Transcript: Interactive Programs

>> Now let's take a look at interactive programs using standard input. Programs generally need user input. Standard input comes from the keyboard. We could also read in files which we will do later. The Scanner class in the Java class library provides methods for reading input. We could read in strings, ints, doubles, and so on, and we're gonna begin by reading in ints.

We need to import the scanner into the program by placing the following line at the beginning of the file. It says import java.util.Scanner;. Scanner is the class and it's coming from the java.util package. And and once we import the scanner, we can setup the scanner object. We can create one to read imput from various sources which include the keyboard which is System.in.

So we're gonna create, a Scanner object, and we wanna create it on System.in. Here's the, statement that does this. We say Scanner scan, and scan is just a variable name, we could use anything there, is a new Scanner System.in. The new operator creates a scanner object. And once it's created, we can use it to get input.

For example, nextInt retrieves the next integer value. We would create a variable, let's say number items. Say int number of items equals scan.nextInt();. And scan there and and that statement is the name of the scanner we set up above here. So let's take a a look at the difference program that we've got here.

So on line 1, we import the scanner. We say java.util.Scanner and this is public class Difference. We have our main method, and then on line 7 and 8, we, we declare number1, number2 and difference. And then line 8 is where we create the scatter object on System.in. Remember, System.in is the keyboard.

And we're gonna call it userInput. So now we need to get input in from the keyboard. So we do a System.out.print, enter the first number: space. And then next we say number equals userInput.nextInt, nextInt. And notice that userInput is just the name of the scanner we're calling and it's gonna scan in a an int from the keyboard.

And, there we're going to print out. Enter the second number and, then we'll set number 2 equal to userInput.nextInt(). We'll calculate the difference in an if statement, and then eventually we'll print out the differences difference followed by a period. So, let's run this in the debugger. We're gonna set a breakpoint in line where we create the Scanner.

So there's our scanner over in the variables tab and it's it's a scanner object on a system.in. Next we say, enter the first number. Notice we use a print statement for that and so it left us on that same line for us to enter enter a number. So, now I'm gonna enter the number 123.

And then we're gonna step. Says enter the second number and let's enter in this case 220 or 234 let's say, 234. So now we're at an if statement and it says if number 1 is greater than or equal to number 2 we're gonna subtract a a number 2 from number 1, otherwise we'd go down to the else which is what we're going to do here since number 1 is not greater than number 2.

So let's do that, we'll step and we're down at the else, we do the subtraction and we get difference. And then we're going to print out the difference is. And that's that's as simple as it is, reading in from the keyboard there, one more step, and the program ends.

Now, let's try this again using the canvas. I've, I've created a canvas, it's and it's already in the, file here. It's a difference canvas, and we'll show you how to do that as well. And here, it's this third button here. We've run, we've run in debug and then this is run in Canvas.

So it opens up a canvas and it's just gonna show us a little more detail or I guess, a more, visualization, of our program than just the debug tab alone. So when I step, there's the scanner, and it's gonna show what we key in, as, as we key it in, and it's scanned.

Notice the, scanner buffer here, we're at position 0, and it's just filled with zeroes. So we enter the next number, waiting for input. So again, let's, let's enter 3452345. And we step. And this time let's say, let's enter there's our second number. Let's enter just 200. Okay, and you can see up here in the scanner, it's coming in here at one step you'll see it there, and so up here in the scanner we got, there's the 2345 that came in followed by the line fee, which was my return.

On Windows you see a \r and a \n. And then here's the 200 I just keyed in. And now we're about to enter the if statement and in this case, number1 is larger than number2. And so we create the difference and then we print out the difference and we're done again.

So last step here, I'm gonna show you how to create this canvas. I'm gonna close this one, and I'm gonna start in debug mode. But if you don't have a Canvas, if this is your own program, you could click the run in Canvas and it would open a new canvas.

And you would see this right here. If you ran in Canvas, you would see just an empty canvas, ready to be saved. so I'm gonna step. And the idea is you have to step til you see the objects, objects have been created over in the debug tab, and then you can just drag them onto the canvas.

And so there, here's our scanner. It's sitting at again, position 0. And then I'm gonna step some more. It says enter the first number, and let's enter, 25, maybe. Let's go ahead and enter the second number, [BLANK AUDIO] and let's enter, for that, let's enter 56 perhaps. And then we're go ahead and step again and we're gonna go ahead and let it create the difference here.

And now we got all three of these variables over in the Variables tab of the Debug pane and so I'm just gonna drag them on to the canvas. And we can get them all lined up here. Make look nice. And one more. And then when we get them all lined up like that, we've got it.

And, at this point, we have everything we want on here and, so, we could just save the canvas. And if you try to close it at this point, I'm gonna close it. And, it's gonna prompt me to save it. In this case, I'm not gonna save it, cuz I've already got one just like it.

So, but you would save it, if this is your first canvas. I'm just gonna just, discard the edits. And then, you could run the program, instead of running debug, we can just run in Canvas. And it'll just pop the Canvas up, and then you can hit the Play button.

You will actually run through your program. Here we're waiting for input. Let's give it two three four, waiting for the next one. So it's stepping for us here, and it computes the difference and it ends. After the program ends it holds the canvas open and the state. Although the program is essentially ended where we're keeping this available where you can see it.

But, simple to use a canvas just drag things out that you wanna see on there and we'll we'll be using this as we go forth.