Linked Structures

(A O(n) algorithm with a large constant factor!)

You'll need access to a laptop.

Appending

Snarf Sep24InClass

Read ExpandingArray, and then:

http://goo.gl/GzP8g

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Read it, and then:

http://goo.gl/GzP8g

and then:

http://goo.gl/S7UaJ

We have a problem...

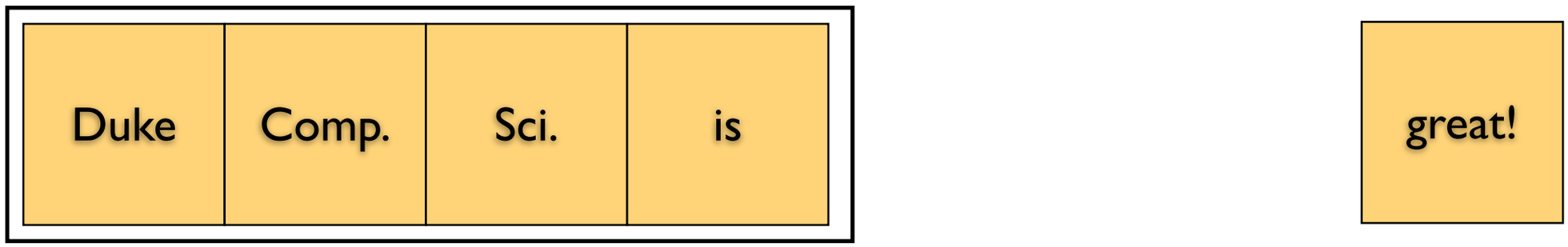
`ExpandingArray`

.get(): *O(1)* *You couldn't hope for better!*

.add(): *O(n)* *Which means* $O(n^2)$ *for* n *operations...*

Vitally important: ArrayLists have better Big-O performance than this!

Block Structures



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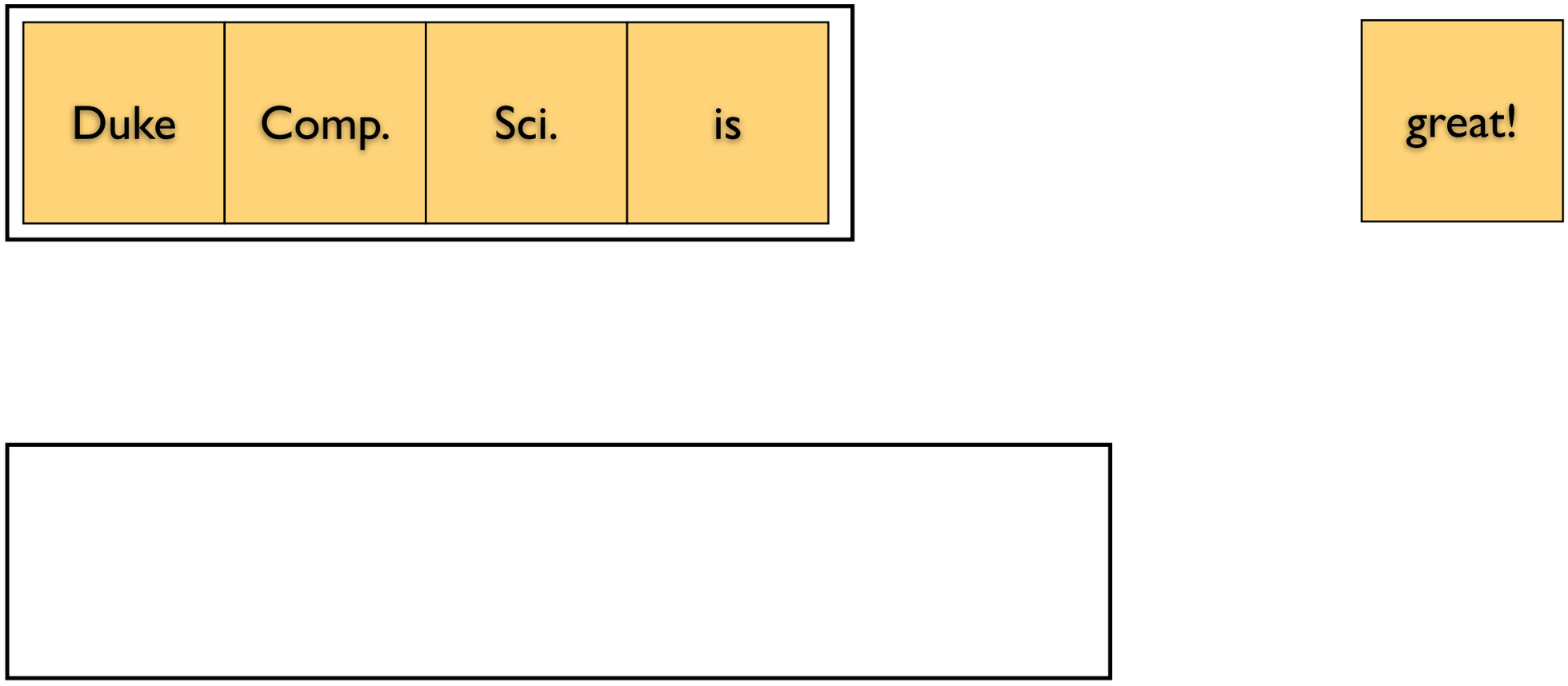

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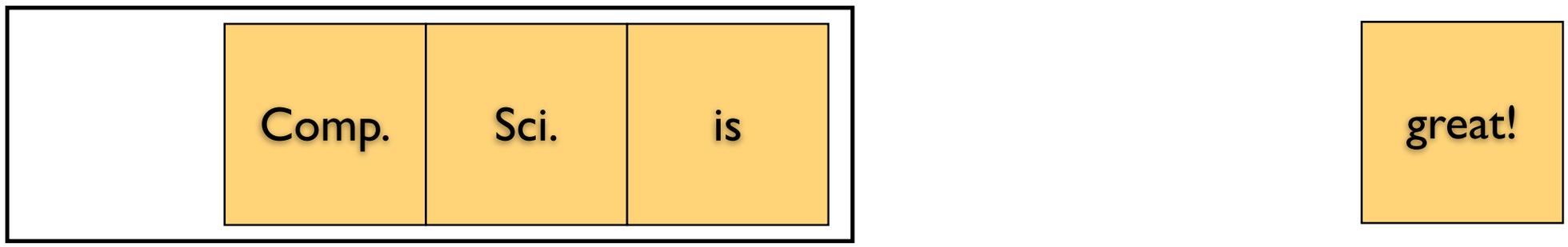

