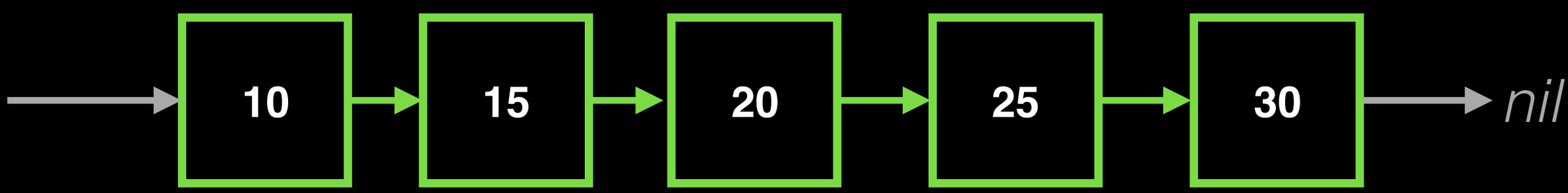
Fine-Grained & Lock-Free Skip List

Alec Bargas, Julian Domingo, Jacob Ingalls, John Starich

A what?

It is like a **Sorted, Tiered** Linked List



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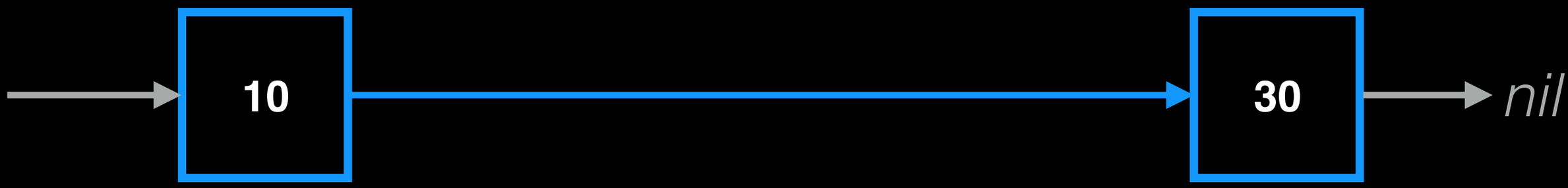
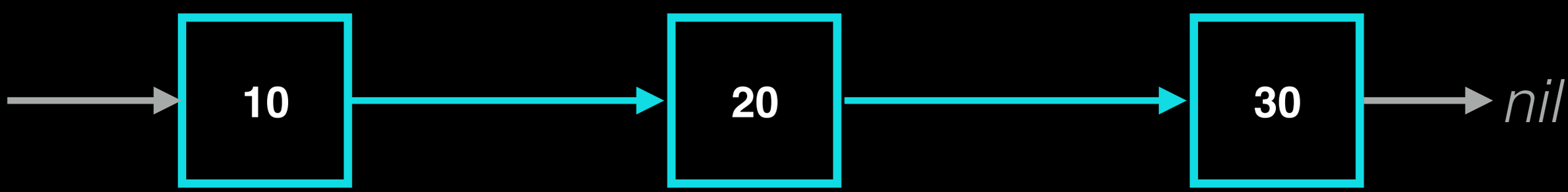
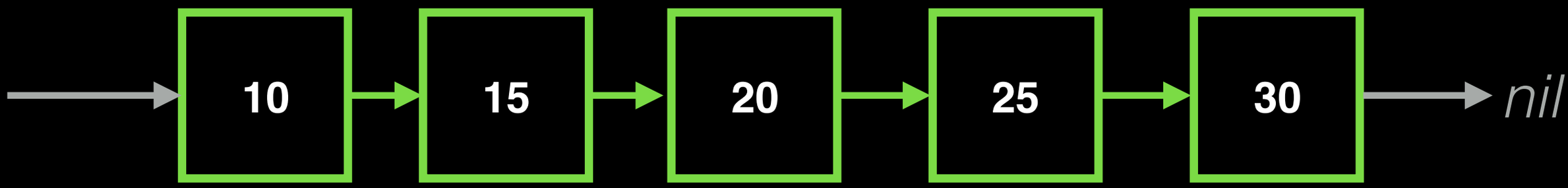
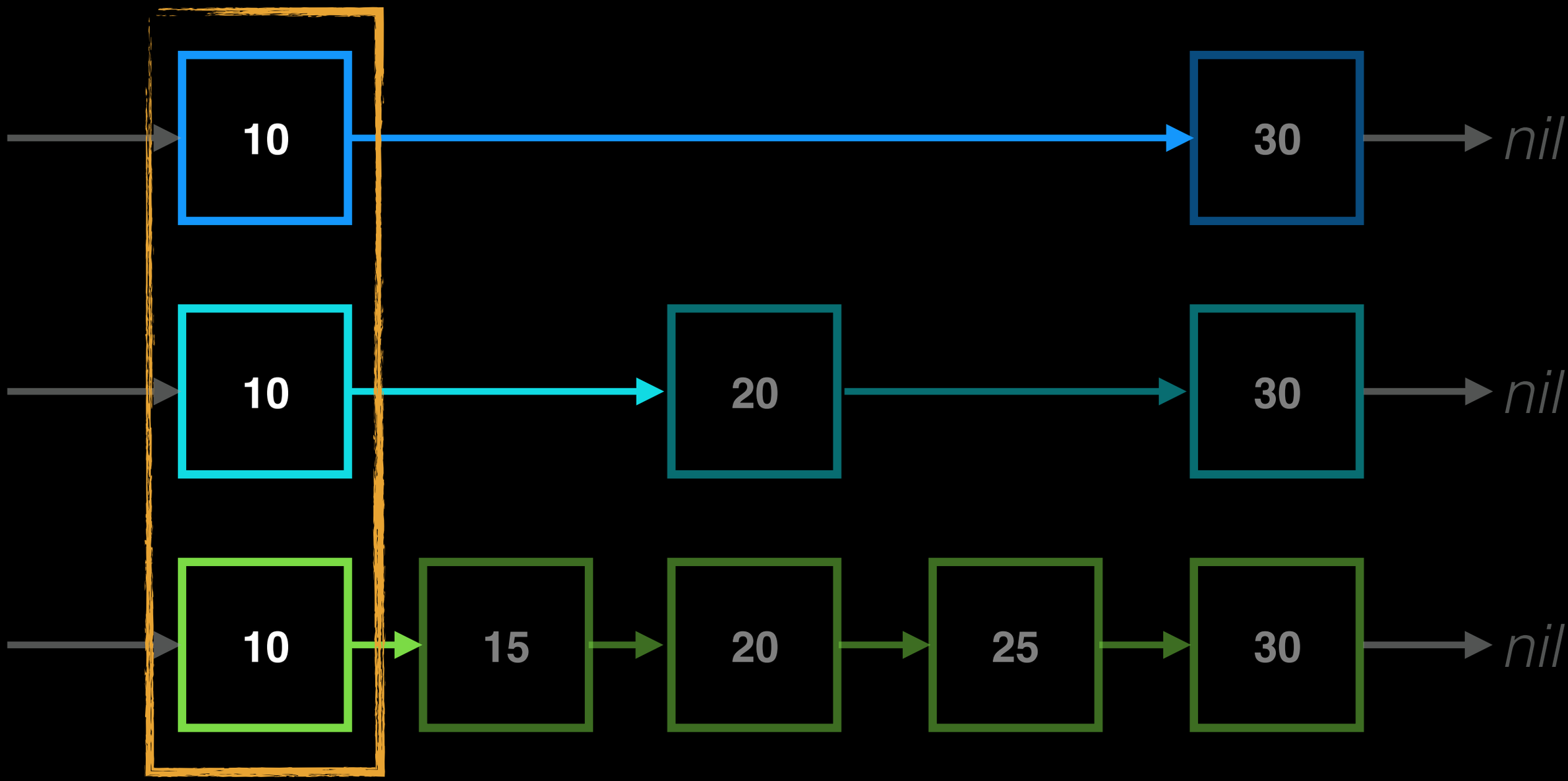






