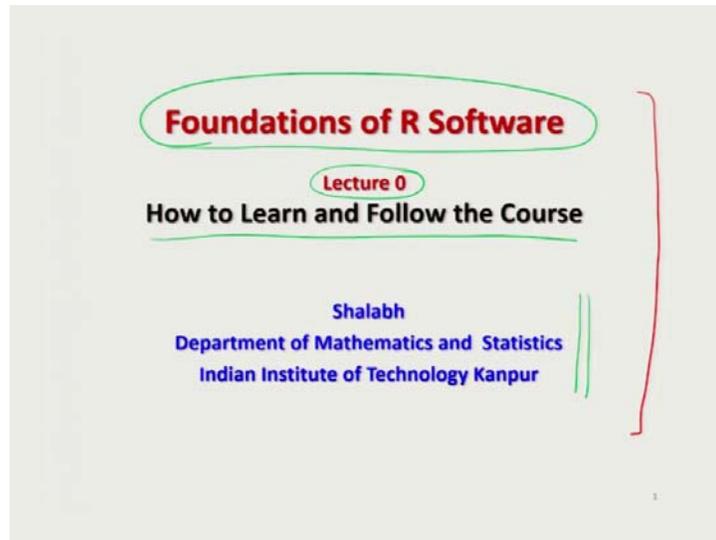


Foundations of R Software
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Lecture - 00
How to Learn and Follow the Course

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Hello friends. Welcome to the course Foundations of R Software and in this lecture, we are going to talk about a very simple issue that how to do this course? And the reason for this issue is the following:

This is a course which is for the software. So, when you are sitting in my class and we are face-to-face, then in case if I ask you to do something and if you try to execute it on your computer, and in case if you are facing any problem then possibly I can always come to you and I can explain you, ok, here at this line you have made this mistake and you can correct it.

But now the problem is this we are not face-to-face sitting, we are not sitting face-to-face. But I will try my best that this should not be a problem in understanding and learning of this R software. So, for that we have to follow certain rules, and by following these rules we can avoid this problem and we can learn the R software in the best possible way. And that is what I am going to explain in this lecture.

So, you see I have got here a pen, and I have prepared the slides for this course. So, with this pen, I can write on my computer screen. So, when I am trying to write something on the computer screen, then there are going to be three types of different things which you have to understand.

First is the instructions and commands, which have to be followed inside the R software. Second, when I am trying to explain you something and these are only expression, they are not to be executed in the R software. And third part is that whatever be the outcome when we are trying to execute something inside the R software that has to be copied here, and that you have to understand that what is the difference between the instruction that you have to give to the R and what R is trying to give you back.

So, in order to understand these things, I have created some slides and then we have certain rules. So, let us try to understand these rules. And when I am trying to explain you I will also be using the R software and I will try to demonstrate that how to execute those things. So, how both the things are going to be combined together, this is what we are trying to learn in this lecture. So, let us begin the lecture.

So, you can see here this will be my here course title page. And here you can see here I have got a button from where I can change the colour of my pen. So, you can see here the first line is the title of the course. And then second line will be the number of the lecture for example, this lecture 0.

And after that the title of the lecture that will indicate you what are we really going to do in this particular course. So, the title of the lecture is how to learn and follow the course. And after this these are the details about my name and my affiliation, ok.

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Basics

Blue Colour Courier New Font means a Command or Syntax in R.

Black colour Calibri font means usual expression.

Example:
Statement: The assignment operators are the left arrow with dash \leftarrow and equal sign $=$.

$x \leftarrow 20$ assigns the value 20 to x . → R command

$x = 20$ assigns the value 20 to x .

Now, after this you will see that there will be something which I am trying to type in Blue Colour Courier New Font. So, this will look exactly like the same way as I have typed here.

So, when I am trying to write something in blue colour courier new font, this means this is a command which has to be executed in the R software and when we are trying to see something which is written here in black colour Calibri font, it is the same black colour Calibri font which I have circled here. So, this means it is the usual expression. And this is just to explain you and need not to be executed inside the R software.