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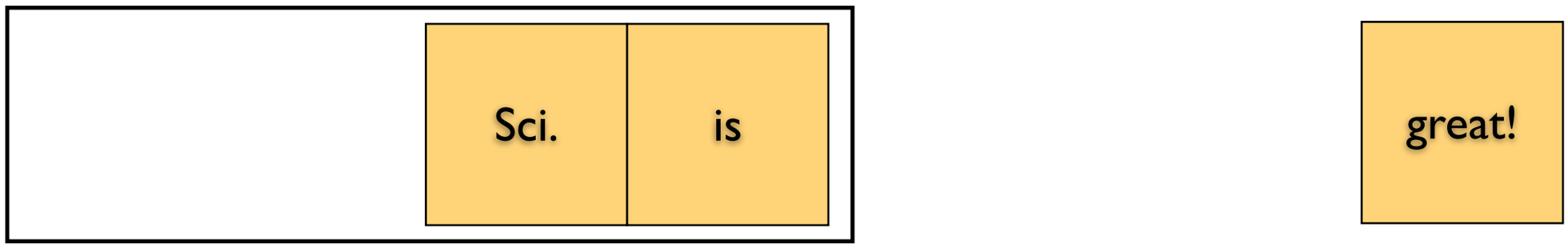

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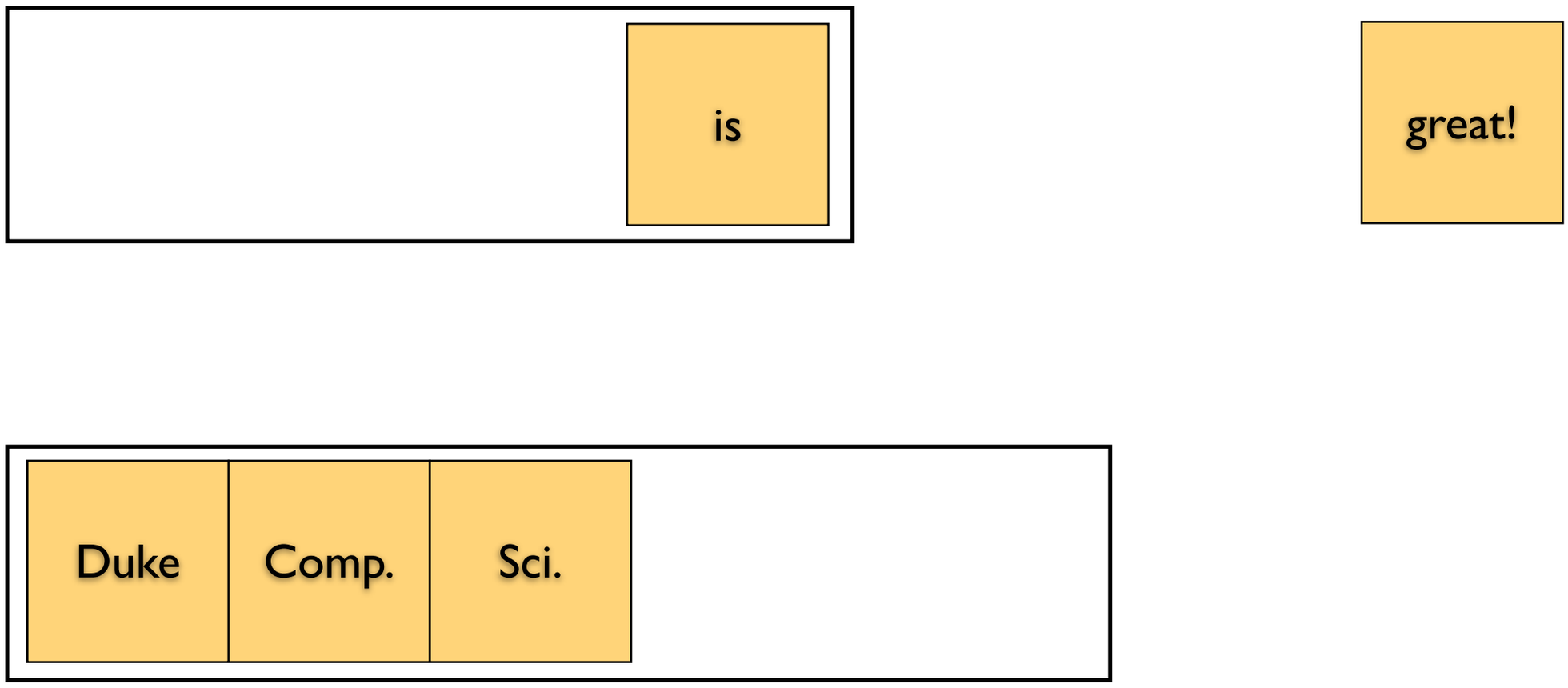