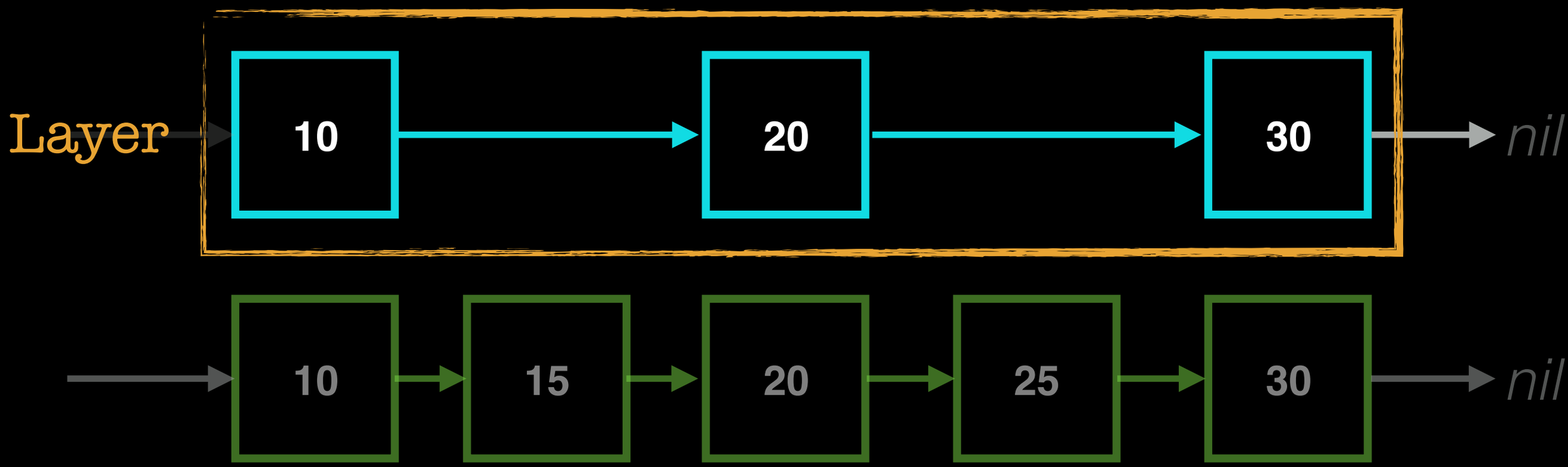
A what?

