1) . What is the difference between enclosing a list comprehension in square brackets and parentheses?

2) What is the relationship between generators and iterators?

3) What are the signs that a function is a generator function?

4) What is the purpose of a yield statement?

5) What is the relationship between map calls and list comprehensions? Make a comparison and contrast between the two.

Answer:

1. The difference between enclosing a list comprehension in square brackets and parentheses is that square brackets create a list, whereas parentheses create a generator object. A list comprehension creates an entire list in memory, while a generator expression generates each value on-the-fly as needed, making it more memory-efficient for large data sets.
2. Generators are a type of iterator. They are functions that use the yield keyword to return an iterable sequence of values one at a time, instead of returning a single result like a regular function. They can be used to generate an arbitrary number of values without having to store them all in memory at once.
3. The signs that a function is a generator function are that it contains a yield statement, and when called, it returns a generator object instead of an immediate result.
4. The purpose of a yield statement in a generator function is to suspend the function's execution and return a value to the caller. When the function is called again, it picks up where it left off and continues until the next yield statement is encountered, where it will suspend execution again and return another value.
5. Map calls and list comprehensions are both ways to apply a function to every element of a sequence, but they have some differences. A map call returns a map object, which is an iterator that applies the function to each element on-the-fly. A list comprehension returns a new list, created by applying the function to each element of the sequence. List comprehensions can also include conditionals, making them more flexible in some cases. Map calls can be more memory-efficient for large data sets, but list comprehensions are often more readable and easier to understand.