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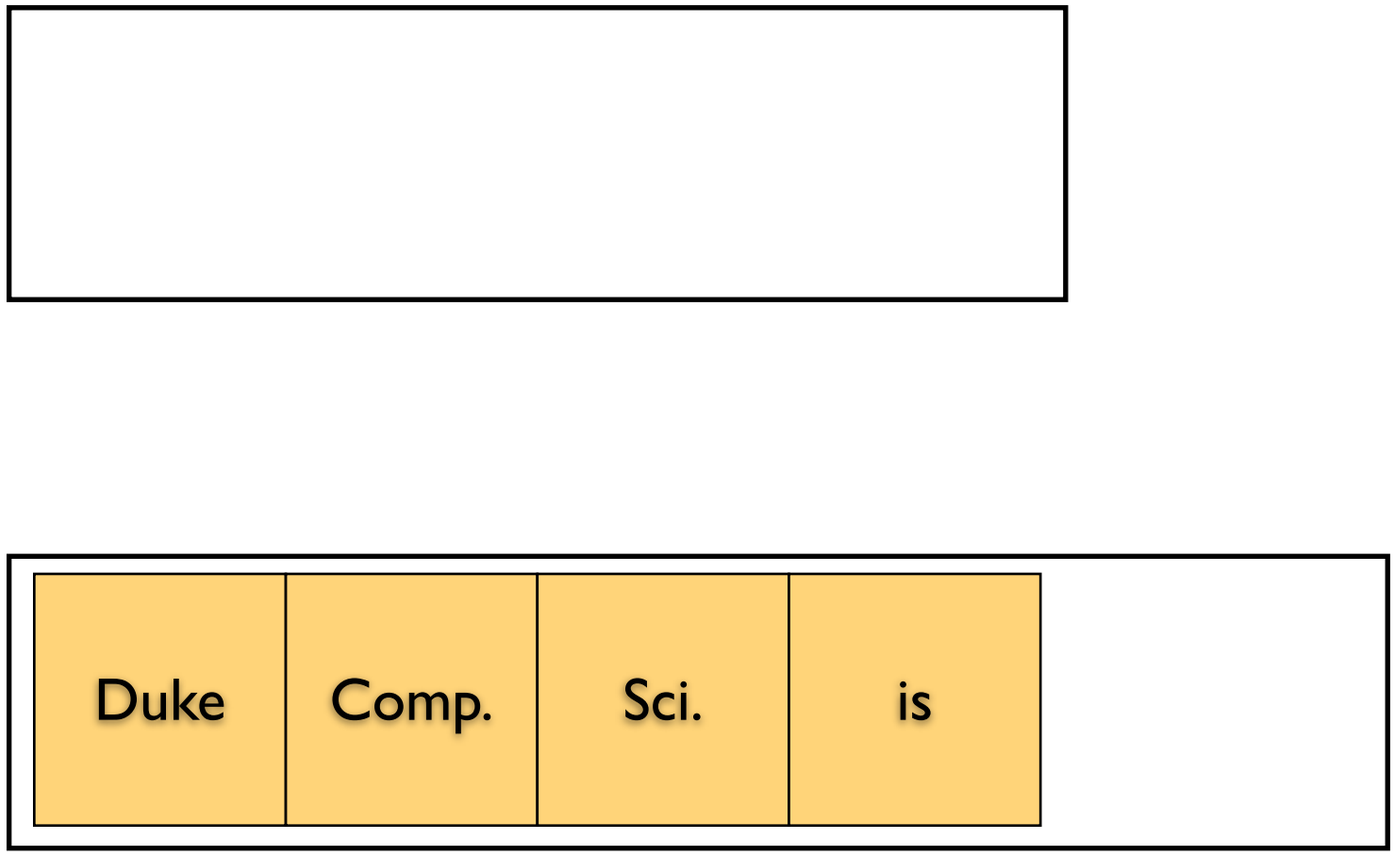

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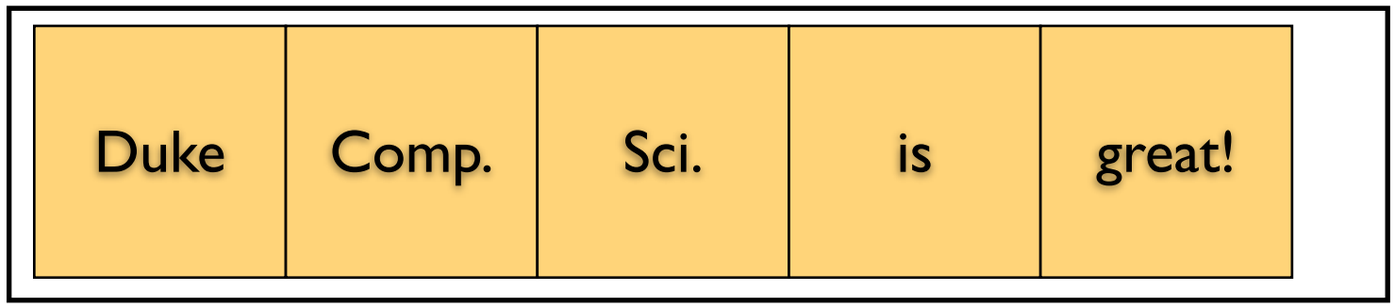

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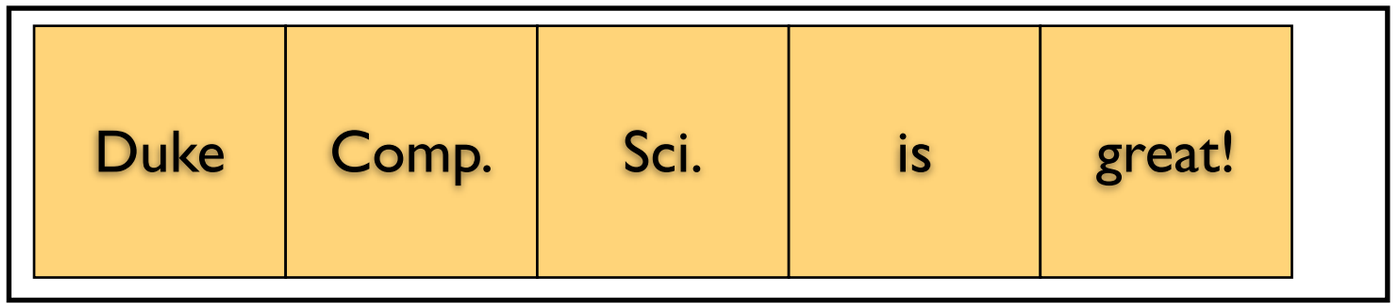

