

5.3: The for Loop in Python Walkthrough

In this walkthrough, we will be demonstrating the use of the for loop within Python. We will work our way through 2 examples, and then there are some questions for you to complete.

As we saw in the narrated PowerPoint, the general form of the for loop is:

for <<variable-name>> in range(<<range-conditions>>):

# code to loop

Let’s start by looking at a minimal example. In this case we are simply going to print the first 5 numbers (i.e. from 0 to 4).

Enter the following code in your Python file:

for i in range(5):

print(i)

Your code should look like this:



When we run this section of code, we should simply get a list of numbers output – from 0 to 4:



This is a minimal example of a for loop, where we are simply printing numbers. However, this is not particularly useful, so let’s look at another example where we are making use of the looping variable to produce an output.

We are going to write a for loop which will allow us to calculate the sum of a list of numbers – for this example, the sum of the first 5 numbers. Before we write our code, let’s think about the outcome and what our answer should be when we test the program is working. If we want to calculate the sum of the first 5 numbers, we need:

1 + 2 + 3 + 4 + 5 = 15

Therefore, when we run our program, we would expect the output to be 15.

Now we are going to think about the pseudocode for our program. We will have the following steps:

ASSIGN variable sum to 0

FOR 5 iterations:

ADD iteration number to sum

OUTPUT sum

We are going to start by defining a variable which is called sum and assign a value of 0 (as we don’t want this value to impact the final outcome):

sum = 0

Now we need to calculate our sum using a for loop:

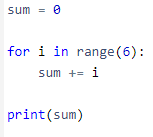
for i in range(6):

sum += i

Finally, we have to output the answer:

print(sum)

Your code should be as follows:



Now when we run the code, we get the anticipated outcome:



We can extend this further, by adding an input function, which will allow us to get a number from the user and print the sum up to and including that number. Adapt your code as follows:

number\_to\_sum = int(input("Please enter a number: "))

sum = 0

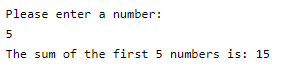
for i in range(number\_to\_sum + 1):

sum += i

print("The sum of the first", number\_to\_sum, "numbers is:", sum)

Now when we run this program, we get an output which requests us to enter a number, then sums it accordingly. You will notice that in the code, we have increased the number to iterate to by 1 – this will allow for the fact that the range function starts at 0 and stops before the required number.

We get the following output when this code is run:



Now that you have done these examples, complete the following exercises to practice your skills.

1. When we started creating functions, we wrote a say\_hello\_world() function. Using a for loop and this function, write a program which will run the say\_hello\_world() function 10 times.
2. Write a program which will calculate the product of the first 5 numbers. Make sure that you test your program is working as you would anticipate
3. Adapt your answer to the previous question to allow the user to enter where the program should stop iterating (similar to what we did in our sum example)