Intermediate Data Structures & Algorithms – CS 141 (Discussion)

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Question 1

What is the time Complexity of following function?

def func(n):
    if n==1:
        do_something()
    elif n==2:
        do_something_else()
    else:
        for i in range(n):
            func(n-1)
            do_something_different()
Question 2

Solve the following recurrence relation:

\[
T(n) = \begin{cases} 
4 & \text{if } n = 1 \\
4T(n - 1) + 3 & \text{if } n > 1 
\end{cases}
\]
Question 3

Upper bound for the following recurrence relation?

\[ T(n) = \begin{cases} 
    o(1) & \text{if } n = 1 \\
    3T\left(\frac{n}{2}\right) + o(n) & n > 1 
\end{cases} \]
Use master theorem:

$$T(n) = 7T\left(\frac{n}{7}\right) + n$$
Question 5

Upper bound for following recurrence relation?

\[ T(n) = T(n - 1) + n^c, T(1) = 1 \]