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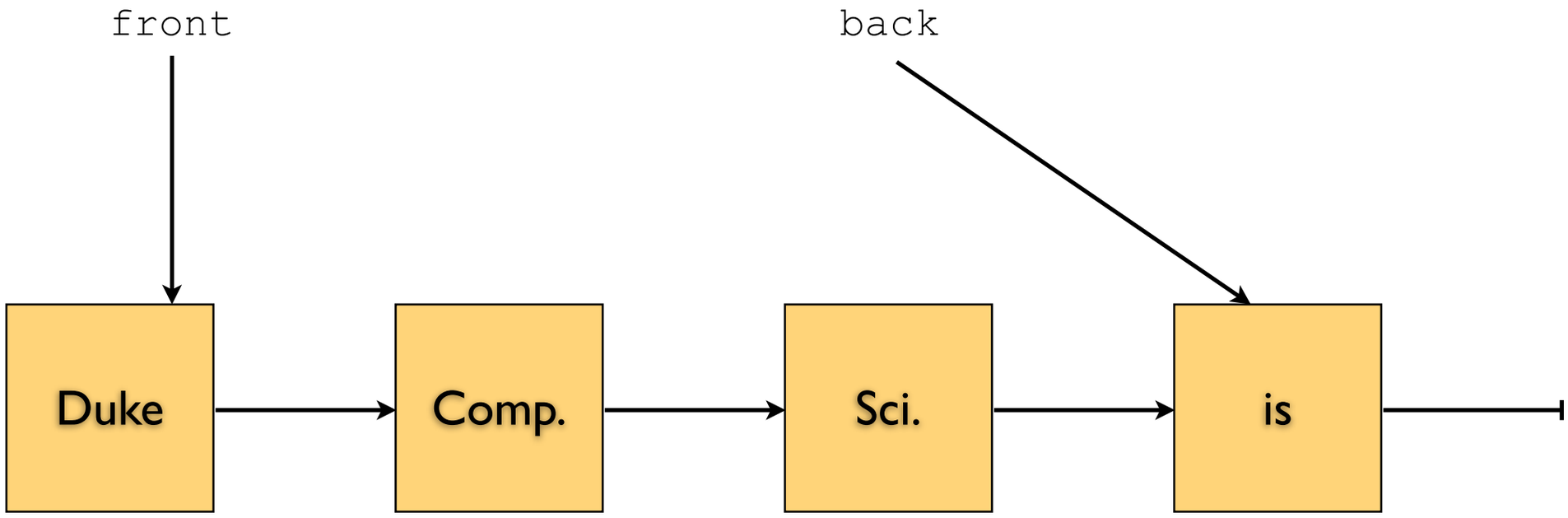
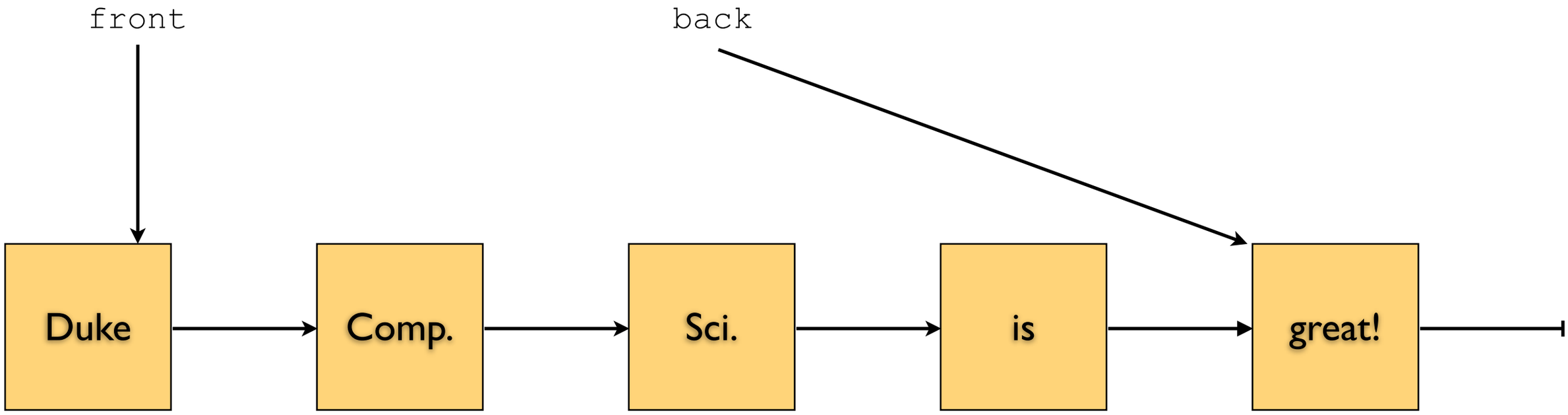


Each element has a
pointer to the next one!

great!

Linked Structures



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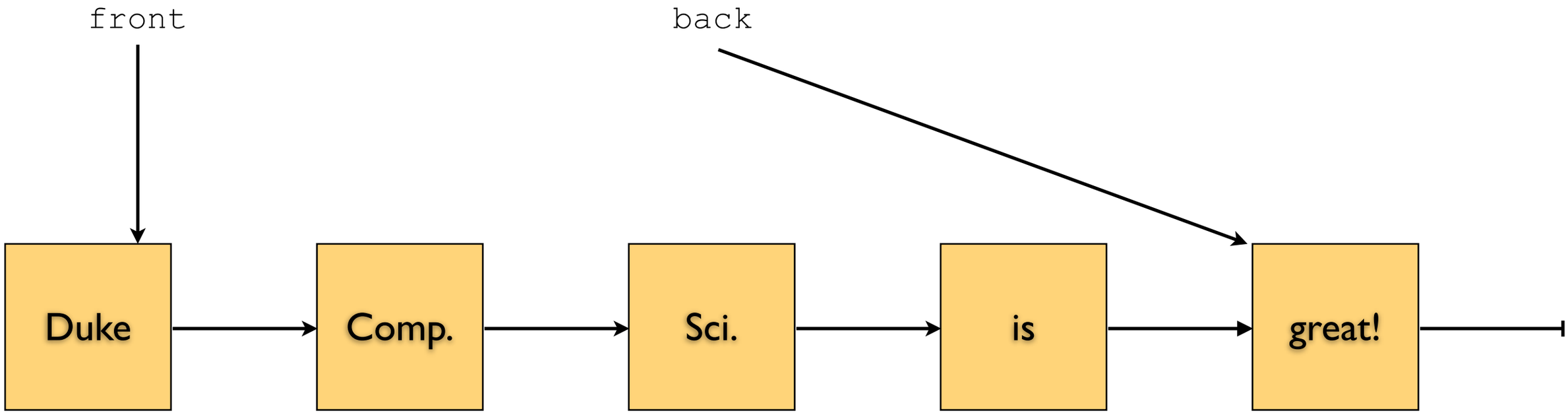

http://goo.gl/mDiBQ

...do we have a solution?