It is like a **Sorted, Tiered** Linked List



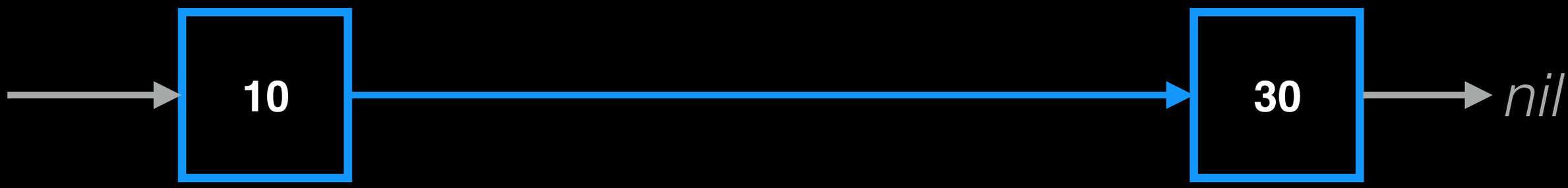
A what?

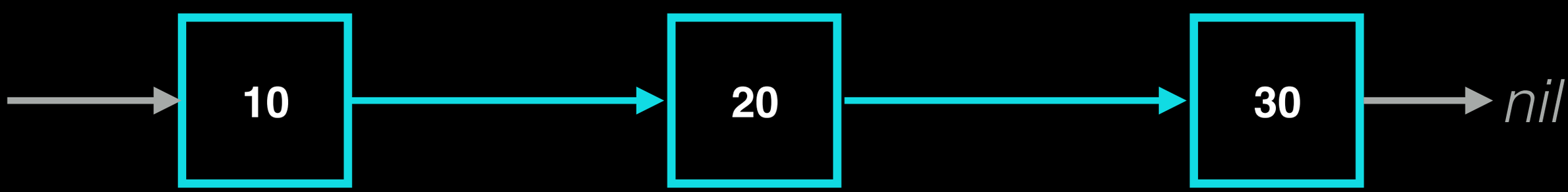
It is like a **Sorted, Tiered** Linked List

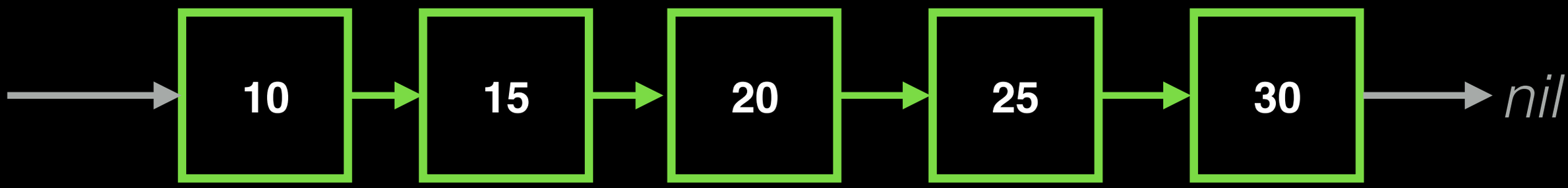


A what?

