**Python Range Functions**

[00:00:00.00] [MUSIC PLAYING]

[00:00:07.78] RYAN AHMED: Hello, everyone. And welcome to this lesson on range function. Range function generates a sequence of numbers, starting from 0 by default, increments set by 1, and stops before a specified number.

[00:00:22.53] For example, if I say range of 5, the function will generate a sequence of numbers starting from 0 up until, but not including, 5. So simply, it's going to generate 0, 1, 2, 3, and 4. Range works well with for loops that we covered before. Since range generate a list of numbers, we can use those numbers to iterate over using for loops.

[00:00:46.88] Here are the key learning objectives of this lesson. Understand the use case of range function and how it could be used with for loops. Learn how to generate a reversed list of numbers. Learn how to change the step size in the range function. So let's head over to our Jupyter Notebook and get started.

[00:01:06.17] [MUSIC PLAYING]

[00:01:13.91] All right, so right now, we are in the Jupyter Notebook titled Python Range Function. OK, so the range function generates integers, starting from 0 up until, but not including, the last number. Let me show you an example.

[00:01:32.24] Basically if I say range of 0, 4, that is going to generate integers from up until, but not including, 4. Basically, I'm going to generate numbers 0, 1, 2, and 3. And range function comes in really handy, and it works quite well with for loops. So the range function generates a list of numbers that are used to iterate over using for loops. Let me show you a quick example.

[00:02:03.51] If you recall, we covered for loop before, and we learned how to loop over an iterable, like a list or a dictionary, for example. What I could do like now use for loops, along with range, to simply generate a series of outputs that looks like that. So for example, if I say, for i in range of 0, 4, and then I say print i, this is going to simply generate number 0, 1, 2, and 3. And this is simply the output that you see in here.

[00:02:37.22] So let me go ahead and move into the code and show you a couple of examples, and how we can leverage the range function, along with for loops, to essentially generate a series of integers. And of course, we can use it in the final capstone project as well. OK, so if you go down to the codes here-- and let me Zoom in a little bit.

[00:02:58.08] The first example is, if I say for i in range 0, 4-- and of course, if you recall with for loops, we add colon at the end, indicating the end of for loop definition. And simply here, I include the body of the for loop. And please don't forget the white space or indentation that we have here.

[00:03:19.09] So if I say, for i range 0, 4, and then I say print i, and you press Shift and Enter, simply what you get is numbers 0, 1, 2, and 3. So you go up until, and not including, 4. All right, what if you, for example, wanted to specify only the last element? So I don't need to specify the starting index.

[00:03:44.37] To do that, all I need to do is to say for i in range of 4, print i. And simply, range is 0 indexed, meaning that numbers by default is going to start at value of 0. So if I say, for i in range of 4, print i, you press Shift, Enter, you will simply get the exact same output as we got here when I specifically specified the starting point or the starting number.

[00:04:12.32] Well, what if I wanted maybe to perform a step size? For example, I wanted to only print values that are at even places, or maybe odd places. Well, I can do that easily. So I can say for, i in range 0, 4, 2, basically what I'm saying is, please go ahead and print out numbers starting from 0 up until, but not including 4, with a step size of 2. So if you press Shift, Enter-- here we go, you will simply get 0, and then 2.

[00:04:47.67] OK, let me show you another example. Let's assume that I have two lists. The first list contains company names.

[00:04:55.84] So here, for example, I have Company A, B, C, and D. The other list contains company revenues. So here, I have $600,000, $900,000, $1 million, and $1.1 million as an example. And if you press Shift and Enter, simply, I'm going to define these two lists.

[00:05:11.55] What I could do next is, I want to simply print out the company name, along with its corresponding revenue. So I wanted to print out Company A versus $600,000 as an example. To do that, I can leverage the print function, which we learned how to do that before. And if I say, print the revenue of curly braces-- which is a placeholder for us, is equal to 2, curly braces .format.

[00:05:40.11] And here, I'm going to say company\_names of 0, and then company\_revenues of 0. So if I press Shift, Enter, you will simply get the revenue of company A is equal to $600,000. And basically, what I've done here is I was able to print out two elements in two different lists using one single line of code.

[00:06:02.00] Well, what if I wanted to repeat that operation multiple times? To do that, now I can simply leverage the for loop, along with the range function, to generate a series of integers. For example, we're going to say 0, 1, 2, and 3.

[00:06:17.05] So here at these locations, now I can replace them with a variable i index. And now I can print out various companies, along with their corresponding revenues. Let me show you how we can do that.

[00:06:30.91] So first, I'm going to obtain the lengths of company names. So we learned how to do that here before. I'm just going to obtain the lengths of the lists. And here, I simply have four elements contained in my list. And now, that's where range function comes in handy.

[00:06:48.13] So here, I'm going to say, for i in range of length of company\_names-- basically for i in range of 4, every time I'm going to generate a temporary value for i. First one is going to be 0, and then 1, and then 2, and then 3. And that's what I'm doing here. I'm going to say, print index equals to-- that is going to be the i.

[00:07:10.14] And then I'm going to say the revenue of the company is equal to the company revenue. And that's what I'm passing along here. I'm going to say .format Here, I'm going to print out the company names of index i and that will change with every iteration of the for loop. And I'm going to print out the company revenues associated with it as well.

[00:07:29.73] So if I Shift, Enter-- here we go, here simply, the first iteration index is going to be 0. And this is simply the output, the print operation. And then for the second iteration, I'm going to have index equals to 1. I'm going to print the company revenue for B, and then with index 2, followed by index 3 afterwards.

[00:07:49.23] OK, finally, what I wanted to show you is, let's assume that I would like to print only companies that are contained within an even index, only within the list. To do that-- and I showed you that before, I can say, for i in range 0, length of company\_names, which was 4. And then I'm going to add an optional parameter in here, and that is going to be the step size. It's going to say step of 2. I'm going to print the index, and I'm going to print the company name, along with the revenue.

[00:08:20.91] So press Shift, Enter. Here we go. You will simply get only two print lines in here, and that is going to be the company at index 0 and the company at index 2.

[00:08:34.14] And that's it. That's pretty much all I have for this lesson. I hope you enjoyed it.

[00:08:38.88] In the next lesson, we're going to have our practice opportunity. So please go ahead. I want you to go through practice opportunity. Read it. It's quite interesting.

[00:08:47.46] And then I want you to add your solution in here. And then I'm going to provide you with a detailed video explanation showing you the solution and details. So please stay tuned. Best of luck, and I'll see you in the next lesson.

[00:08:59.04] [MUSIC PLAYING]