```
length_firstn  THM

⊢  ∀as:A List, n:{0...||as||}. ||firstn(n;as)|| = n
| by (CDToVarThen ‘as’ ListInd) THEN (Analyze 0)
|
|\
| 1. A : Type
| 2. A List
| 3. n : {0...||nil||}
| ⊢  ||firstn(n;nil)|| = n  by Reduce 3 THEN RecCaseSplit ‘firstn‘
| |
| |\
| | 3. n : {0...0}
| | 4. 0<n
| | ⊢  0 = n  by Auto
| |
| .\
| . 3. n : {0...0}
| . 4. n≤0
| . ⊢  0 = n  by Auto
|
.\
. 1. A : Type
. 2. A List
. 3. u : A
. 4. v : A List
. 5. ∀n:{0...||v||}. ||firstn(n;v)|| = n
. 6. n : {0...||u.v||}
. ⊢  ||firstn(n;u.v)|| = n  by RecCaseSplit ‘firstn‘
. |
. |\
. | 7. 0<n
. | ⊢  ||firstn(n-1;v)||+1 = n  by RWW "5" 0
. |
. .\
. . 7. n≤0
. . ⊢  0 = n  by Auto
END
```