It is like a **Sorted, Tiered** Linked List

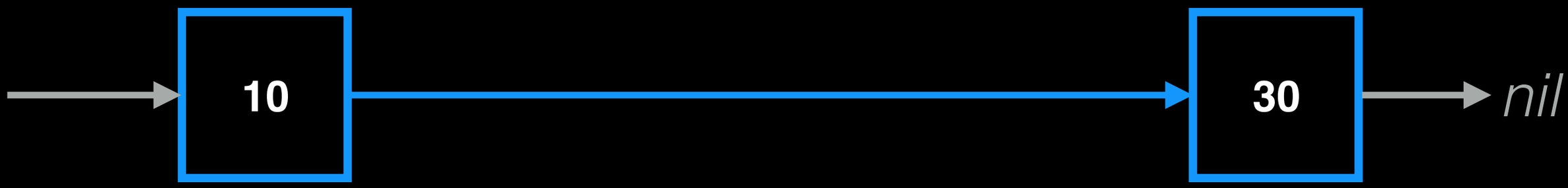


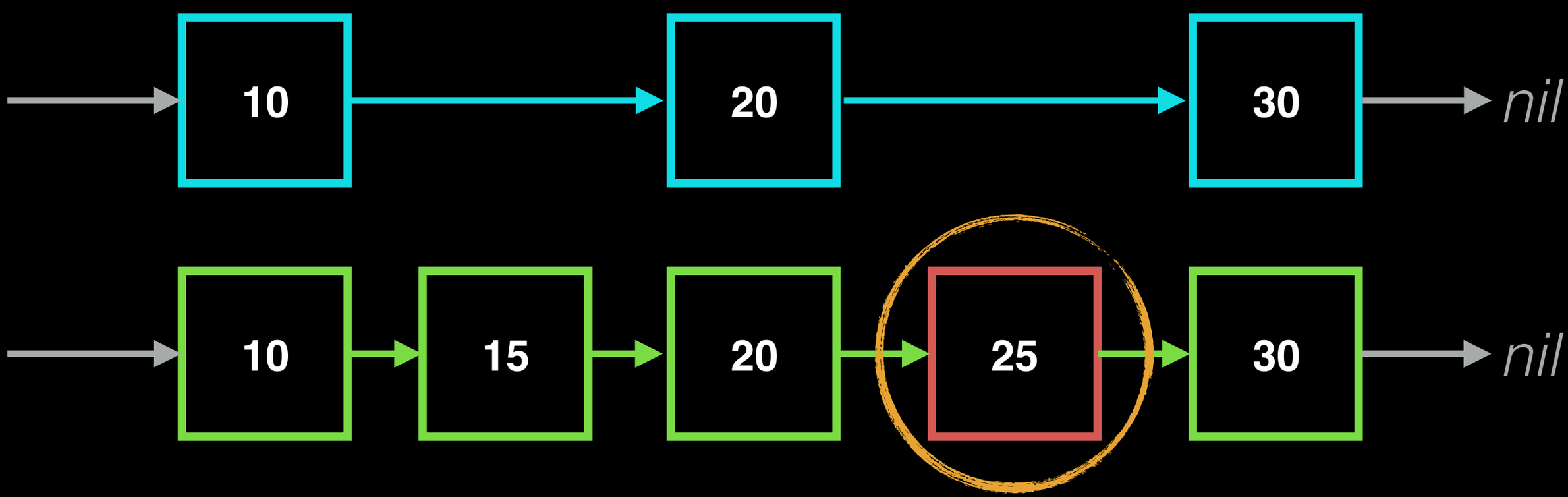




Search

Θ(Log(n))

