

Proof of linear search algorithm, you can find the implementation [here](#).
Pseudocode-Search.

1. **for** $i = 0$ **to** $n-1$
2. **if** $v == A[i]$
3. **return** i
4. **return** 'N'

Loop invariant:

At the start of each iteration of the **for** loop of lines 1-3, **if** $v == A[i]$ i is returned. Otherwise at the end of the loop 'N' is returned.

Initialization:

When $i = 0$, **if** $A[0] = v$; then i is return and the **for** loop breaks.

Maintenance:

If there's another iteration, that means that for the previous value of i : $A[i] \neq v$. If for the current value of i happens that $A[i] = v$ then i is returned and the **for** loop breaks.

Termination:

When the loop finishes i had browsed all the posible positions of the array and v was not found then 'N' is returned.