**Python Dictionaries Practice Opportunity Solution**

[00:00:08.82] RYAN AHMED: Hi, everyone. And welcome to this Practice Opportunity Solution lecture. I hope you have been able to solve the practice opportunity. Let me go ahead and walk you through the solution.

[00:00:19.39] First, let me go through the question. So assume that you work as a financial analyst at a pension fund. And you decided to list the names of your three top favorite tech stocks along with their prices in a Python dictionary. First, I want you to define the Python dictionary. Feel free to choose any tech stocks you'd like. You can, of course, use Google or Yahoo Finance to obtain the daily prices of these securities. And then I ask you to calculate the average stock price listed in this dictionary. And then I want you to assume that you wanted to add two more stocks to the previously created dictionary. I want you to update the previously defined dictionary and also calculate the new average using two different methods.

[00:01:10.38] So let's go ahead and show you the solution. So what I'm going to do is I'm going to define a dictionary. I'm going to call it technology\_stocks. So you define a dictionary using curly braces. So I'm going to create curly braces. I'm going to add quotation marks. And here I'm going to say, Apple colon. And I just went to Google. And I just looked up the price of Apple as of today. And of course, this could change, depending on when you're watching this course. And you can say just $152 US, as an example.

[00:01:49.06] And then to separate items within a Python dictionary, you add a comma. And then you add the second item. The second item here, I selected a company called SAP. And it's one of the largest tech companies in Europe. And then you add colon, and then you're going to say, let's say, $112, for example. That was the US equivalent price at that specific date.

[00:02:13.88] And then I'm going to add a Chinese tech company. It's one of the largest companies as well in China. It's called Tencent Holdings. So I'm going to grab that. So I'm going to say Tencent Holdings. And then I'm going to add colon, and then I'm going to add the equivalent US dollars price here, $38. And then I'm going to say, print tech\_stocks. Again, if you press Tab, that is going to autocomplete for you. If you press Shift-Enter, here we go. Now I have been able to define my Python dictionary.

[00:02:43.88] Next, I ask you to obtain the average. So to obtain the average price for all these different three stocks, I simply need to sum up $152 plus $112 plus $38, and then divide by the length of the dictionary. Divide by the number of elements that I contain in here, which is simply three. To obtain the number of elements, all you need to do is to say, len. You open parentheses, and then you specify the technology\_stocks. We press Shift-Enter, and then you'll be able to get three items are contained in my Python dictionary.

[00:03:23.05] To calculate the average, all you need to do is to say, I'm going to grab the technology\_stocks. I'm going to open square brackets. I need to obtain the first value here, which is 152. To obtain elements from a Python dictionary, we obtain them using their keys. So the Apple is the key. 152 is the value associated with that key. So here if I say, please get me Apple, and you press Shift Enter. Here we go. Now I got 152.

[00:03:52.90] So I'm going to get Apple, and then I'm going to say, plus. I'm going to say, again, technology\_companies-- technology\_stocks. You open square brackets. You add quotation marks. And then you say SAP. That will be the second element. Then you say plus. You grab, again, technology\_stocks. You open square brackets. You add quotation marks. And then I'm interested in Tencent Holdings. Again, if you press T-E-N Tab, that is going to autocomplete for you. So if you press Shift-Enter right now, here we go. Now we end up with 302. And this is simply 152 plus 112 plus 38.

[00:04:27.79] But I wanted to calculate the average, right? So I'm going to divide that number by the three or the length of tech stocks. To do that, I'm going to add parenthesis here. I'm going to add parenthesis here as well at the start of my calculation. I'm going to divide that by the length of my tech stocks. Press Shift-Enter. Here we go. Now we end up with $100 for average. And this is simply the average price for my three tech stocks that I selected in here.

[00:05:01.88] Next, I ask you to add two additional stocks. And feel free to choose any new tech stocks you'd like to. So for example here, I'm going to add maybe Microsoft and Samsung. Again, please feel free to choose any stocks you like. So again, I'm going to say, I'm going to grab my tech stocks. And that was my previous dictionary that I had before. And then to add additional elements to an already existing Python dictionary, you specify the name of the existing Python dictionary. And that was my technology\_stocks.

[00:05:34.61] You open square brackets, and then you add the name, which is the key first. So here I'm going to say, Microsoft, Microsoft. And then you say, equals, and then you specify the price. So here I said, it's 250, for example. And then I'm going to, again, add an additional element. That would be my second stock I would like to add. And here I selected Samsung. And then you say, equals. And then here I got the price, and that was $41 as we were recording this video.

[00:06:04.49] If you press Shift-Enter right now, and if you want to check out what's in my technology\_stocks dictionary, here we go. Now we ended up with Apple 152, SAP, Tencent Holdings. And please note that these were the three elements when I initially defined my Python dictionary. And these are the two additional elements that I added in here.

[00:06:25.64] And then, finally, I want you to simply calculate the new average. So please note that I asked you to do that using two different methods. So the first method, that was the basic one that we have done here. I was going to sum up all the elements and divide by len of tech stocks. I'll copy that and paste it here. But now I need to add two additional elements. So what I could do here is I can make it a little bit better at readability. So just press Enter. And then I'm going to press Enter here.

[00:06:57.68] And I'm going to here add a plus sign, and then press Enter. I'm going to add, again, technology\_stocks, open square brackets, and now I'm going to add Microsoft. Again, Tab. That is going to autocomplete for you. I say, plus. You press Enter. You add technology\_stocks. And now I'm interested in adding Samsung in there-- again, S-A-M autocomplete. And then right now, that is going to calculate the new simply average for me. Press Shift-Enter. Here we go. I ended up with 118.6.

[00:07:29.63] And please note that this strategy here requires a lot of code and requires you writing every element that you have in the Python dictionary. And that could be maybe like hundreds, or maybe thousands, for example. Alternatively, what I could do is I can simply say, if I grab my technology\_stocks, and if I say, .values, and you open parentheses, and you press Shift-Enter, basically, what you're getting here, you're going to simply get all the values associated with my Python dictionary. And that's pretty powerful because I don't need to go and access each of these values individually. I can just say, grab my Python dictionary, say .values, and you end up with all the values in here, which is pretty powerful.

[00:08:14.73] So what I could do is if I say, well, could you please go ahead and sum up all these values for me? If you say, sum of technology\_stocks.values, and you press Shift-Enter, here we go. Now I have been able to sum them up. So I summed up simply 152 plus 112 one plus 38 plus 250 plus 41. I ended up with 593. So right now I can simply grab that. And if I say, divide this by the length of my technology stocks and press Shift-Enter, here we go. Now I ended up with the exact same value. And that was 118.6. And of course, this code is a lot more dynamic. And it's a lot more efficient compared to the previous method.

[00:08:58.40] So that's it. That's all I have for this lesson. I hope you enjoyed it. And see you in the next lesson.