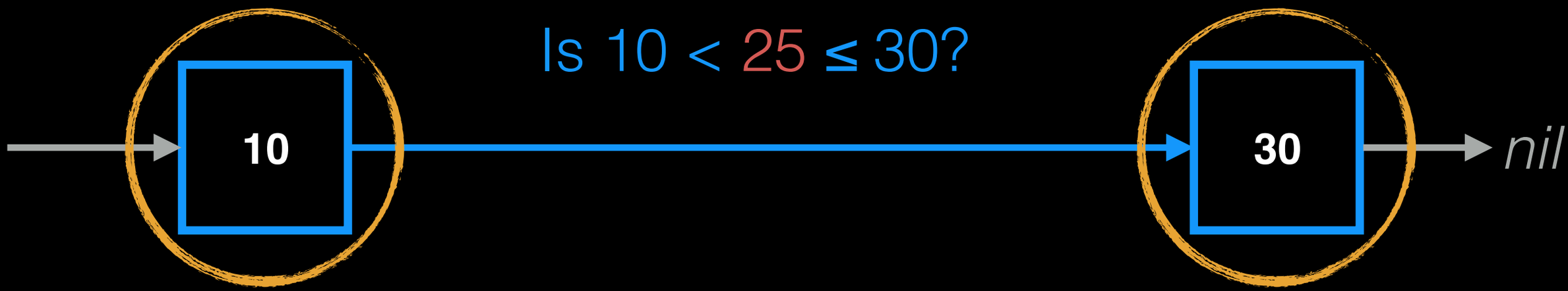


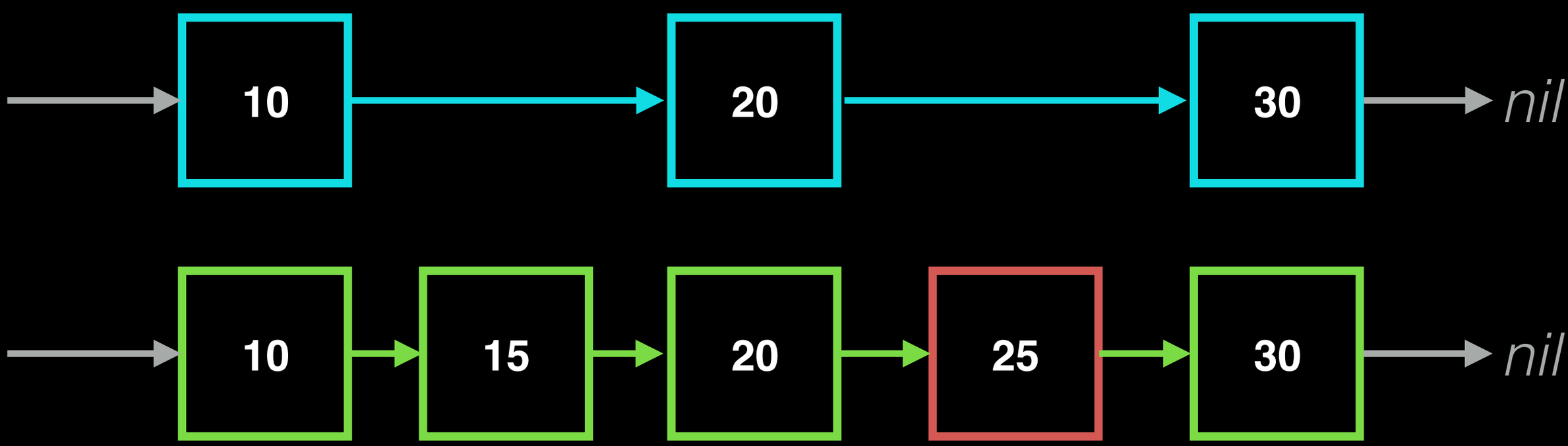


Search

Θ(Log(n))

Is 10 < 25 ≤ 30?

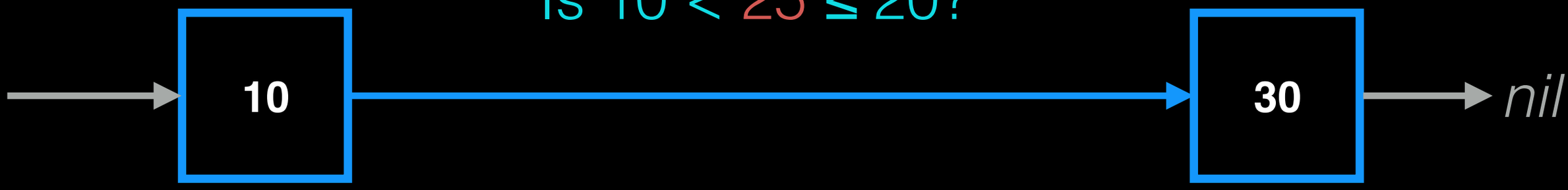


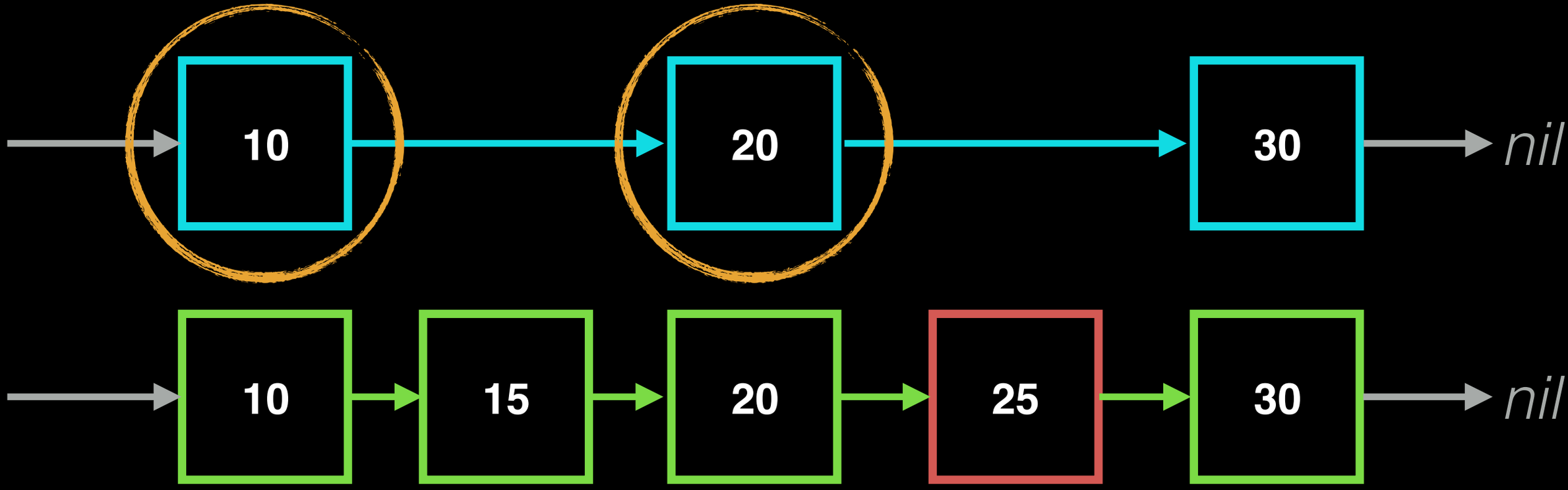


Search

Θ(Log(n))

Is 10 < 25 ≤ 20?

