1. What is the relationship between def statements and lambda expressions ?

The def keyword is used to define normal functions, while the lambda keyword is used to define anonymous functions. They are, however, limited to a single line of expression. They, like regular functions, can accept several parameters.

1. What is the benefit of lambda?

When compared to a normal Python function written using the def keyword, lambda functions require fewer lines of code. However, this is not quite true because functions defined using def can be defined in a single line. But, def functions are usually defined on more than one line.

They are typically employed when a function is required for a shorter period (temporary), often to be utilized inside another function such as filter, map, or reduce.

You can define a function and call it immediately at the end of the definition using the lambda function. This is not possible with def functions.

1. Compare and contrast map, filter, and reduce.

The map() function iterates through all items in the given iterable and executes the function we passed as an argument on each of them.

Similar to map(), filter() takes a function object and an iterable and creates a new list.

As the name suggests, filter() forms a new list that contains only elements that satisfy a certain condition, i.e. the function we passed returns True.

reduce() works differently than map() and filter(). It does not return a new list based on the function and iterable we've passed. Instead, it returns a single value.

1. What are function annotations, and how are they used?

Function annotations are some random expressions which are written with the functions, and they are evaluated at compile time. They do not exist at run time, and there is no meaning of these expressions to python. They are used and interpreted by a third party or external python libraries.

1. What are recursive functions, and how are they used?

A recursive function is a function in code that refers to itself for execution. Recursive functions can be simple or elaborate. They allow for more efficient code writing, for instance, in the listing or compiling of sets of numbers, strings or other variables through a single reiterated process.

1. What are some general design guidelines for coding functions?

Different modules specified in the design document are coded in the Coding phase according to the module specification. The main goal of the coding phase is to code from the design document prepared after the design phase through a high-level language and then to unit test this code.

Good software development organizations want their programmers to maintain to some well-defined and standard style of coding called coding standards. They usually make their own coding standards and guidelines depending on what suits their organization best and based on the types of software they develop. It is very important for the programmers to maintain the coding standards otherwise the code will be rejected during code review.

1. Name three or more ways that functions can communicate results to a caller.

A Function in Python is a piece of code which runs when it is referenced. It is used to utilize the code in more than one place in a program. It is also called method or procedure. Python provides many inbuilt functions like print(), input(), compile(), exec(), etc. but it also gives freedom to create your own functions.