`ExpandingArray`

.get(): *O(1)* *You couldn't hope for better!*

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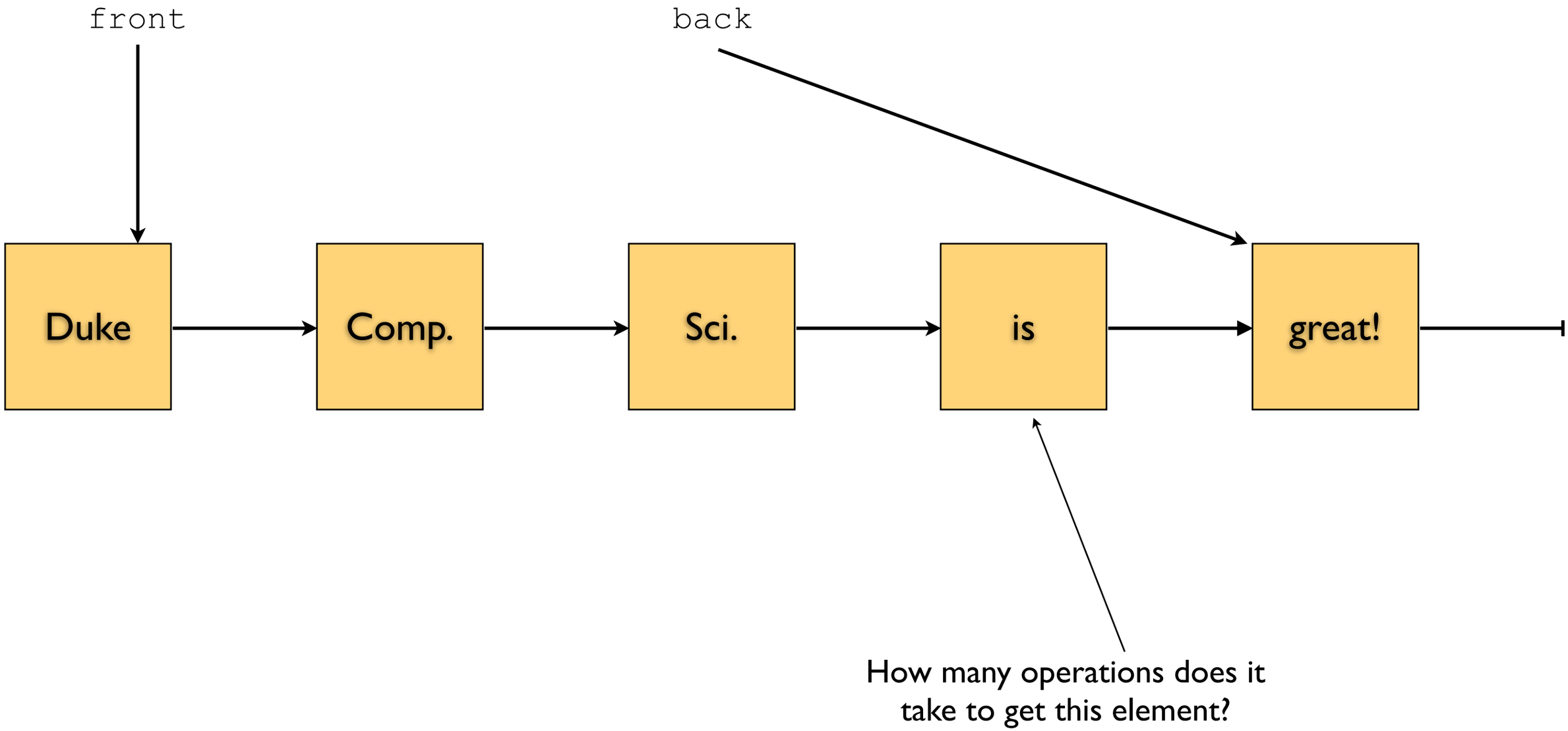
Linked List

.get():

.add(): *O(1)* *Best it can be!*

Super important: Java has a LinkedList class. It's doing something slightly different than this one, but the Big-O is the same.

Linked Structures



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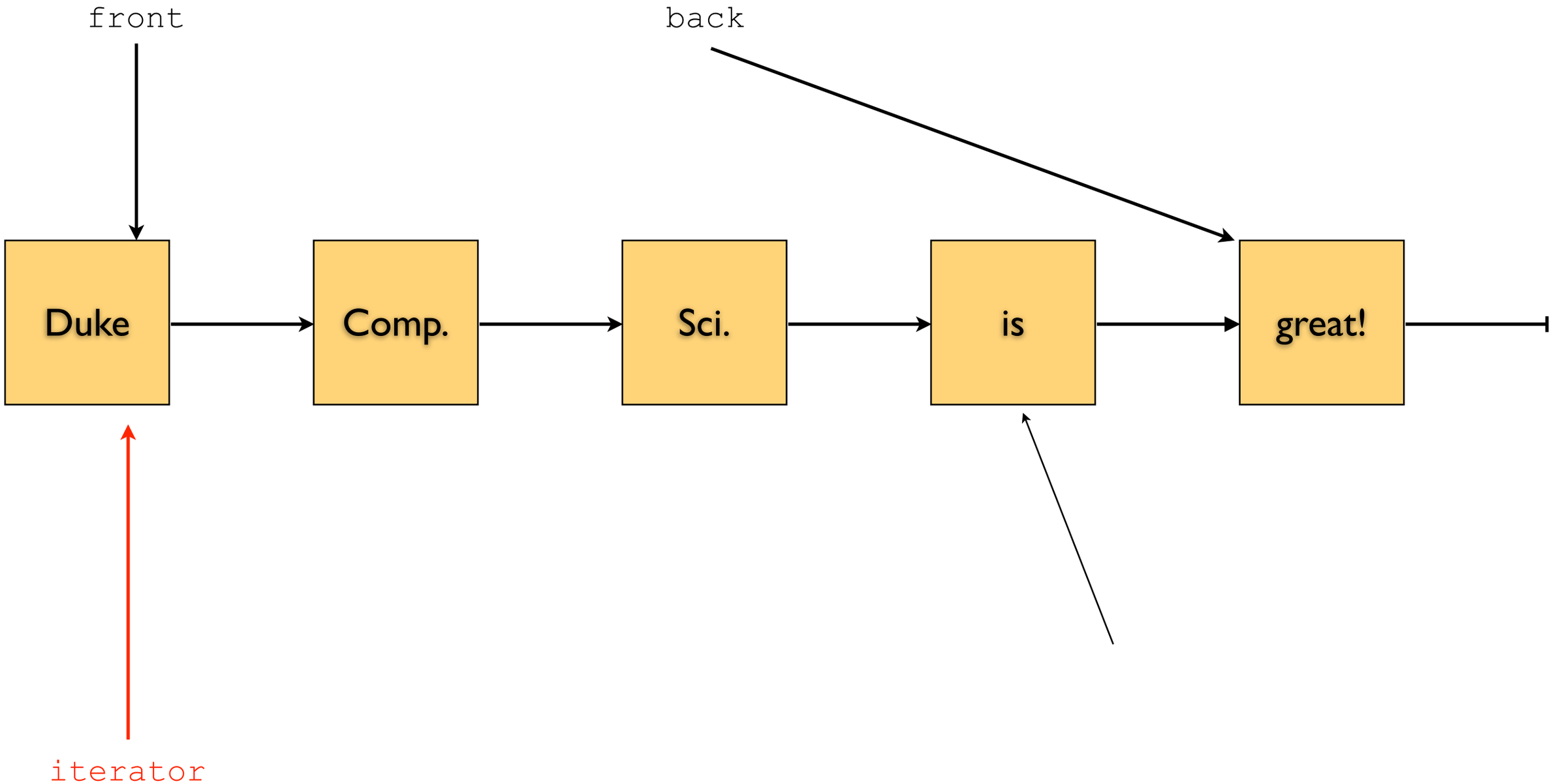

