Inference at $*$ 1 2 1
of proof for Lemma fast-fib:

1. $n : \mathbb{Z}$
2. $0 < n$
3. $\forall a, b{:}\mathbb{N}.$
   $\{m{:}\mathbb{N} \mid$
   $\forall k{:}\mathbb{N}.$
   $(a = \text{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (b = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (b = \text{fib}(k \text{ - } 1)))$
   $\Rightarrow (m = \text{fib}((n \text{ - } 1)+k))\}$
4. $a : \mathbb{N}$
5. $b : \mathbb{N}$
6. $\forall b_1{:}\mathbb{N}.$
   $\{m{:}\mathbb{N} \mid$
   $\forall k{:}\mathbb{N}.$
   $(a+b = \text{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (b_1 = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (b_1 = \text{fib}(k \text{ - } 1)))$
   $\Rightarrow (m = \text{fib}((n \text{ - } 1)+k))\}$

$\vdash \{m{:}\mathbb{N} \mid$
$\forall k{:}\mathbb{N}.$
$(a = \text{fib}(k))$
$\Rightarrow ((k \leq 0) \Rightarrow (b = 0))$
$\Rightarrow ((0 < k) \Rightarrow (b = \text{fib}(k \text{ - } 1)))$
$\Rightarrow (m = \text{fib}(n+k))\}$
by InstHyp $[a]$ (-1)

1: . . . . .wf. . . . . NILNIL

$\vdash a \in \mathbb{N}$

2:

7. $\{m{:}\mathbb{N} \mid$
   $\forall k{:}\mathbb{N}.$
   $(a+b = \text{fib}(k))$
   $\Rightarrow ((k \leq 0) \Rightarrow (a = 0))$
   $\Rightarrow ((0 < k) \Rightarrow (a = \text{fib}(k \text{ - } 1)))$
   $\Rightarrow (m = \text{fib}((n \text{ - } 1)+k))\}$

$\vdash \{m{:}\mathbb{N} \mid$
$\forall k{:}\mathbb{N}.$
$(a = \text{fib}(k))$
$\Rightarrow ((k \leq 0) \Rightarrow (b = 0))$

$\Rightarrow ((0 < k) \Rightarrow (b = \text{fib}(k - 1)))$
$\Rightarrow (m = \text{fib}(n+k))\}$

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http://www.nuprl.org/FDLcontent/p0_963683_/p25_480536_{fast-fib}1_2_1.html