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

Both def and lambda are keyword to define a function but lambda is for a quick and simple function while def is used for any type of function. In def we need to give a name of function and use return keyword while we don’t use return keyword in lambda function.

**2. What is the benefit of lambda?**

When we need to use a simple function for a single time then instead of creating it with def we simply create at the time of use and execute. Lambda functions are simple one liner functions without return keyword and not necessarily bind to a name.

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

When we need to apply a function on any iterable item the we use map as it return a map object. e.g., result = list(map(square,nums)) square is a function who returns square of given number and nums is a list contains some numbers then result will be a list of square of numbers in nums.

When we need to filter data from an iterable item base on some conditions then we use filter

e.g., result = list(odd,num) here nums list be filtered by odd() function and there will only odd numbers in result list.

When we need to perform something on all items of iterable and return a single value then we use reduce

e.g., result = reduce(lambda x,y: x\*y),[1,2,3,4,5]) will return multiplication of items in list

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

Python annotations are arbitrary python expressions which are associated with various parts of python programe mentioning important information regarding the code. Python annotations are evaluated at runtime.

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

Recursive functions are the functions which call itself. Mostly we use recursive functions where we need to remember last iteration result on iterative items.

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

Always use docstring mentioning general operation of the function.

Function name should not contain space and should not start with special characters except underscore.

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

Return statement

Print statement

Lambda expression