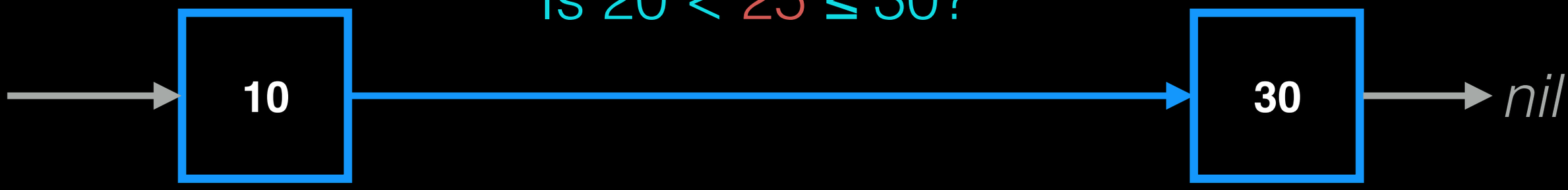


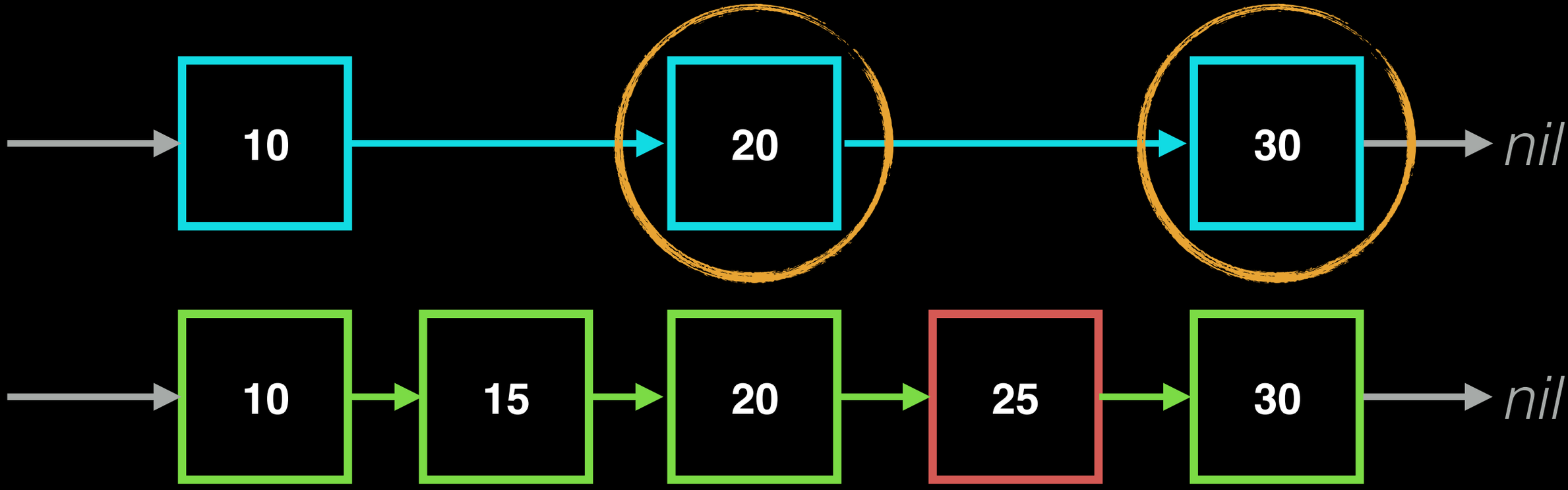


Search

Θ(Log(n))

Is 20 < 25 ≤ 30?

