Computational Thinking and Algorithms

159.172

More on Linked Lists

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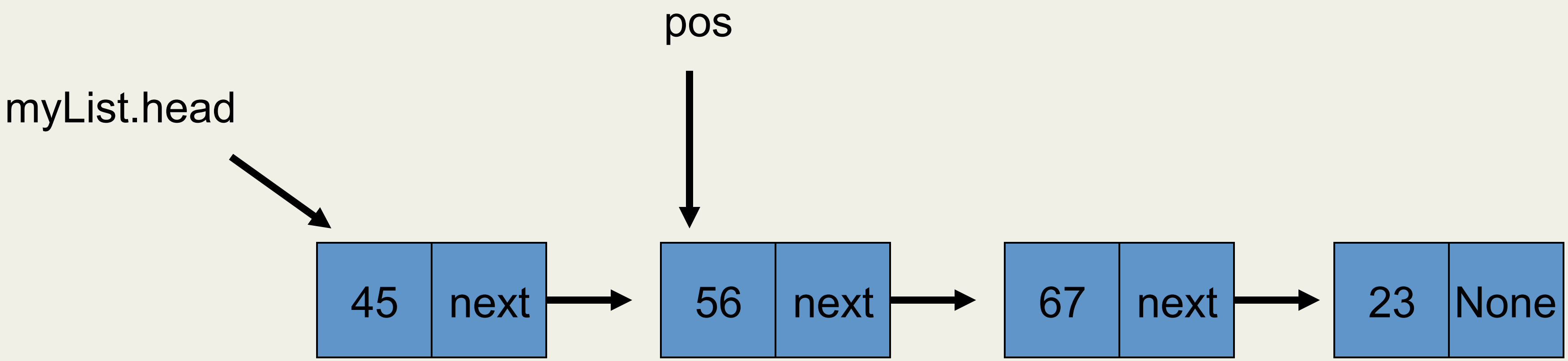
Linked lists

Removing items from the middle of a linked list.

`pos` references the item **before** the one we want to remove

```
def remove_item(self, pos):
    if pos.next is not None:
    pos.next = pos.next.next
    self.length = self.length – 1
```



Linked lists

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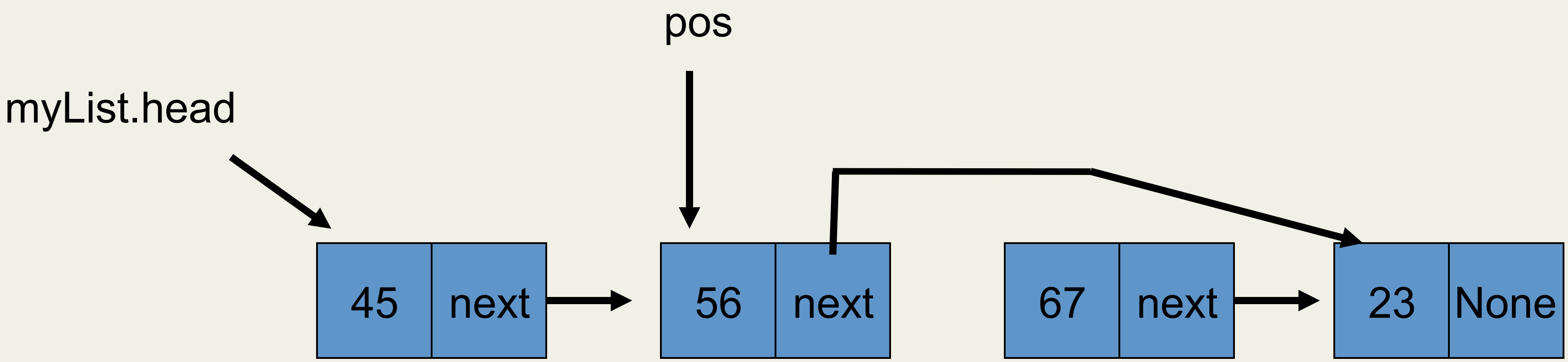
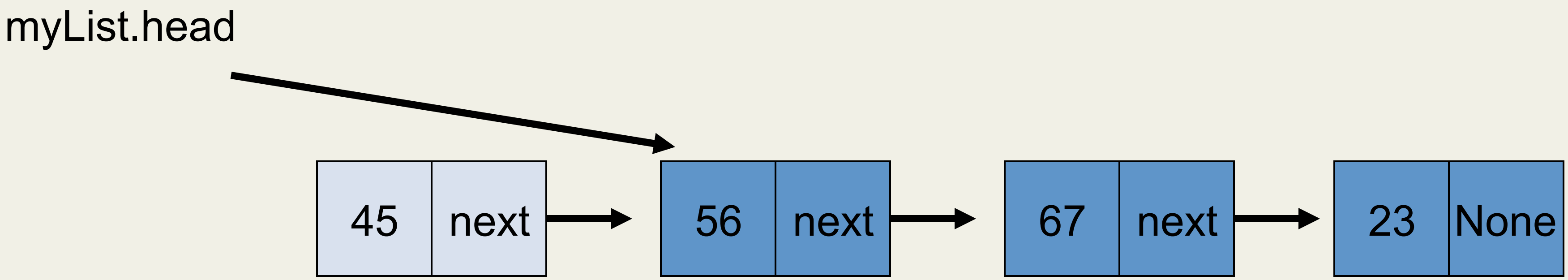


Linked lists

Removing items from the front of a linked list.

