**Conditional Statements**

[00:00:00.49] [MUSIC PLAYING]

[00:00:08.34] RYAN AHMED: Hello, everyone, and welcome to this lesson on conditional if-else statements. In Python, conditional statements or if-else statements are used for decision making. If-else statements contain a body of code which runs only when the condition given in the if statement is true. If the condition is false, then the else statement will be executed instead.

[00:00:33.82] Here are the key learning objectives of this lesson. Understand condition statements for if-else conditions in Python. Develop a simple password authentication application. Develop a Python application that can evaluate stocks and indicate whether they are overvalued, fairly valued, or undervalued. So let's head over to our Jupyter notebook and get started.

[00:00:56.94] [MUSIC PLAYING]

[00:01:04.78] All right. So right now we are in the Jupyter notebook titled Conditional Statement or If-else Statements. So in Python, if-else statements are used for decision making. This is simply the syntax to write if condition in Python. You simply say if, and then you specify the condition in here and then you add colon. Afterwards, you add that indentation or whitespace here, and then you write the statement one and simply if the condition-- or the if condition is true, statement one will be executed.

[00:01:44.75] So statement one simply is the body of the if condition. If that condition is false or if it's not satisfied, simply not true, the else part is going to be executed. And the syntax is pretty simple as well. You just say else, you add colon here, and then you write the body of the else part. That will be statement two. Simply if the condition is not true, statement two here will be executed instead.

[00:02:13.05] And of course, I have here indentation as well for the body of the else part of the if-else statement. OK. So let me show you how we can do that in code. All right. So let's assume that we would like to compare the revenues from two companies. These are company A and company B. And here I'm going to simply define revenue A. I'm going to put 2,000 in it. I'm going to define another variable, revenue B, and then I'm going to put 2,000 in it as well.

[00:02:42.82] And this is the syntax to write an if-else statement. I'm going to say if you find revenue for company A greater than revenue B, once that condition is true-- please note that there is colon here at the end and there is an indentation or space that has been created indicating that that would be the body of the if condition. If that condition is true I'm going to print this statement to the screen. I'm going to say, company A generates more revenue compared to company B.

[00:03:13.44] And then I'm going to say, else if you find revenue A less than revenue B-- so simply if that condition here is not satisfied, I'm going to check on another condition. I'm going to say, is revenue A less than revenue B? If this answer is true, if that condition is satisfied, I'm going to print company B generates more revenue compared to company A.

[00:03:38.04] And then if none of these two conditions are satisfied, then I'm going to do the else or execute the else part of the if-else statement, and then I'm going to say that means company A generates more-- I'm sorry. Equal revenue compared to company B. So let's go ahead and test it out. Let's assume that I'm going to put in company A, for example, let's say 2,500, and let's test the first part of the if-else statement.

[00:04:04.05] If company A generates 2,500 and company B generates 2,000-- and if I run this stand right now, here we go. What you get is simply this part of the if-else statement is the only part that has been executed, which means company A generates more revenue compared to company B because 2,500 is greater than 2,000. And another key important as well, consideration that I would like to show you, is when we write if-else statement and we would like to validate our code, we want to make sure that we test the code by validating every single branch in the if-else condition.

[00:04:44.69] Meaning that right now I was able to test that this part of the if-else statement is functioning or working correctly. What I wanted to do right now is I wanted to test the second part. So what I'm going to do is I'm going to set company revenue A to, let's say, maybe keep it at 2,500. And then I'm going to change company B. I'm going to change it to 3,000. So that means revenue A is less than revenue B.

[00:05:12.18] If you run it right now, if you press Shift-Enter, here we go. What you get is simply this part here has not been executed, so this has been skipped. And only this part of the if-else statement has been executed. Why? Well, because revenue A is less than revenue B. 2,500 is less than 3,000, so this condition is the only condition that was satisfied and that's why I printed to the screen company B generates more revenue compared to company A.

[00:05:44.01] So now I was able to test the first two part of the if-else statement. Finally, I'm going to set both of them to be equal to each other. I'm going to say 3,000 and 3,000, and then you press Shift and Enter. Here we go. What you simply get is, well, this condition is not true, so I'm going to skip the body of the if. This condition is not true so I'm going to skip the body of the if-- of the else-if here.

[00:06:09.79] And then finally, because none of these two have been satisfied, well, the else part is going to be executed. And now I'm just going to print the last statement, and that would be company A generates equal revenue to company number B. So the key question is, OK, what's the point of if-else statement? Well, right now I added some level of intelligence in my code.

[00:06:30.25] Now I added some level of decision making. For example, I can use if-else statement to buy or sell stock, so securities, based on a specific condition. And then you can add some logic, some intelligence in your code. So let me show you another example. Let's assume that I would like to develop a simple if-else statement that can get a number from the user and indicates whether that number is even or odd.