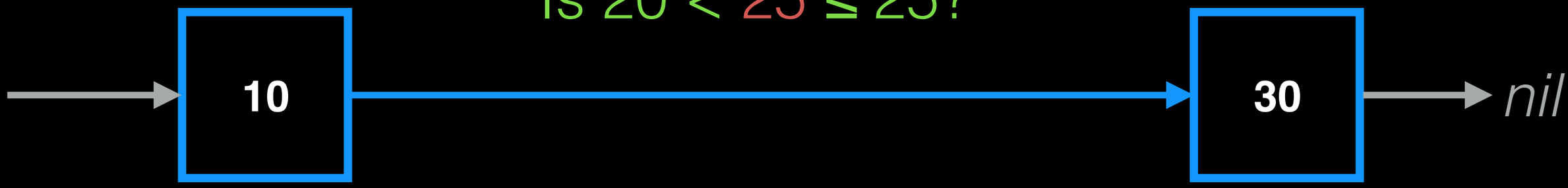


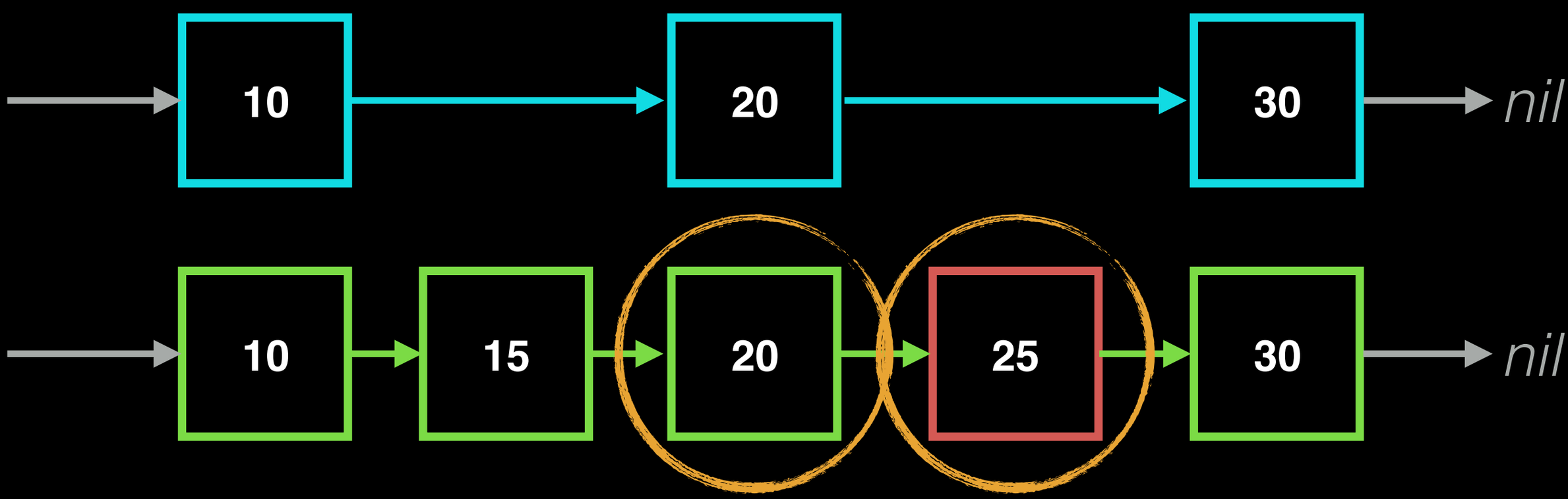


Search

Θ(Log(n))

Is 20 < 25 ≤ 25?