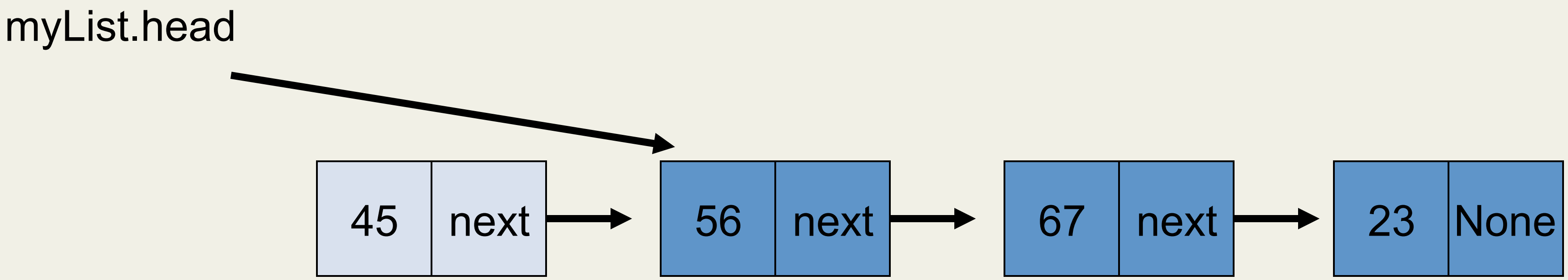
```
def remove_first(self):
    if self.head is not None:
        self.head = self.head.next
        self.length = self.length – 1
```



Linked lists

Removing items that we don’t want from a linked list.

```
def remove_items(self):
    while self.head is not None and self.head.baditem():
       remove_first(self)
    pred = self.head
    while pred is not None
        while pred.next is not None and pred.next.baditem():
                remove_item(self, pred)
          pred = pred.next
```



