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

Answer: Def is a statement used to create a function. Lambda is an expression which also produces function.

2. What is the benefit of lambda?

Answer: Lambda can be used to generate functions with less codes, i.e. just like a shortcut to declare functions.

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

Answer: Map, filter and reduce all these expect a function object as the first argument and an iterable and creates a new list. All three are alternate to list comprehension. Reduce works a bit differently and does not return list and rather a single value. Reduce is not a direct function in Python 3+ anymore.

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

Answer: Function annotations are arbitrary python expressions that are associated with various parts of the function. These are evaluated at compile time and not executed in run time. Annotations used in providing type of arguments and return type of the function. String annotations are used for providing messages at compile time regarding various functionalities.

Def funct( a: expression, b: expression =5) -> expression: \*Here expression means type of parameter

Def funct( \*args: expression, \*\*kwargs: expression): -> Here expression means type of parameter

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

Answer: Recursive functions are functions that calls the own function repetitively inside its own function call during execution. These are used to loop through the data to reach a result.

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

Answer: Define the function with a understandable function name and pass arguments as per requirement. Provide a short docstirng and give description. Use \*args or \*\*kwargs for passing numerous parameters. Keep indentation for the statements inside the function body. Always keep an optional return statement as per use.

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

Answer: Use a print statement of end result. Use return statement for result. Store result inside a variable. Use yield statement.