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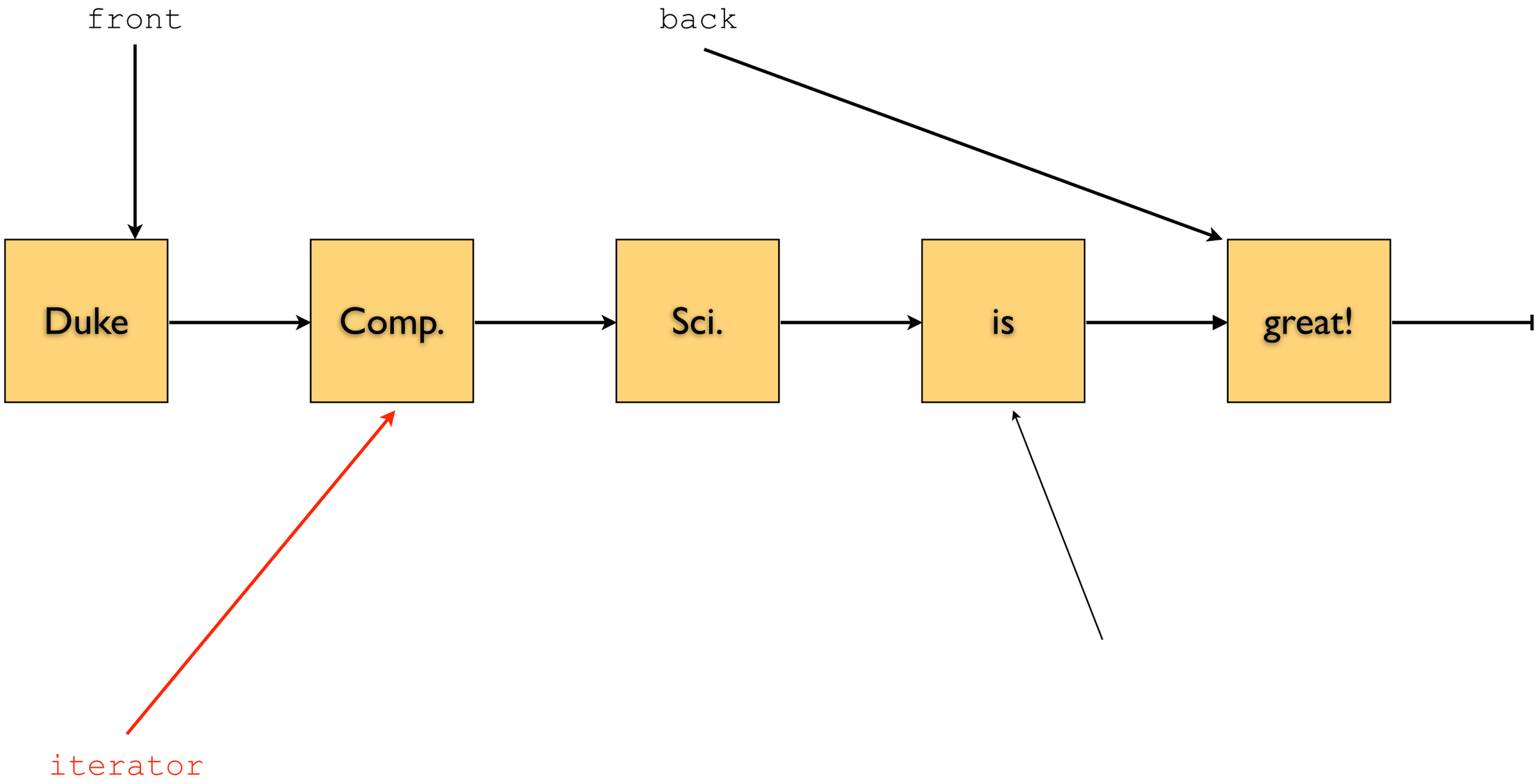

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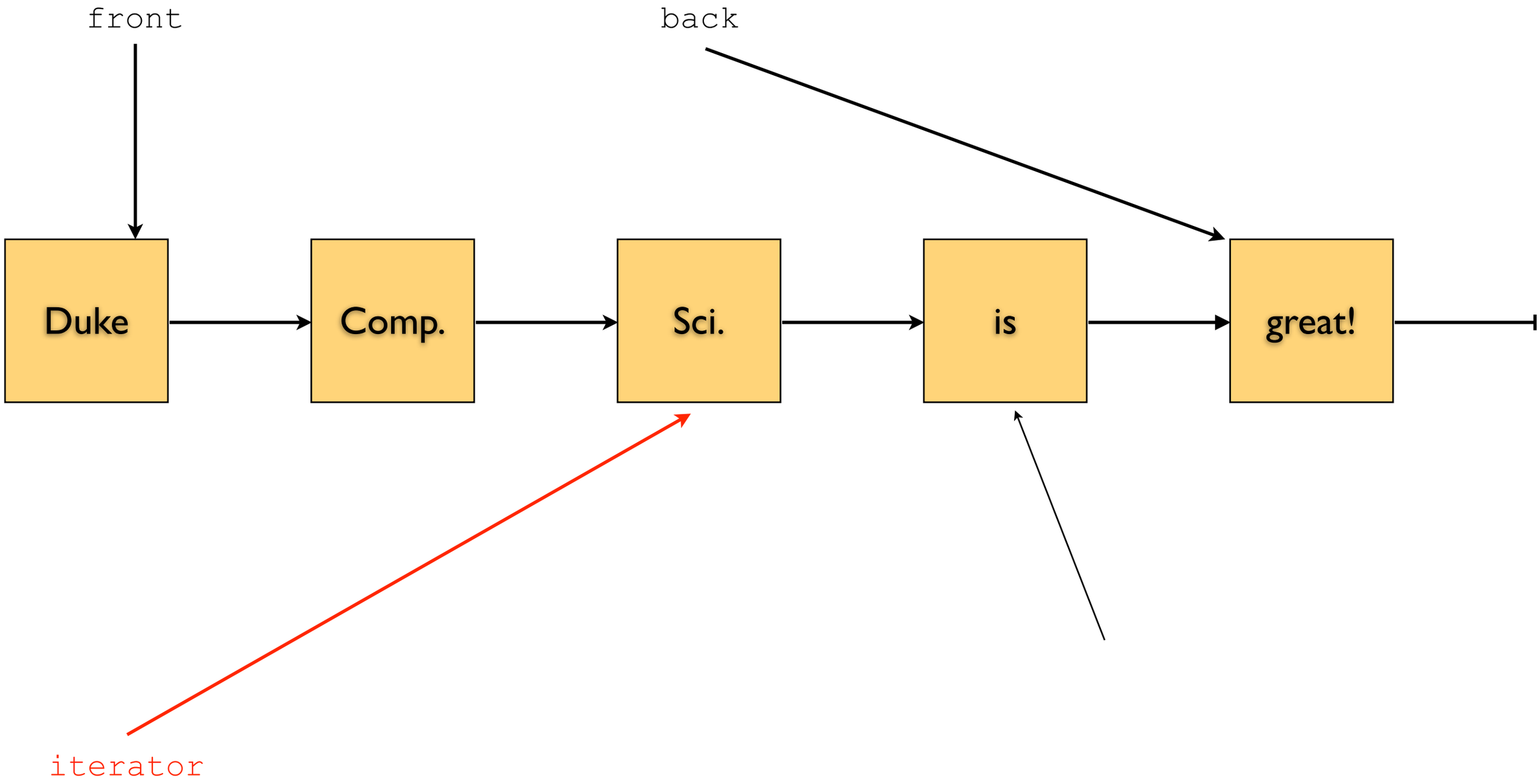