myList.head

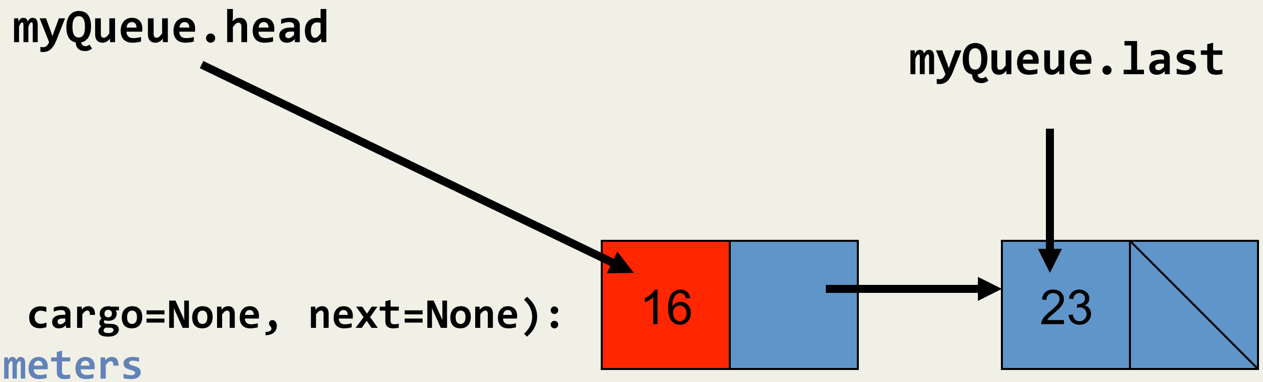
45 next

56 next

67 next

23 None

Implementing a queue



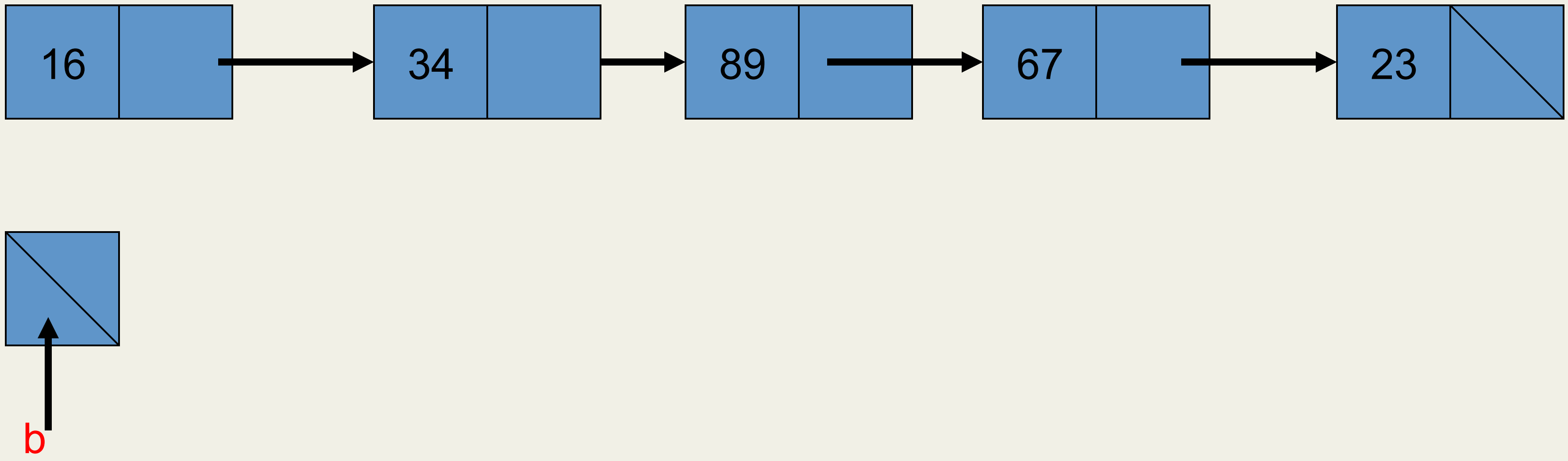
```
class Node:
     def __init__(self, cargo=None, next=None):
        # optional parameters
        self.cargo = cargo
        self.next  = next

 class ImprovedQueue:
     def __init__(self):
         self.length = 0
         self.head   = None
         self.last   = None

>>> myQueue = ImprovedQueue()
```

Reversing a queue

```
def reverse(self):
    b = None
    t = self.head
```



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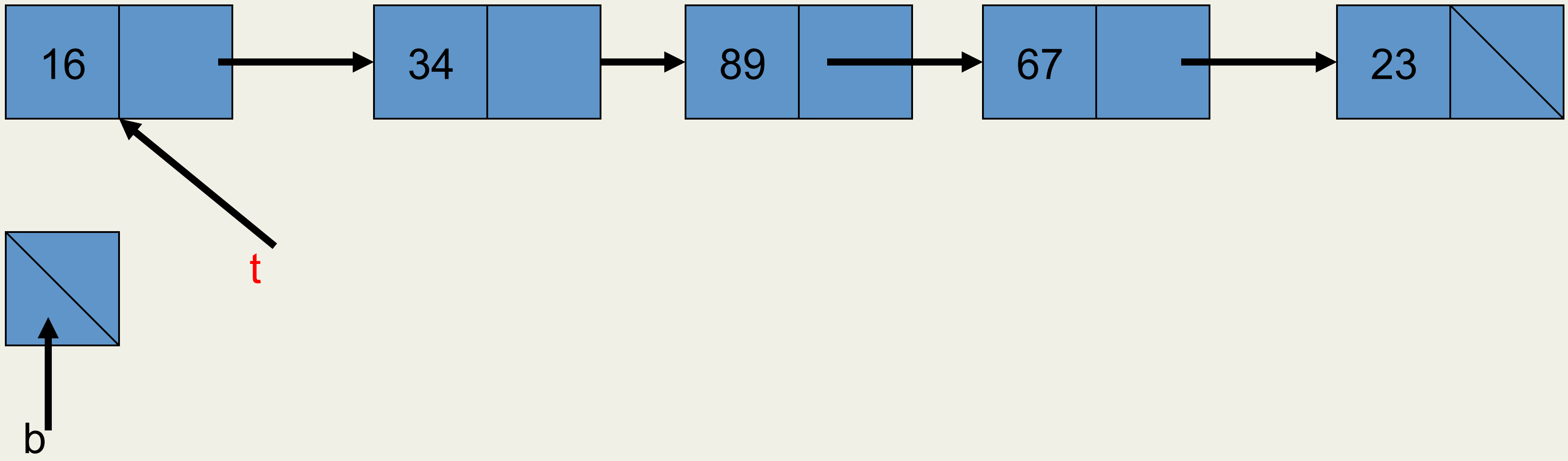
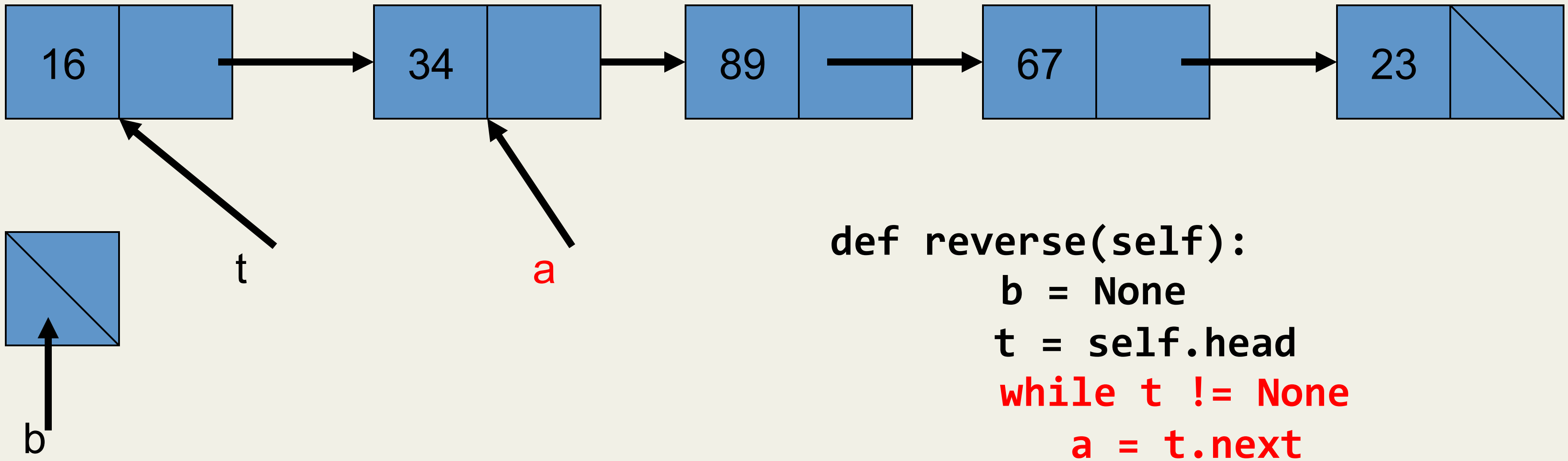
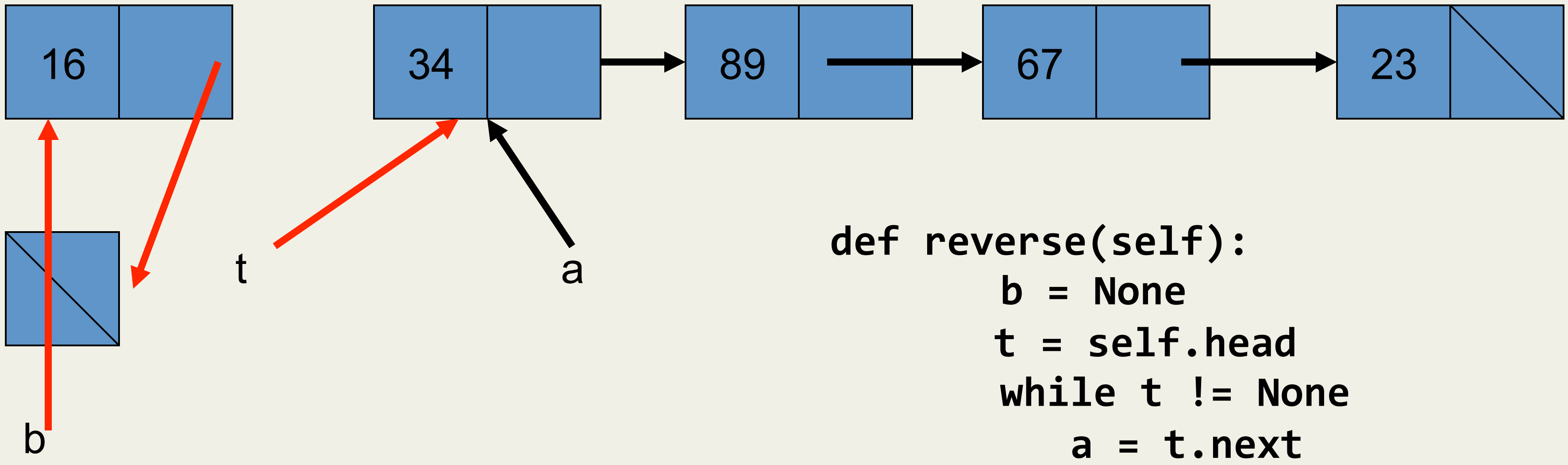


