
# IIT Madras

## ONLINE DEGREE

**Programming in Python**
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**Types of Functions**

Hello Python students. Let me start this lecture with a question. When is the first time you used a Python function in this particular course? And now most of you must be thinking what kind of a question is that? This entire week is about functions. So, obviously you used function first time in the first lecture of this particular week. But then I will say you are wrong. This is not the first week or not the first time you have seen Python functions.

The correct answer for that question is first week, first lecture, first ever line of Python code you wrote was a function. Confused? Let me explain it this way. We all started writing a Python programs using print. So far, we are referring it using various different names like print command, print statement, or just print and so on. But the most accurate term for print is function. Print is a function. That is why I said we all have used function in week 1, lecture 1 the first ever line of Python program we have written.

Now, the next question is unknowingly is that the only function we have used so far or are there more functions which you use without realizing that it is a function and the answer is yes, we have used many different types of functions even before we started this week. Only thing is we never referred those as functions. Therefore, in this particular lecture, we will go back to few of those functions and try to categorize all such functions we have used so far into 4 different categories and then we will see what is the difference between all these types of function. Let me start with some examples.

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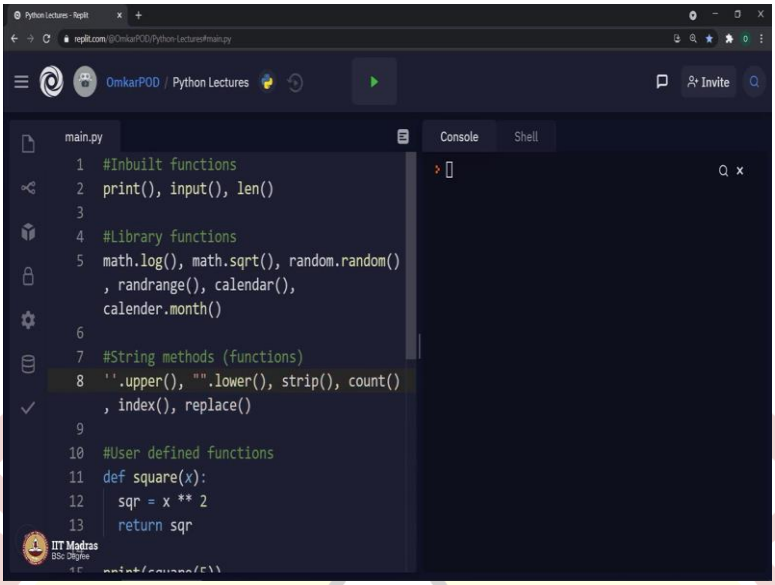


Print, input and len. We all have used these functions many times that is the first category of functions. Before going into depth of this particular category, let me give you few more examples of second category. Log, square root, random, randrange, calendar, month. Let us look at third category, upper, lower, strip, count, index, replace and then the fourth category; a function called square.

Now, as I have explained there are 4 different category and also I have given some examples of each category. Now, can you tell me on what basis these functions are divided into 4 categories? There has to be some similarities between the functions in same category. At the same time there has to be some difference between functions from different category. Can you tell me what that difference is or what that similarity is?

Let us start with the first category. In order to use these functions, print, input, len; simply print in bracket some value will print the particular value. Input will take the input. For example, len with some string will give us the length of these particular string. We do not have to do anything additional to use this particular functions. Therefore, these types of functions are called as inbuilt functions because these functions are part of Python programming language itself.

Whereas, if you look at second category of functions, log or square root functions belong to math library. Random or randrange functions belong to random library and calendar or month functions belong to calendar library. These functions can be used only when you import that specific library and mention that this function belongs to some xyz library. Then only the computer will allow you to use these functions which means, these functions are part of that

specific library, not the Python itself. Therefore, these category of functions are referred as library functions.

Moving to next category, upper, lower, strip, count, index, replace all these functions can be executed only using strings and when that is the case, instead of calling them functions, we call them methods or more specifically string methods. But still, they are nothing but functions.

And then when we reach to our last category of function, for computer this square of 5 has no meaning until we explicitly define the meaning of that particular function. In this case, we explicitly telling the computer that this is what you are supposed to execute when we say square of some number which means, we are defining this function. Hence, this category of the function is referred as user defined functions.

Based on this understanding we can say that all the functions we have used so far fall under these 4 categories; inbuilt functions, library functions, string methods or functions and fourth user defined functions. But if you observe two more similarities with respect to the presentation of these functions irrespective of their categories.

A function is represented in this yellowish colour in replit and it is always followed by these parentheses. This parenthesis is the standard way of representing a function, every function is always followed by a parenthesis. At the same time, you must be wondering why only inbuilt functions and user defined functions are following this particular colour representation over here. Whereas library functions and string methods are not following that particular convention in replit.

This is because in case of library function, log must be written along with math dot log. Now, you can see the colour has been changed. Same math dot square root, random dot random, calendar dot month and so on. So, now you can tell me what we have to do with string methods. As these are string methods, we should start these methods or functions with strings and then you will see it is following the same convention as we mentioned earlier.

One more very important thing we have to remember while using user defined functions. Whenever we use any user defined function, the name of the function has to be in a specific way just like a variable name. Earlier we have seen various rules which we must follow while naming a variable. All those exact rules has to be followed while naming a function as well. Let me summaries what we have seen so far. Let me remove this additional things.

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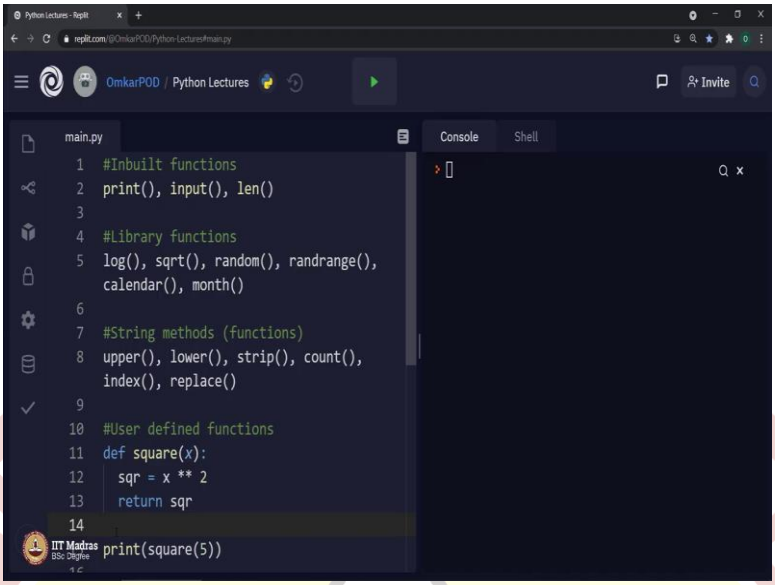


We saw functions first time in the first ever lecture we have seen in this particular course where we used print function, not command or a statement. And these functions fall under the category called inbuilt functions, then this type of function fall under library functions. Then the third category of functions is referred as methods. Now, these methods can be of string type and as we go on we will introduce few more categories of methods.

And the most recently we have introduced the fourth category of functions called as user defined functions. This is the place whereas a programmer, as a user we will decide what will be the functionality or what will be the definition of that particular function. At the same time, we will also define what will be the name of that function and this naming has to be done by following the same rules which we have seen earlier with variables. Thank you for watching this lecture. Happy learning.