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

>>>The def statements are used with the set of parameters and this is used to define the functions in python they allow us to create the resable pieces of the code.whereas,lamda function is the inline function they are not expected to be reused and the defined by using the using “lambda keyword.

2. What is the benefit of lambda?

>>>They make code more expressive and defining and easy to read .,they help us to define the functions in the compact and in the reliable manner .,also we dont have to make them as a named function and they can be made easily reliable.

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

>>>map:this allows each element to an iterable and return its iterator form.

Filter:filter will The filter function applies a given function to each element of an iterable and returns an iterator with the elements that satisfy a certain condition.

reduce: The reduce function applies a given function to the elements of an iterable in a cumulative way, producing a single result.

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

>>>function annotations are basically hints to the function also they are optional and do not affect the data.and they are given by “:”.

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

>>>the recursive functions are those who call themselves and they have the base case and they will be performing until the base case and then they will just get terminated.

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

>>>Functions should have a clear purpose and perform a single task or operation.

* Use descriptive and meaningful names for functions and parameters.
* Keep functions short and focused, following the principle of "one function, one job."
* Avoid code repetition by creating reusable functions.
* Use comments and docstrings to provide documentation for the function's behavior and usage.
* Write functions that are testable and independent of external dependencies.
* Adhere to the PEP 8 style guide for consistent and readable code.

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

>>>Return statement: Functions can use the return statement to send a value back to the caller.

* Side effects: Functions can modify variables or objects outside their scope, allowing the caller to access the updated results.
* Exceptions: Functions can raise exceptions to indicate errors or exceptional conditions to the caller.