Reversing a queue



```
def reverse(self):
        b = None
        t = self.head
        while t != None
            a = t.next
            t.next = b
            b = t
            t = a
```

Reversing a queue



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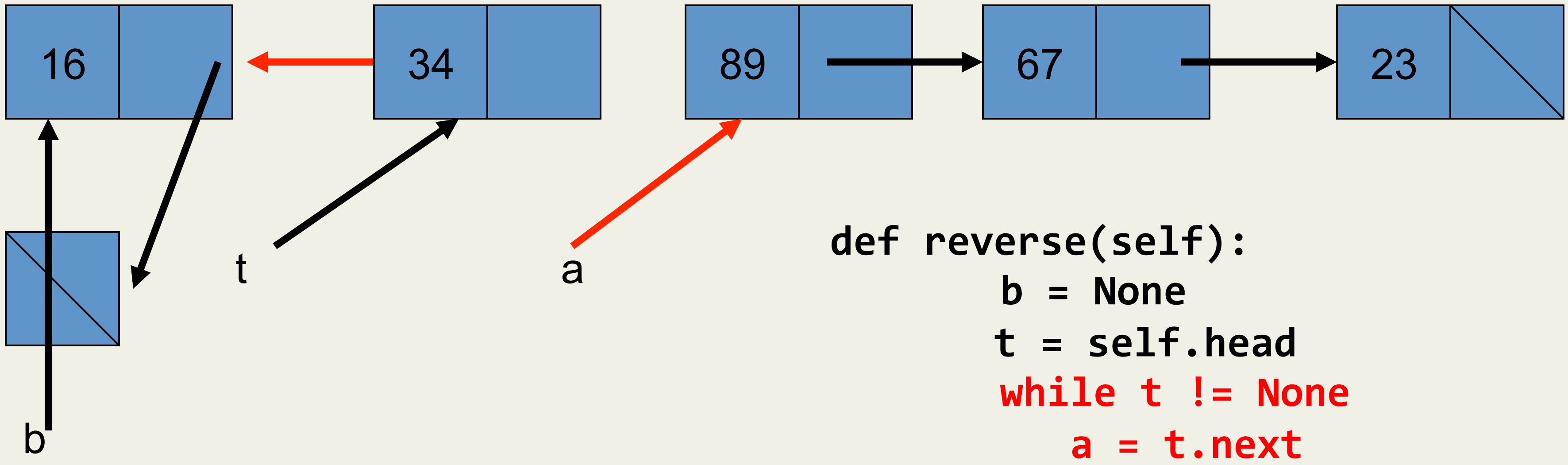

