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

***As an expression, lambda returns a value that can optionally be assigned a name. The def statement always assigns the new function to the name in the header, instead of returning it as a result***

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

***The lambda keyword in Python provides a shortcut for declaring small anonymous functions.***

***It can be used to create more efficient syntax. The main function doesn't need to be called every time. After a variable is assigned an instance of the containing function, specifying the lambda inputs in parentheses next to the variable name will execute the function with lambda expression.***

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

***map:***

***The map() function iterates through all items in the given iterable and eWe can pass as many iterable objects as we want after passing the function we want to use and executes the function we passed as an argument on each of them.***

***syntax:***

***map(function, iterable(s))***

***filter:***

***Similar to map(), filter() takes a function object and an iterable and creates a new list.filter() forms a new list that contains only elements that satisfy a certain condition, i.e. the function we passed returns True.***

***syntax:***

***filter(function, iterable(s))***

***reduce:***

***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.***

***syntax:***

***reduce(function, sequence[, initial])***

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

***Optional metadata about the types used by user defined functions.***

***Evaluated at compile time and have no life in python’s runtime environment. Python does not attach any meaning to these annotations. They take life when interpreted by third party libraries.***

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

***A recursive function is a*** [***function***](https://techterms.com/definition/function) ***that calls itself during its execution.***

***recursion is meant to break down a large task into smaller tasks.instead of using loop.***

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

***Any args or input parameters should be placed within parentheses***

***The function first statement can be an optional statement- docstring or the documentation string of the function***

***The code within every function starts with a colon (:) and should be indented (space)***

***The statement return (expression) exits a function, optionally passing back a value to the caller. A return statement with no args is the same as return None.***

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