

utfcode

utf8.sty 3.10 UTF-8 input encoding 13.06.2000

scanner for code UTF-8 installed.

Homework 2: How to Count
CS 1234: Repeatedly Greeting the Universe
Jane Doe — id123
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1. (a)
 - I can count!
 - Of course I can count.
 - Counting is cool.

(b) **[TODO — fix]**

2. *Proof.* Let $P(n)$ be the statement that $\sum_{i=1}^n i = \frac{n(n+1)}{2}$.

BASIS: $P(1)$ is true, since $\frac{1 \cdot (1+1)}{2} = 1$.

INDUCTIVE STEP: Assume that $P(k)$ is true where k is an arbitrary fixed integer greater than

1. We will prove that $P(k)$ is true; in other words, that $\sum_{i=1}^{n+1} i = \frac{(n+1)(n+2)}{2}$

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

$$= \frac{n(n+1)}{2} + (n+1) \tag{IND. HYPOTHESIS}$$

$$= \frac{n(n+1) + 2(n+1)}{2} \tag{2}$$

$$= \frac{(n+1)(n+2)}{2}$$

This completes the inductive steps. Thus, by mathematical induction, $P(n)$ is true for all integers n with $n \geq 1$. □

3. Wow, (1) is a cool equation.