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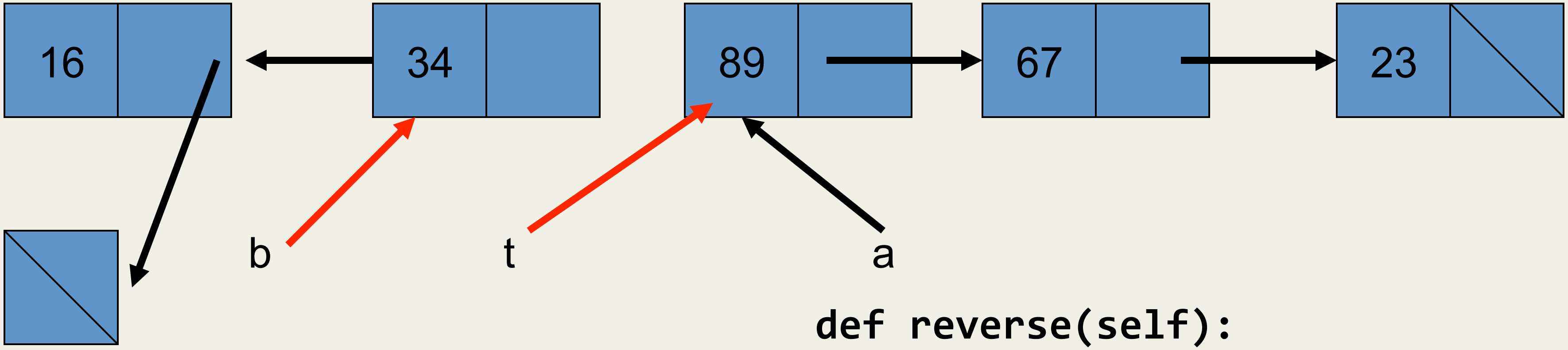

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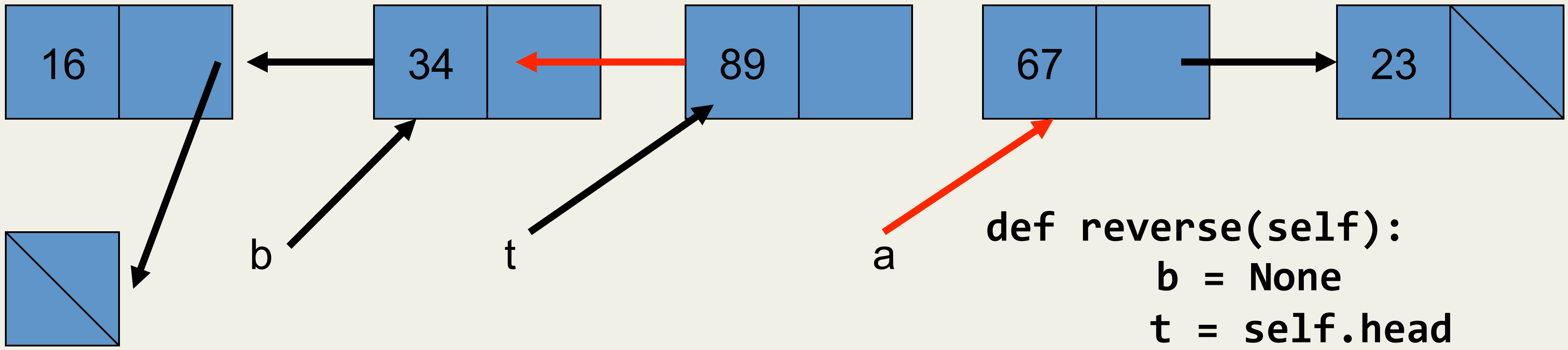

