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ICS 311
Homework 1
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Question for lecture 2

I'm not very clear about the concept of loop invariants in p. 17. Do all the loop operations have this feature? I wrote down what I think is the loop invariant is for the problem 2.1-3 as below. Is it correct?

```
LINEAR-SEARCH( $A, v$ )  
1  for  $i \leftarrow 1$  to  $length[A]$   
2      do if  $A[i] = v$   
3          then return  $i$   
4  return NIL
```

Loop Invariant—At the start of each iteration of the **for** loop of lines 1-3, the subarray $A[1 \dots i - 1]$ does not consist of the element v .

It looks pretty obvious to initialize, maintain, and terminate...

Initialization: When the program starts, the subarray doesn't have any element, so it holds the invariant.

Maintenance: It keeps looking if it's not found and the subarray $A[1 \dots i - 1]$ doesn't have what I'm looking for.

Termination: It terminates when the item is found.