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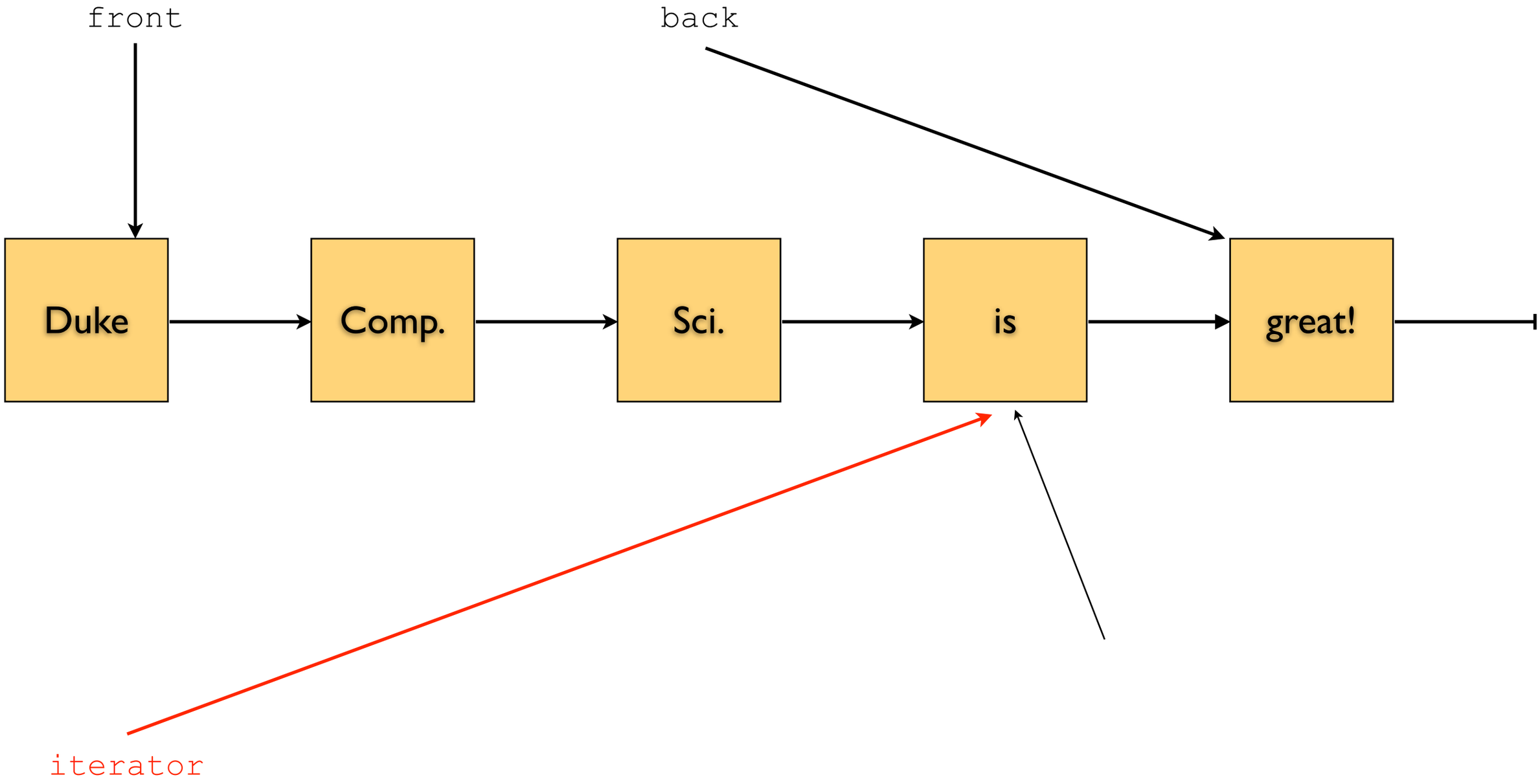