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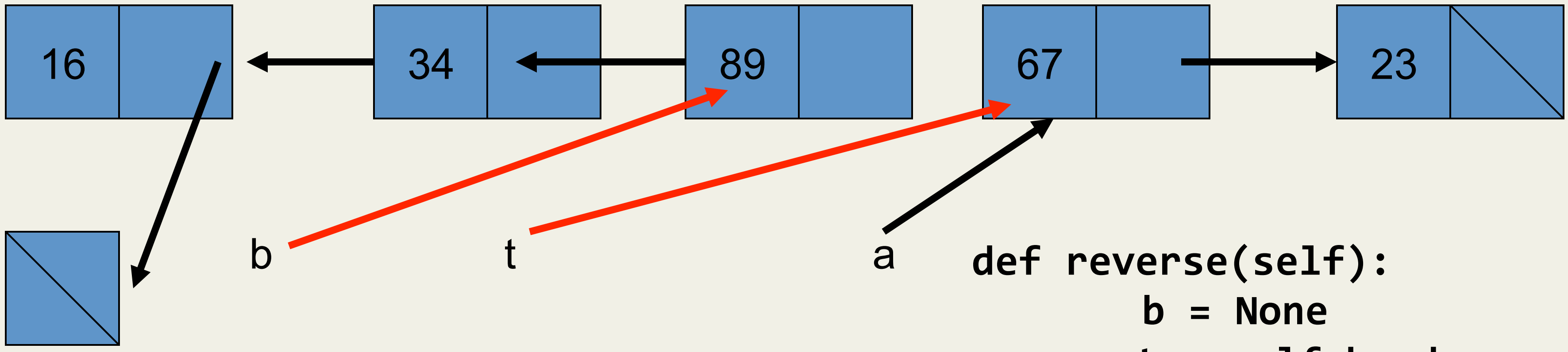

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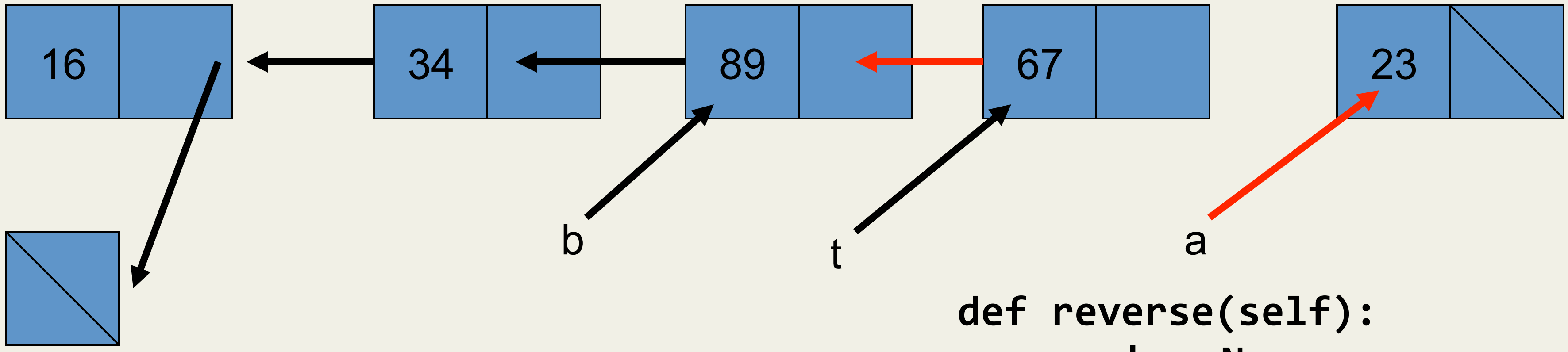

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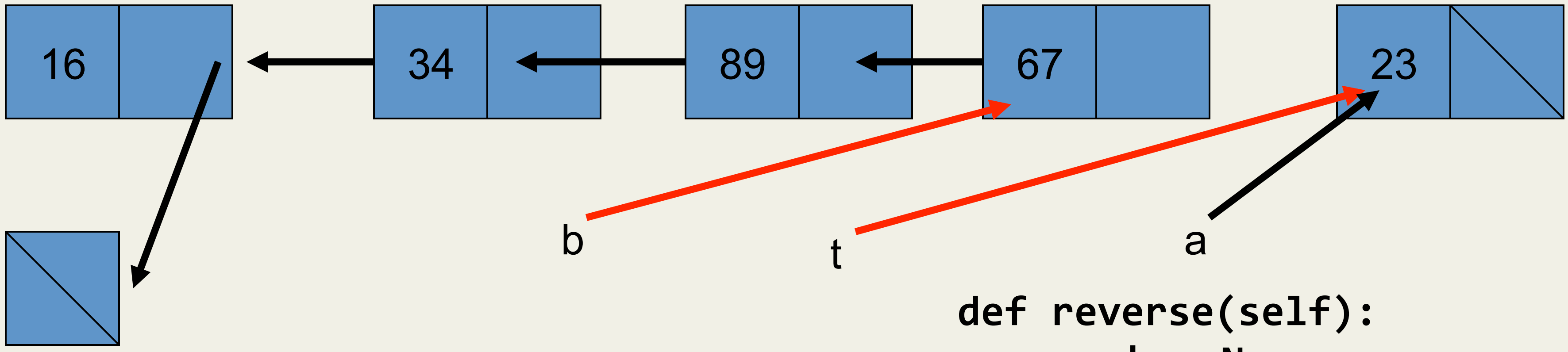