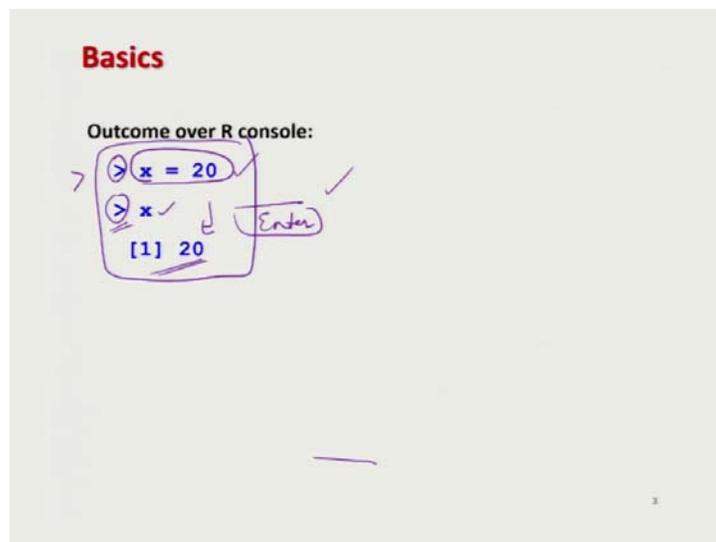
For example, if I make here a statement. So, I will write it like this statement is the assignment operators are the left arrow with dash and equal sign. So, now, in this statement you can see this is written in the black colour Calibri font and this these two things they are written here in the blue colour courier new font. So, this means these are the simple expressions, which are for your understanding and these are the R commands.

So, what are they going to indicate? That we are going to learn in the forthcoming lectures. But here I can write here this type of symbol here like this, less than and dash, this means we are going to assign a value to a variable. And another alternative for the same operator is the equality sign here like this, right.

So, now in case if you try to see here I am writing here like this `x <- 20` assigns the value 20 to x. So, this means here now I am changing the colour of my pen. So, this `x <- 20`, if you try to write statement in the R software, this means that this is assigning the value 20 to x, x is my here R command, means something which you have to type inside the R software.

And the same thing you can also write as `x = 20` assigns the value 20 to x, this means you have to type `x = 20` in the R software, and then this is the R command. So, you can now easily discriminate between the two types of sentences, which are to be executed inside the R software and they are written in courier new font in blue colour and those statements which are written here in say here black colour Calibri font they are for you understanding.

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So, now, just for the sake of illustration, when we are trying to execute something inside the R software, then how to discriminate that if whether this is an outcome from the R software or it is written here like this, right.

So, if you try to see here this symbol, this is the symbol like greater than sign. So, this is the prompt, that whenever you are trying to type something in the R software, you will always have this prompt and then you have to type `x = 20` after this prompt. So, this means whenever you will see this type of slides in which I am writing the first line

as greater than sign, this will indicate that this is an outcome from the R software and I have copied and pasted it from the R software.

So, x equal to 20 means if when you try to type x equal to 20 in the R software and in the next line if you try to put x and then try to press here enter, enter means this is the key on your keyboard enter key, and if you try to enter, press enter, then you will get here the value 20. So, this is indicating that this is the part, which has to be executed when you are trying to in do something inside the R software.

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Basics
Syntax:
 $y = x * 2$ assigns the value $2*x$ to y .
 $z = x + y$ assigns the value $x + y$ to z .

Outcome over R console:
> $y = x * 2$
> y
[1] 40
> $z = x + y$
> z
[1] 60

Output from the R software.

And similarly, after this if you want to continue further and suppose I want to change the colour of my pen. So, you can see here further I try to write here y is equal to x star 2 assigns the value 2 star x to y. This means when I am trying to write y equal to x star 2 that is x multiplied by 2, right, it is something like x multiplied by 2, right. And suppose if I make any mistake, suppose if I write here 3 and if I want to correct it I can use this pen and I can write down here once again 2.

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Basics

Syntax:

$y = x * 2$ assigns the value $2*x$ to y .
 $z = x + y$ assigns the value $x + y$ to z .

Outcome over R console:

```
> y = x * 2
> y
[1] 40

> z = x + y
> z
[1] 60
```

So, if you are trying to observe to these types of actions while I am a trying to explain you, you can understand that what I am trying to do, right.

