4.2 and 4.3 Proof by Mathematical Induction

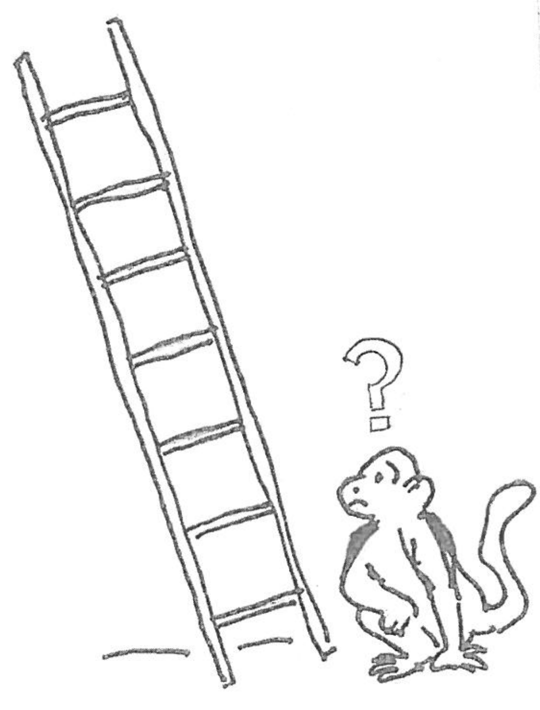
To prove that a certain statement is true for all values of n, $n \geq 1$:

Step 1 (the basis step)
Show that your statement is true for $n = 1$.

Step 2 (the inductive step)
Show that if your statement is true for n, then it must be true for $n+1$.

OR: To teach your monkey to climb a ladder, you need to teach him two tricks:

1. how to get onto the first rung of the ladder.
2. how to climb from each rung to the next.



Proof by Mathematical Induction

vs. Proof by STRONG Mathematical Induction 4.4

Plain old Math induction

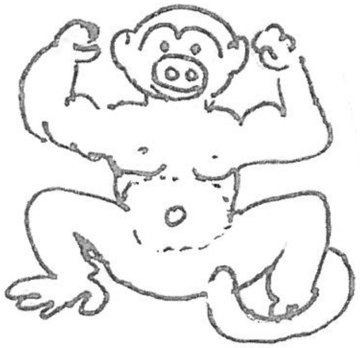
Idea: The proof of the inductive step only requires that you look back one step.

Proof Structure:

1. Show true for first step.
2. Show if true for a particular step, it's true for the next step.

STRONG Math Induction

Idea: The proof of the inductive step requires that you look back more than one step.



Proof Structure: (general)

1. Show true for all n less than or equal to b.
2. Assume true for all values less than or equal to k, show true for k+1. ($k>b$)

Proof Structure (typical):

1. Show true for first two steps.
2. Assume true for k and k+1, show true for k+2.