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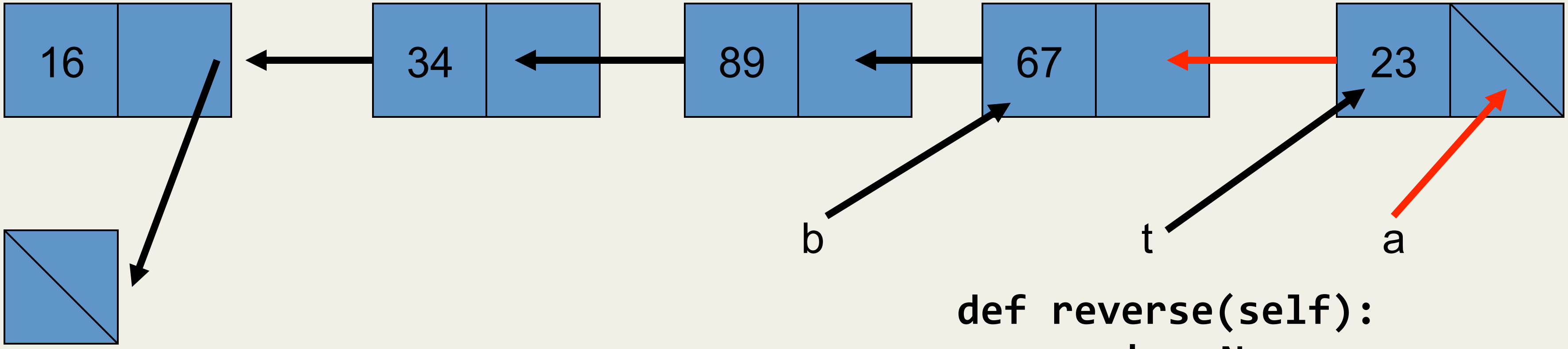

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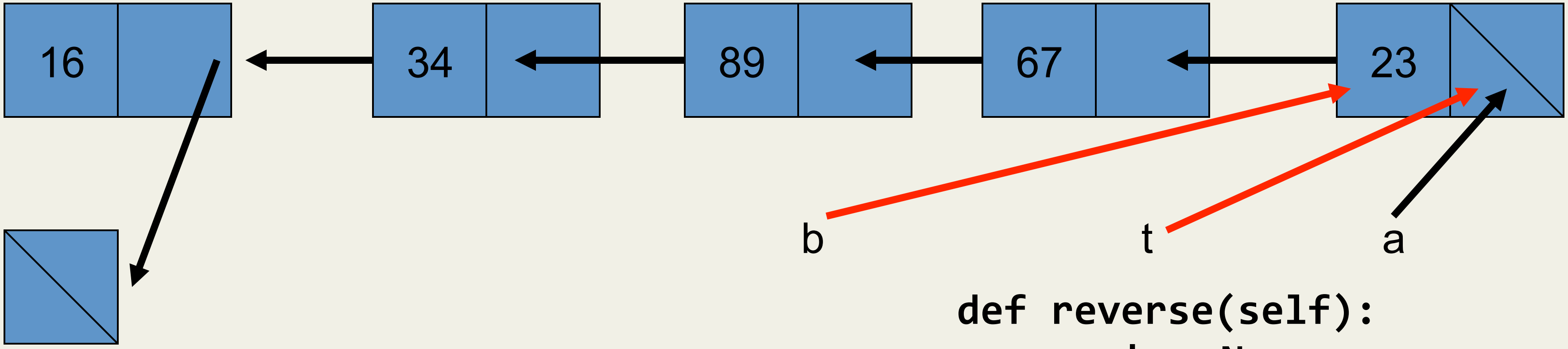

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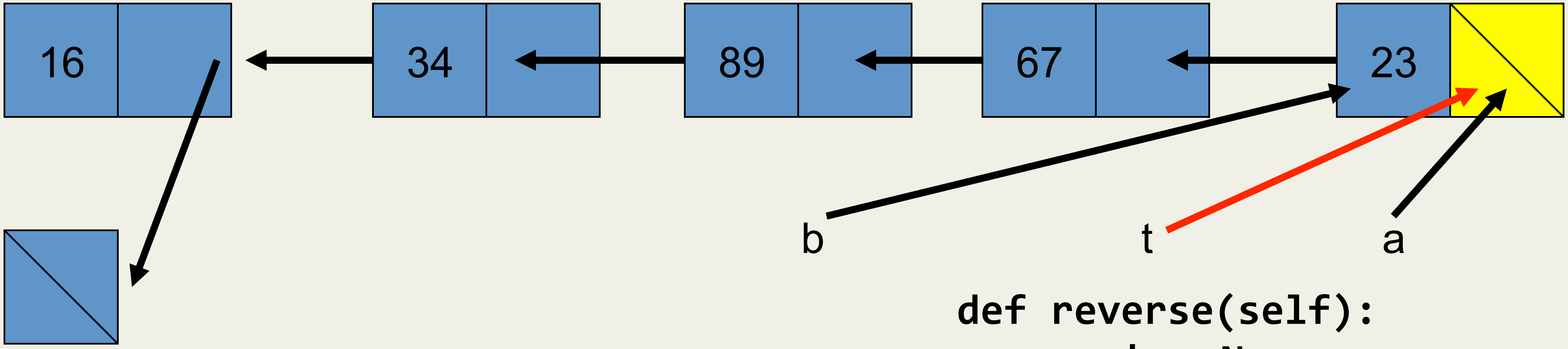

