Selected Problem in CLRS

Section 4

Notifications

Problem Difficulty (count with star)

1. you can solve w/o the brain
2. you can solve if you think a bit
3. you can solve if you think carefully
4. you might solve if you push yourself
5. you can solve if you use other's brain

YOU NEED TO SOLVE FORMALLY especially in this chapter

Exercise

3.1-1 $\star\star$

Using the basic definition of Θ-notation, prove that

$$\max(f(n), g(n)) = \Theta(f(n) + g(n))$$

3.1-2 $\star\star$

Show that for any real constants a and b, where $b > 0$,

$$(n + a)^b = \theta(n^b)$$

3.1-4 $\star\star$

Is $2^{n+1} = O(2^n)$? Is $2^{2n} = O(2^n)$

3.1-5 $\star\star\star$

Prove that(***Theorem 3.1***), For any two functions $f(n)$ and $g(n)$, we have $f(n) = \Theta(g(n))$ if and only if $f(n) = O(g(n))$ and $f(n) = \Omega(g(n))$