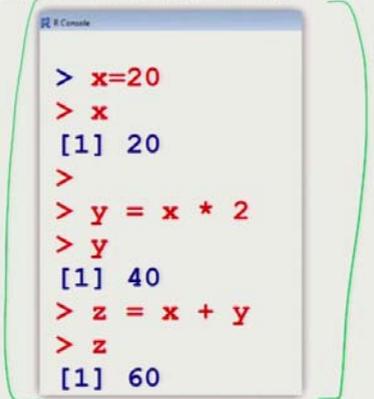
So, this means y equal to x is star 2 and this has to be typed on the R software and the interpretation of this thing is that 2 into x is the value which is assigned to a variable y . And after that if I try to type here z is equal to x plus y , assigns the value x plus y to z ; this means all these things z is equal to x plus y , x plus y and z which are typed in the blue colour courier new font, they are related to the R software.

And whatever is typed here in black Calibri font, like assigns the value and 2; they are your simple expressions which are used to explain you what I want to say. And then the outcome over the R console, now in case if you try to do this thing. So, now, this symbol will indicate that, ok whatever is mentioned here this is copied and pasted from the R software, right.

So, if you try to type y equal to x into 2 in the R software and then you try to type here y and then enter you will get here the value 40. And after that once again in the next line if you try to type here z is equal to x plus y and then if you try to put here z and then enter then you will get here the value here 60. So, this is going to indicate this is the output from the R software, right. So, that is our understanding.

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Basics
Screenshot of outcome over R console



```
> x=20
> x
[1] 20
>
> y = x * 2
> y
[1] 40
> z = x + y
> z
[1] 60
```

The screenshot shows an R console window with a blue title bar. The text is displayed in a monospaced font. Red text represents user input commands, and blue text represents the output. A green bracket on the right side of the console window highlights the entire content area.

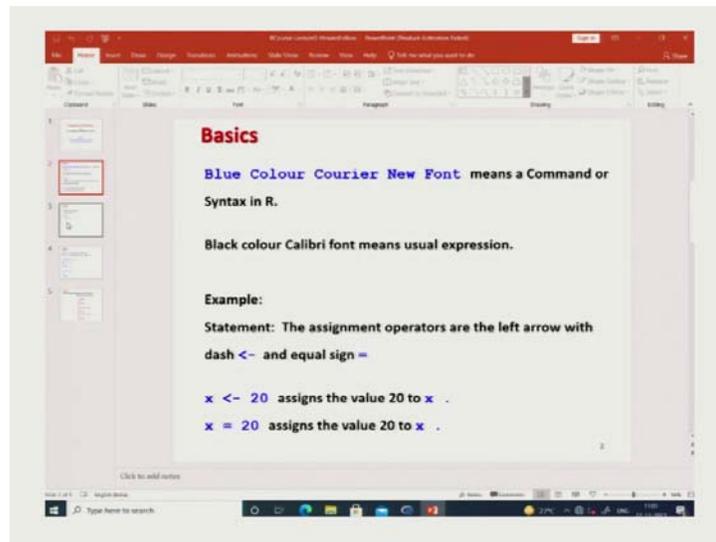
Now, when I am trying to do it on the R software, how it will look like. So, I have executed these commands on the R software that is called R console actually and whatever is the screenshot of the relevant part, this I have copied and pasted here. So, now, what is the advantage? The advantage is that when you are trying to look the same outcome in the screenshot that will give you confidence that whenever you are trying to execute these commands, you should also get the same output.

And it is possible that if you are making a mistake in typing or giving a wrong spelling of the command, the same outcome will not come and then if you try to compare your input with this output which is mentioned here as a screenshot and if you try to compare it, possibly that will help you in finding out that where you are trying to make the mistake. Why? When I have executed the same commands in the R software and I have got the same outcome, why can't you get the same outcome? That is the basic fundamental.

And with this approach, I personally feel that we can remove the problem of not being sitting in the same class and working face-to-face. So, this is equivalent to that in case if you are trying to do something and if you are making a mistake, and if you are asking me, then possibly I can come to you, I can look into your computer and can explain you, ok at here, this point you are making this typographical mistake.

