# Summarizing what we did

Recall that we had a recursively defined function $f : \mathbb{Z}^+ \times \mathbb{Z}^+ \to \mathbb{Z}^+$, defined by

- $f(n, m) = n + m$ if $n = 1$ or $m = 1$,
- $f(n, m) = f(n-1, m) + f(n, m-1)$, otherwise

We wanted to prove that $f(m, n) \geq m + n$ for all positive integers $m, n$.

It is easy to verify this inequality for the case where $m = 1$ or $n = 1$. To prove it true for all $m, n$, we used induction.

But induction must be done for some single parameter.

We used $K = m + n$ as our single parameter.

Our inductive hyopthesis was

> $P(K) : f(n, m) \geq n + m$ for all positive integers $n, m$ with $n + m \leq K$