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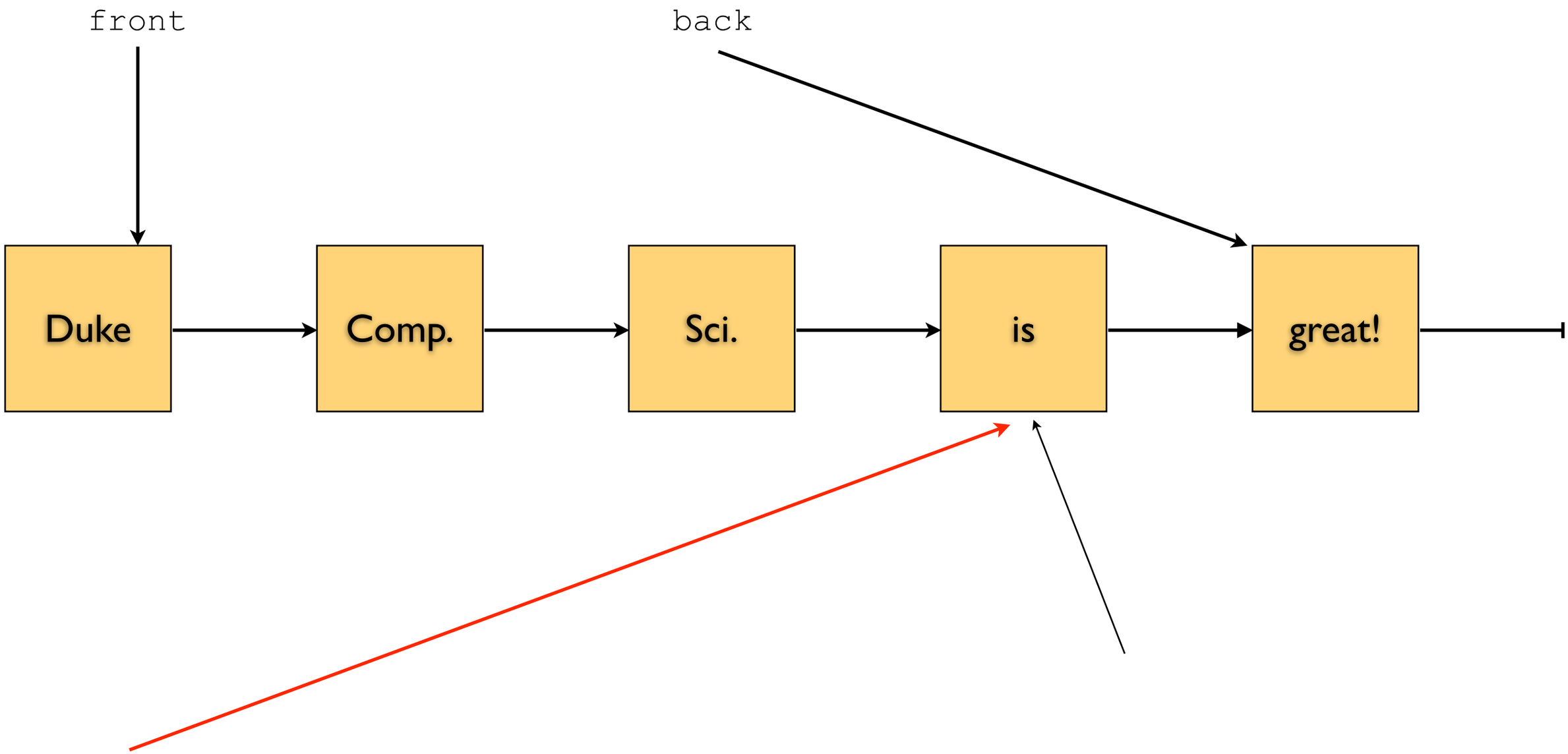

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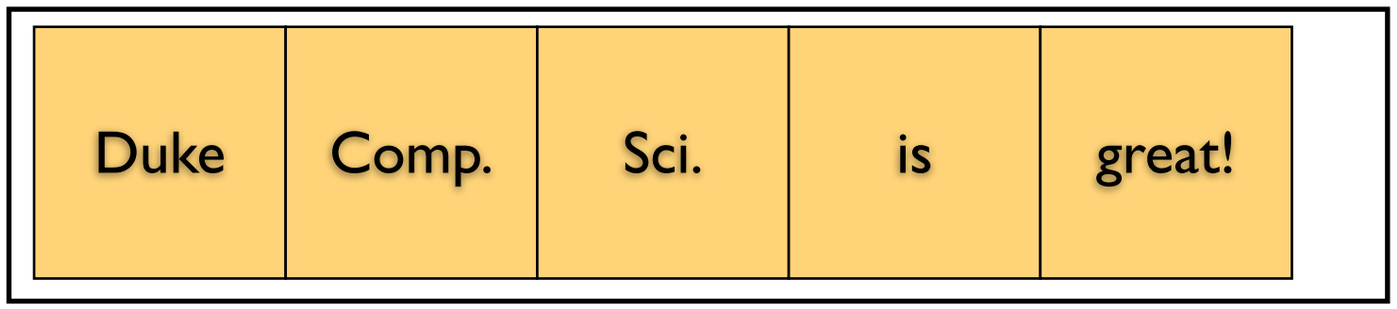
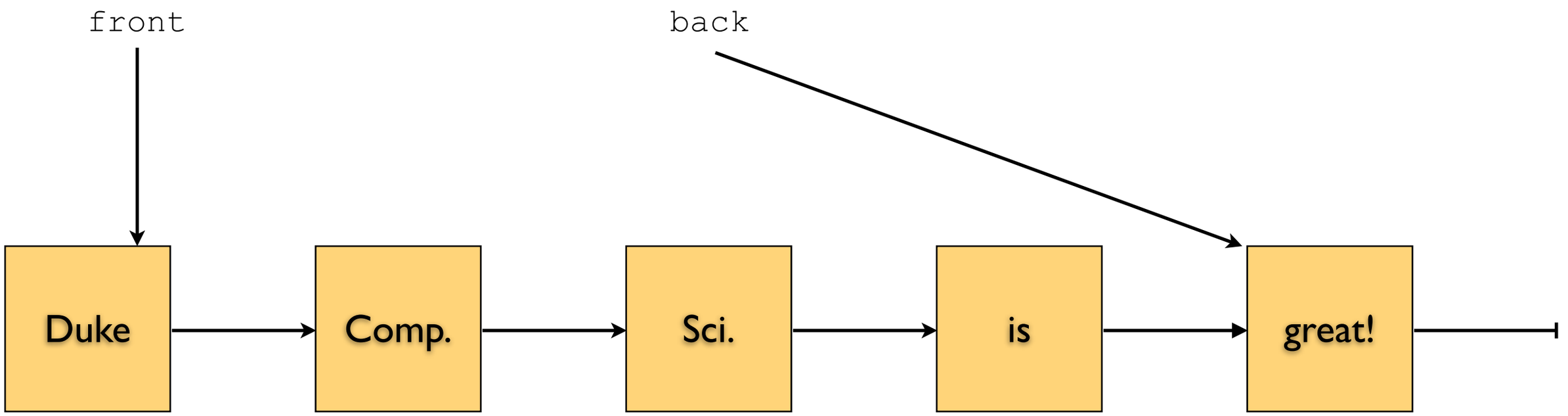
What about...





...adding at the front?

Or in the middle?

Science!

http://goo.gl/nbF0j

(and the usual survey)

http://goo.gl/Z09dK