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

Answers: The only difference is that (a) the body of a lambda can consist of only a single expression, the result of which is returned from the function created and (b) a lambda expression is an expression which evaluates to a function object, while a def statement has no value, and creates a function object and binds it to a name.

2. What is the benefit of lambda?

Answers: The lambda keyword in Python provides a shortcut for declaring small anonymous functions. Lambda functions behave just like regular functions declared with the def keyword. They can be used whenever function objects are required.

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

Answers: Map, Filter, and Reduce are paradigms of functional programming. They allow the programmer to write simpler, shorter code, without necessarily needing to bother about intricacies like loops and branching. 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.

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

Answers: Function annotations are arbitrary python expressions that are associated with various part of functions. These expressions are evaluated at compile time and have no life in python's runtime environment. Python does not attach any meaning to these annotations.

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

Answers: A recursive function is a function that calls itself during its execution. The process may repeat several times, outputting the result and the end of each iteration. The function Count() below uses recursion to count from any number between 1 and 9, to the number 10.

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

Answers:

Safe: It can be used without causing harm.

Secure: It can't be hacked.

Reliable: It functions as it should, every time.

Testable: It can be tested at the code level.

Maintainable: It can be maintained, even as your codebase grows.

Portable: It works the same in every environment.

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

Answers: We can call a function in two different ways, based on how we specify the arguments, and these two ways are: Call by Value. Call by Reference.