A SIMPLE INDUCTION PROOF

Hi all,
Here is another practice exercise!

Find a simple Big-O upper bound in terms of a simple function of n (and *prove* why it is an upper bound) for

$$1 + 2 + 3 + \ldots + n \tag{1}$$

or more precisely

$$\sum_{i=1}^{n} i$$

While you can easily find such a bound if you *know* the closed form formula for (1), this is a bad way of going about it (do only if you are desperate :)

The thing is, we do not always *know* a closed form for a sum like

$$\sum_{i=1}^{n} f(i)$$

where f is some function. E.g., do you know a closed form for $\sum_{i=1}^{n} i^5$? I don't either, but I can sure give you a "tight"[2] big-oh bound!

So, read the 6.1 in the last chapter that I uploaded today (March 22, 2020; Notes #11), and send me your solutions *tomorrow* between 2:00pm – 3:00pm via Moodle upload (Moodle area "practice #3").

[2]Almost any sum you throw at me is $O(2^{2^{2^{2^{2^{2^n}}}}})$, but this is TOO pessimistic. A tight bound is as close as it gets to what you are bounding!