[00:06:58.73] So if I take the number, let's say x, and if I take the number and divide it by 2, and if that number was, in fact, divisible by 2-- meaning that that number was even. And if I take that number and divide it by 2 and I got a remainder-- let's say 7, for example, divided by 2. I got, let's say, 3.5. Because I have a remainder here, that means that this number was odd. And that's how I'm going to write my if-else statement.

[00:07:30.56] First, I'm going to input data from the user. I'm going to ask the user to enter an integer that could range anywhere between 1 and 1,000. And then I'm going to cast that into an int format in data type here by using the int. If you recall, we have done that before. And then I'm going to put that data in a variable, call it x.

[00:07:51.92] And then next I'm going to say, if you find-- if you take x and you divide it by 2 and you obtain the remainder so that simply a percentage sign is the mod. It's used to calculate the remainder from the division operation. So if you take x and you divide it by 2 and you obtain the remainder and the remainder was equal equal zero, that means I do not have the remainder. That means the number was divisible by 2. I'm going to print number is even, else that means number is odd.

[00:08:21.80] So let's go ahead and test it out. And of course, we need to test every single branch in my if-else statement. If you press Shift and Enter right now, here we go. We will see that please enter an integer from 1 to 1,000. So if I say, let's say for example 20, and you press Enter, well, you get number is even. Let's go ahead and test it out.

[00:08:41.69] Simply what we have done here is we took 20 and then we divided 20 by 2, and then you got simply 10. And I didn't have a remainder here in this division operation, so the remainder was equal equal to zero. And that's why I printed number as even, and that's what I got here on this tree. Let's go ahead and test it out. If you press Shift-Enter, and maybe I put number 7, which is an odd number, and you press Enter. Here we go.

[00:09:10.83] Now we got number is odd. Again, simply you took 7, you divided it by 2, and then you got 3.5. So I have a remainder in this division operation. So that means this condition is not true, wasn't satisfied, so I skipped the body of the if, I did not execute this code, and I executed the else statement, which was number is odd. And that's what I got here on this tree. OK.

[00:09:39.03] Finally, I wanted to show you another example, and I wanted to develop this simple password authentication code. Pretty simple. I wanted to simply ask the user to insert their username and also enter their password, and I wanted to make sure that the access to specific part of the code is granted only if the username and password matches what I got in the system beforehand.

[00:10:07.08] This is simply the username that I have. I just added my name here. Please feel free to add your name as an example here for the username. And this is a password. It was 123$ABC as an example. So what I'm going to do is I'm going to ask the user to enter their username. So I'm going to say input, open parentheses, Welcome to the bank, please enter your username. I'm going to put that data in a username.

[00:10:31.49] Next I'm going to say input, please enter your password. So I'm going to get that data. I'm going to put it in a password. We learned how to do that many times in the past. And then what I'm going to do next is I'm going to say, OK, if you find my username, which is the data that the user will enter, equal equals to RyanAhmed, for example, and-- and this is simply and as a logical operator. It basically generates true if both conditions are true coming into the condition here.

[00:11:03.54] So basically this part has to be satisfied and also password has to exactly match the password that I have recorded in the system, and that was 123$ABC. If these two conditions are true the body of the if is going to be executed, and then I'm going to print access granted. Else print access denied, please try again. Let's go ahead and test it out. If you press Shift and Enter, here we go. Welcome to the bank, please enter your username.

[00:11:33.19] So if I say, for example, let's say Ryan only as an example. And you press Enter, and then you enter the password. And maybe I add 123$ABC as an example, and you press Enter. Well, you will get access denied, please try again. And that makes sense, well, because I did not exactly enter the username listed in here. I only entered, for example, Ryan, and here it has RyanAhmed as int.

[00:11:59.23] If you run it again, if you press Shift-Enter and you say, welcome to the bank, please enter your username, and you try it out and you say the exact name-- for example, you press Enter, then enter the password. You say 123 and then you add a dollar sign and maybe add ABC as an example and you press Enter, here we go.

[00:12:17.17] Basically because I insert exactly the same values for the username and the password-- so this condition was true and this condition was true, so both of them generated true. So the body of the if is going to be executed, and that's what I got here. I got access granted. All right. So that's it. That's simply all I have for the condition and statement or if and statement. I hope you enjoyed it. In the next lesson, we can have our practice opportunity, and that is going to be a little bit advanced.

[00:12:49.45] So please go ahead, I want you to do a quick check. Simply I want you to review some of the concepts that you covered before, which is the dividend discount model. And I want you to go ahead and write code to execute all these different tasks, and then I'm going to show you a detailed video explanation of my proposed solution. So please stay tuned. Best of luck, and I'll see you in the next lesson.

[00:13:14.11] [MUSIC PLAYING]