Learning part

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

Ans: Recursion is a programming technique in which a function calls itself to resolve subproblems.

By dividing them into smaller, repetitive subtasks, it makes tasks like calculating growth over time, factorials, and tree traversing easier. Recursion makes it simple to model compound growth over a variety of time periods in forecasting.

FORMULAE Used here :  
 The formula is Future Value = Base Value × (1 + Growth Rate) 𝑛 Future Value = Base Value × (1 + Growth Rate) n

Where:

Base Value = starting sum (current revenue, for example)

Growth Rate (as a decimal) = annual increase percentage

n is the number of time periods (years).  
  
  
  
 ANALYSIS PART  
  
***Time Complexity:***

Since the recursive function calls once a year until it hits zero, the time complexity is:

O(n), in which n is the number of years.

***Optimization:***To prevent needless recursive calls for large n:

Utilize memoization to save previously determined values.

Or, to conserve stack space, use an iterative strategy, such as a for loop.