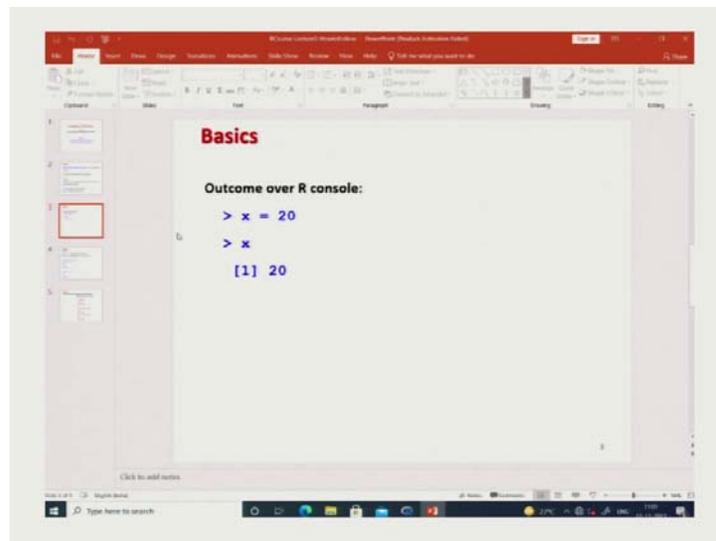
So, that is the same thing which you will get from this screenshot also. So, these are the very simple basic fundamental rules by which we are going to work. Now, after this what I will do? I will try to execute the same thing in the R software also. So, now, means I can show you here that how are we going to work in the R software also.

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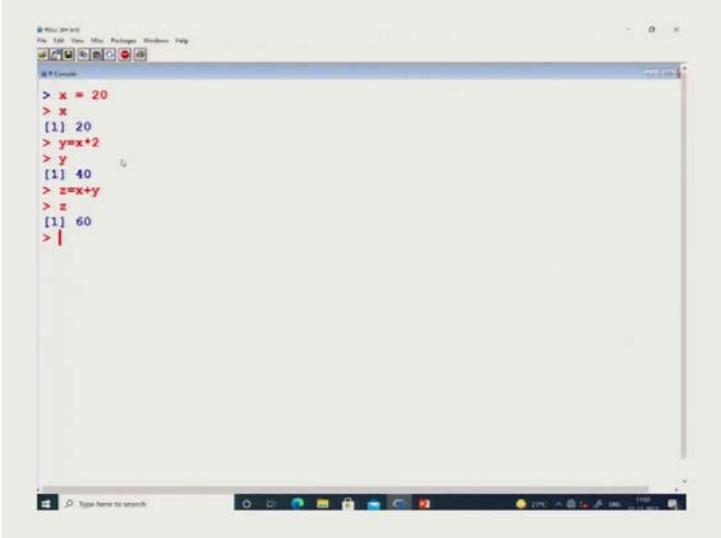
So, you can now see here, so if you try to see here this is the command here.

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For example, if I want to write down here x equal to 20 whatever is written here, then, I can come to here R software and here I can write down here before you, x equal to 20.

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```
> x = 20
> x
[1] 20
> y=x*2
> y
[1] 40
> z=x+y
> z
[1] 60
> |
```

So, you can see here now this is here like this and x is here like this. I am typing here x and then I am simply pressing here enter. And after that, I try to come to the next slide where I have written y is equal to x star 2 and z is equal to x plus y and you can see here that these are the thing where we have this here greater than sign.

So, I can write down here the same thing y is equal to x star 2 and you can see here now the value of y, which is obtained by typing y and then pressing the enter key, it is coming here like this. And after that, if I try to define here z is equal to x plus y. So, I am typing this command before you, and if I try to enter it here and then press z and enter then I am getting here the value 60.

So, now, if you try to see this is the outcome when I am trying to execute the commands on the R software. Well, how it to be done, that we are going to learn in the forthcoming lectures. But here if you try to see this outcome, this is the screenshot which is here. So, now in case if you try to look at this screenshot, possibly it will give you a feeling as if you are working in the R console and that will give you a confidence that whatever is written that whenever you are trying to execute it yourself that should also give you the same outcome, right.

So, with these simple instruction, with these simple rules let us try to hold the hand of each other and we try to move forward. And these instructions are going to work like as our communication language. And this will surely reduce the gap that I am sitting here and you are somewhere else. So, with this simple instruction, I will request you that you try to revise them. And from the next lecture, I will formally start with the course on the R software. So, you try to revise it and I will see you in the next lecture till then, good bye.