Explain the concept of recursion and how it can simplify certain problems.

Recursion is a technique where a function calls itself to solve smaller parts of a problem. It simplifies complex problems by breaking them into simpler, repeatable steps.

Discuss the time complexity of your recursive algorithm.

The time complexity of the recursive calculateFutureValue algorithm is O(n), where n is the number of years. This is because the function makes one recursive call per year, resulting in n total recursive calls.

Explain how to optimize the recursive solution to avoid excessive computation.

To optimize the recursive solution and avoid excessive computation, you can use iteration instead of recursion, which reduces the overhead of recursive calls. Alternatively, for problems with overlapping subproblems, you can apply memoization to store and reuse results of previous calls. This prevents repeated calculations and improves performance.

Exercise 7: Financial Forecasting

