**Assignment - 25**

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

Ans: Enclosing a list comprehension in square brackets ([]) creates a list, while enclosing it in parentheses (()) creates a generator expression. The main difference is that a list comprehension produces the entire list in memory at once, while a generator expression produces values lazily, on-demand, thus saving memory.

1. What is the relationship between generators and iterators?

Ans: Generators are a special type of iterator. While iterators are objects that implement the \_\_iter\_\_() and \_\_next\_\_() methods, generators are a convenient way to create iterators using a function with a yield statement. Every generator is an iterator, but not every iterator is a generator.

1. What are the signs that a function is a generator function?

Ans: The presence of a yield statement within a function indicates that it is a generator function. When a function contains yield, it becomes a generator, allowing it to yield multiple values over time instead of returning a single value.

1. What is the purpose of a yield statement?

Ans: The yield statement is used in generator functions to yield a value to the caller while preserving the function's state. When yield is encountered, the function's execution is paused, and the value is returned to the caller. The function can later be resumed from the same state, continuing execution after the yield statement.

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

Ans: Both map calls and list comprehensions are used to transform elements in a sequence, but they have differences. map applies a function to each item in an iterable and returns an iterator that yields the results one by one. List comprehensions, on the other hand, construct a new list by evaluating an expression for each item in the iterable. List comprehensions are often more concise and readable, while map is useful when applying a function to multiple iterables simultaneously. Additionally, list comprehensions can filter elements using conditions, which is not directly possible with map. However, in terms of performance, map may be more memory-efficient when dealing with large datasets due to lazy evaluation.