**Python Lists**

[00:00:00.00] [AUDIO LOGO]

[00:00:08.41] RYAN AHMED: Hello, everyone, and welcome to this lesson on Python lists. In Python, lists are used to store multiple items in a single variable. These items are ordered and have a specific index. Python lists are powerful because you can contain a collection of items with different data types in them. For example, in a single list object, you can have integers, strings, and floating points.

[00:00:33.91] Lists are defined using square brackets and elements are separated by commas. Here are the key learning objectives of this lesson. Define Python lists and understand their benefits and use cases. Use indexing to access specific elements in Python lists. Perform lists slicing to access a range of elements within the lists. So let's head over to our Jupyter Notebook and get started.

[00:01:02.36] [AUDIO LOGO]

[00:01:09.59] All right, so right now, we are in the Jupyter Notebook titled Python Lists. As a quick reminder, we use Jupyter Notebooks throughout the entire course, because we can include everything we need in one place. This includes slides, code scripts, output generated from that code. We can also include comments, practice opportunities, and the solution of those practice opportunities as well. So you can share the notebook with other people or with your colleagues at your company easily and efficiently.

[00:01:44.16] So let's go ahead and get started with our topic today. And that is going to be Python lists. In Python, a list is a collection of items that are ordered and have a specific index. Lists are defined using square brackets, and they are separated by commas.

[00:02:03.76] So let's go ahead and define a list containing five companies in US, Asia, Europe, and Africa. And simply, that's how you define a list. You provide a name to that list. You say, my\_companies for example, equals to, you declare or define a Python list using these square brackets that you see here, and then you list elements within that list separated by commas. For example, here, I listed Apple, and then I listed Samsung afterwards, followed by Alibaba, Novo Nordisk, and Naspers. Please note that Apple and Samsung-- they simply manufacture electronic devices, such as phones and computers. Alibaba Group is a Chinese multinational company that specializes in tech, e-commerce, retail, and internet. And Novo Nordisk is a Danish multinational pharmaceutical company. And finally, Naspers is an African internet and tech company that is headquartered in Cape Town, South Africa.

[00:03:13.86] So an important point when you define a list is that every element in a list has its own index. So the first element in the list has an index of 0. So Apple has an index of 0. Samsung has an index of 1. Alibaba, index of 2. And then Naspers at the end, has an index of 4.

[00:03:36.28] So the next topic that I wanted to show you is regarding list indexing. So if you would like to access specific elements in a Python list, we access the elements using the index. For example, if I would like to access, let's say, Apple, you say my\_companies-- and that's the name of the Python list-- you open a square bracket. And then you specify the index, or the location of that element within the list.

[00:04:05.03] So for example, Apple has an index of 0. I know that might sound a little bit confusing at first. But trust me. You will get used to it. You just say my\_companies[0], of 0 and then you would be able to access Apple, which is the first element in the list. The second element, which is Samsung, has an index of 1. You say my\_companies, square brackets, and then you specify the index or the location. And then you are able to access the second element, which is Samsung. If you want to access the last element-- so the last element here in the list has an index of 4-- so you say my\_companies[4], and then you will end up with Naspers.

[00:04:45.73] So the last topic that I wanted to cover before we head over to our code is lists slicing. So in lists slicing is used to obtain more than one element from a Python list. The slicing operator, if I say n, colon, m used to obtain elements that starts from index n up until, but not including the index m. Again, I know that might sound a little bit confusing at first. But you will get used to it. So let's assume that I wanted to access, or slice my list, which is my\_companies, and I wanted to obtain Samsung, Alibaba, and Novo Nordisk, for example.

[00:05:27.79] To do that, you specify the name of the list. You say my\_companies. You open square brackets. You specify the index of the first element you would like to access. And Samsung here has an index of 1. That's why you say 1. And then you say colon. And then afterwards, you add the last index you are interested in. So if you say 4, you essentially get elements starting from index 1 up until, but not including 4. So you get elements with index 1, 2, and 3. And that's why here, I got Samsung, Alibaba, and Novo Nordisk afterwards.

