So, now as soon as you say `x` equal to height this will overwrite `x` equal to height without any prompt. And now if the first person come, he or she might be thinking that this is the data on the height all the calculations will consequently become wrong. So, it is always a better practice, good practice that you try to remove all the variable names which are already stored in that computer and you want to use them. So, in order to remove those variables, the command here is `rm` and inside the parenthesis you can write the name of the variable or if there are more than one variable then you can write down the names for the variable like as `rm` and inside the parenthesis `x, y, z`. So, it will remove the three variables from the R software and then you will be in a position to write your variable in the way you want. Right?

So, now let me stop here in this lecture and you can see that it was a very elementary lecture where I have given you that how you are going to use different types of data editors for executing your program. You can use either notepad or the built-in window or the R Studio window to type your commands and after that there are different ways to execute those commands depending on the choice of the software. But once again I would say I am not limiting you to use only this two software. In fact, you can use any other software wherever you are more comfortable. The main idea is that we want to execute those command inside the R GUI window, R console.

And the program is going to be executed only in the R console in whichever editor you want to write, in whichever software you want to write. And it is only a matter of convenience that for example you have seen in the case of R Studio that there are four windows and you can see lots of information in a single view and that helps the programmer when they are trying to write the program. So, I would request you that you please try to have a look and try to see about these commands, try to play with the software, try to use this R Studio and try to see what are the different windows, there are different options, what are they trying to do and in the next lecture I will explain you about the use of R Studio in more detail. So, try to practice it and I will see you in the next lecture. Till then, goodbye.