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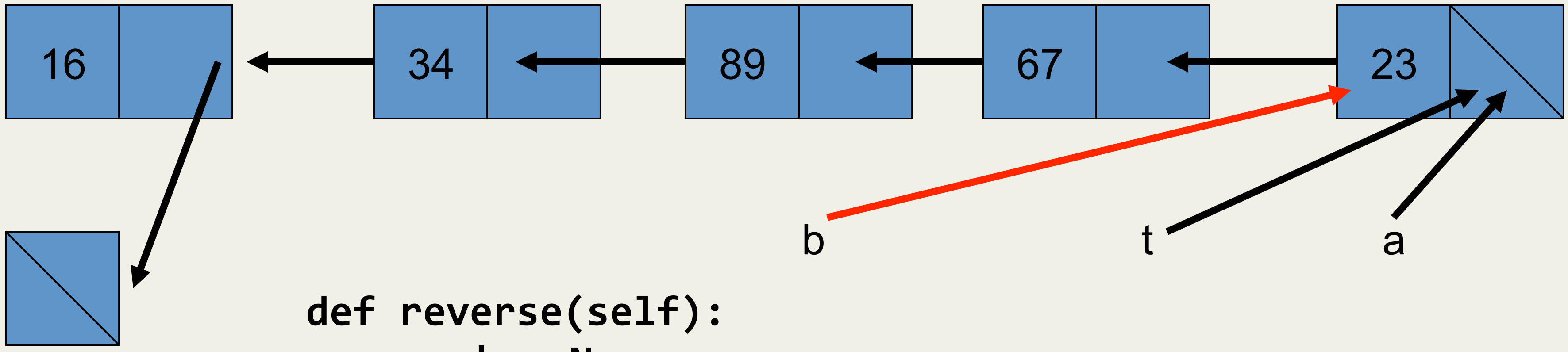

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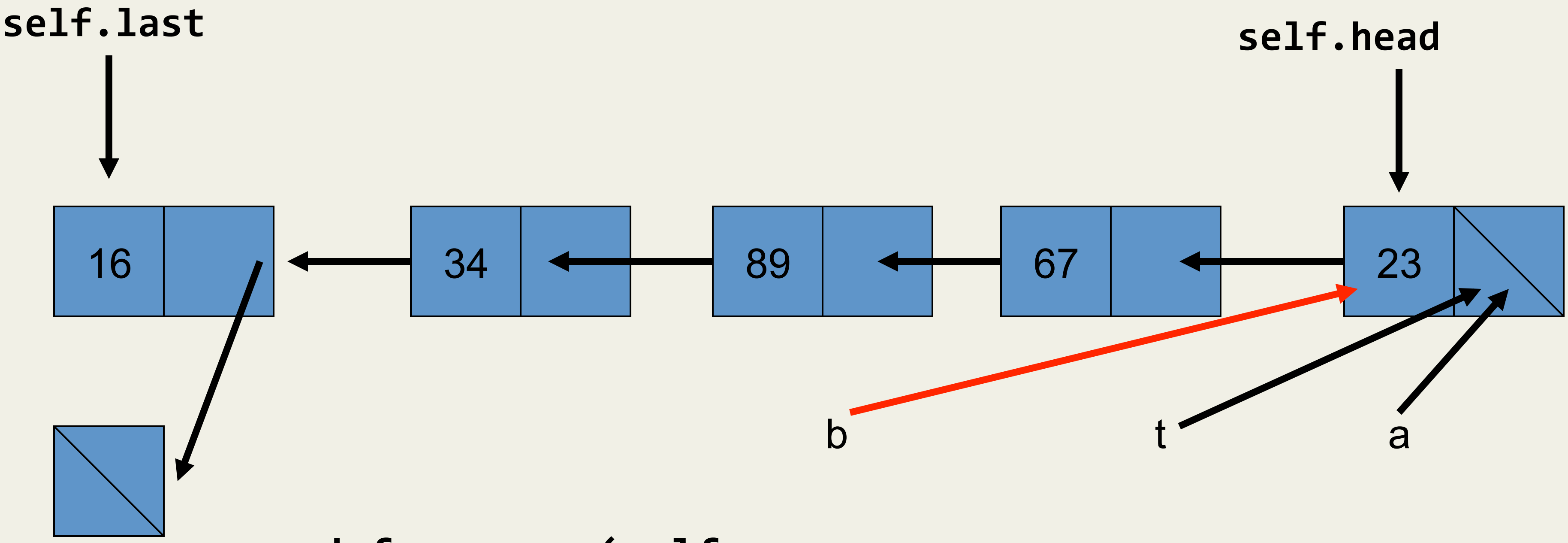

```
def reverse(self:
        ...
        self.last = self.head
        self.head = b
```