[00:06:06.52] OK. All right, so let's go ahead and jump into our code and show you all of these concepts in details. All right, so let's go ahead and define our list. So I'm going to say my\_companies equals to, I opened square brackets, and then here I specify Apple, Samsung, Alibaba, Novo Nordisk, Naspers. And then to run or execute this, you just press Shift and Enter at the same time on your keyboard. And then you will end up with the list here. OK?

[00:06:37.96] Next, if I would like to check out the data type for my companies, if I say type, and you open parentheses, and then you say my\_companies, and then you run the SEM, then you will get the type. And that is going to be lists. Please note that up until this moment, we know about integers data types. We also learned about notes. We covered strings. And right now, we introduced a list.

[00:07:08.09] Next, I can also define a list that contains multiple integers and floating points as well. So let's assume that I wanted to obtain a list that contains all the revenues from the previously mentioned companies in 2021. And I want to list them as well, in billions of dollars. So for example, I wanted to get the annual revenue for Apple in 2021, and then the annual revenue for Samsung in 2021, Alibaba, and so on. To do that, I'm going to define another list. I'm going to call it my\_companies\_revenues equals to-- I open square brackets. And then I listed the revenue for Apple. And that was $365 billion.

[00:07:56.63] And please note that these numbers are just an approximated numbers. Samsung is around $240 billion. Alibaba is $109 billion. And then Novo Nordisk is $22 billion. Naspers is $5.9 billion. So to run or execute the SEM, you just press Shift and Enter. And you should get the other list that is going to be my company's revenues. OK.

[00:08:18.17] Now, let's go ahead and show you how we can access elements within a specific list. So for example, if I have again, my\_companies, which is listing all the companies I'm interested in-- if I say my\_companies and open a square bracket, and then I obtain 0, and you run the SEM, you will get the element in the index of 0, which is Apple.

[00:08:41.57] I want you to go ahead and change that number and maybe put let's say, number 2 for example, and press Shift-Enter. And then you end up with Alibaba. And that's the element in the third location, because we start with index 0, 1, and then 2.

[00:08:59.00] Let me show you list slicing. As I mentioned before, we use the column operator to slice specific elements from a Python list. So if I say my\_companies, and then I open square brackets, and then I say 1 colon 4, and you run the SEM, basically what you get, you will get elements starting from index 1 up until, but not including index 4. So you get 1, 2, and 3. And that's it. And that's why here I got Samsung, Alibaba, and then Novo Nordisk afterwards.

[00:09:32.51] Well, what if we wanted maybe to obtain elements starting from index 2 up until the end of the list? The syntax to do that is, you say my\_companies, square brackets, you specify the first index, which is 2, and then you add colon. And that's it. So basically when you say colon, that means everything. Just get me elements starting from index 2 and everything onwards. Just get me the rest of the list.

[00:10:02.09] You press Shift and Enter. Here we go. You got Alibaba, and then you got everything afterwards. Here, is index 0, 1, 2. So I got Alibaba and then I got everything afterwards. OK? All right.

[00:10:16.10] And then finally, if I wanted to obtain or print out all the elements from start to end, you just say my\_companies, of colon, and again, if you press Shift-Enter, you will get all the elements in the list. And if you would like to obtain the length of the elements in my list, like how many elements in total, you can just say len, which stands for length, of my\_companies. And you press Shift-Enter. And then you will end up with five, because I have five elements contained in my Python list.

[00:10:46.61] And that's it. That's all I have for this lesson. I hope you enjoyed it. In the next lesson, I'm going to show you the practice opportunity along with the solution of the practice opportunities as well. Please stay tuned. Best of luck. And I'll see you in the next lesson.

[00:11:00.41] [AUDIO LOGO]