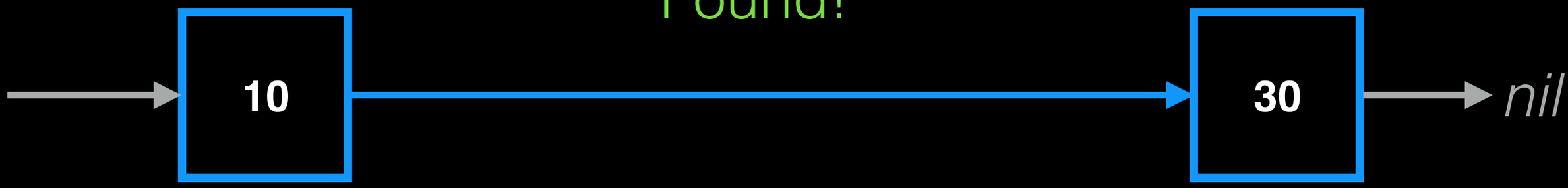


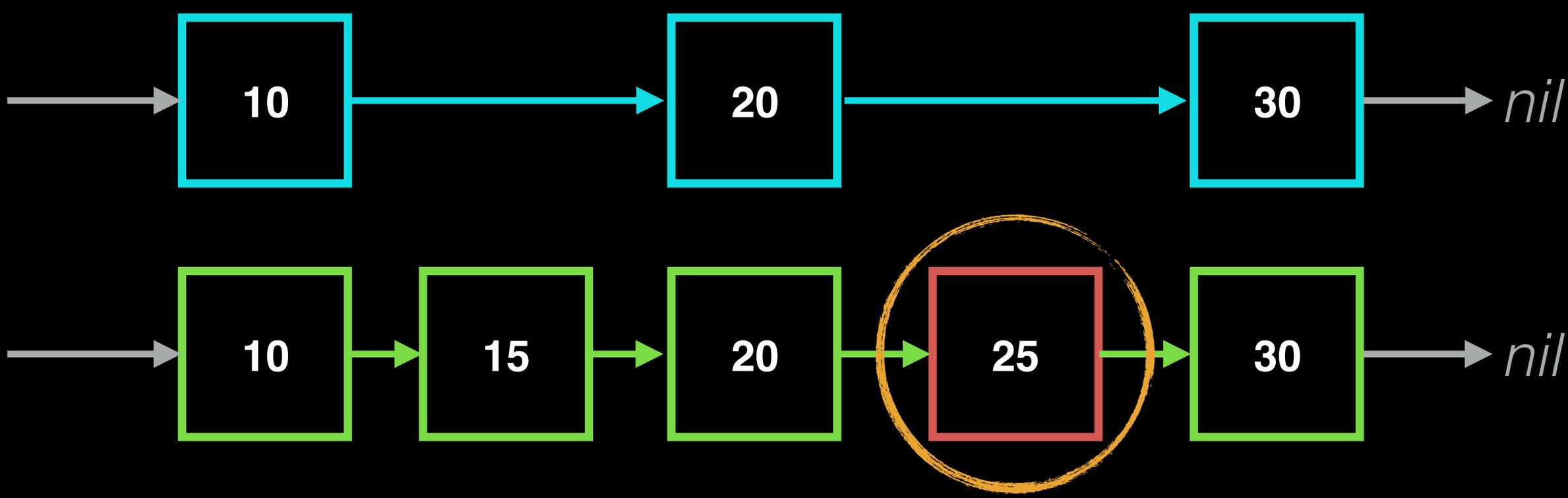


Search

Θ(Log(n))

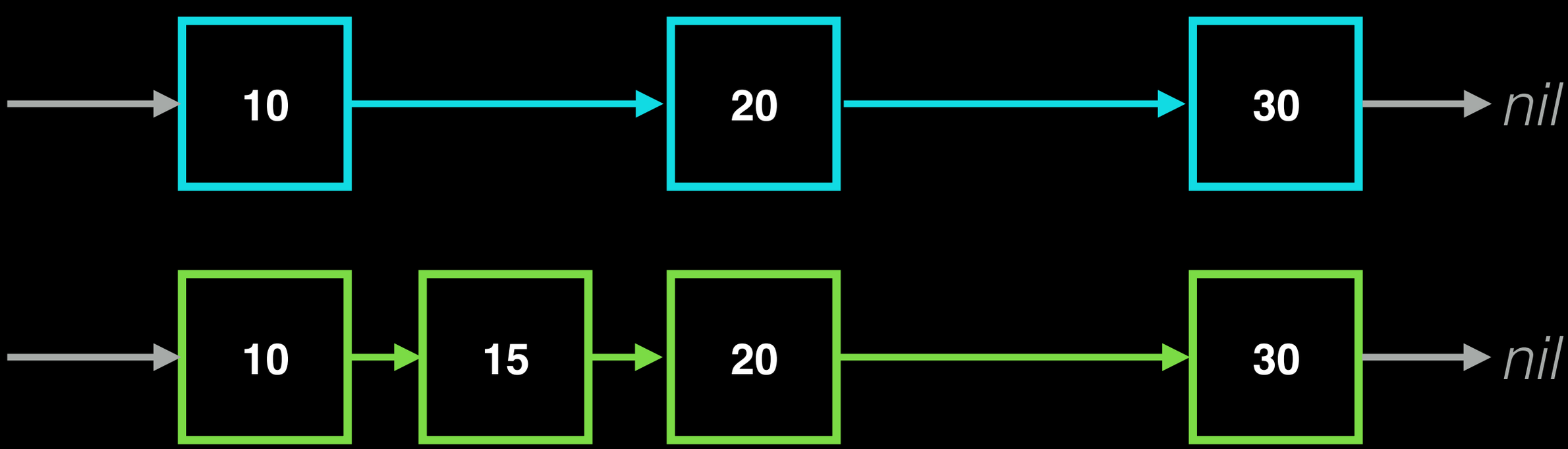
Found!





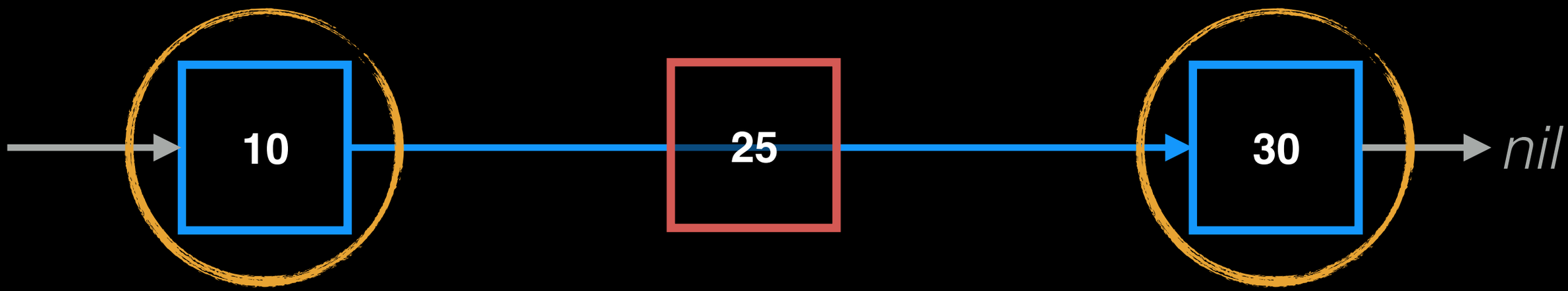
Insert

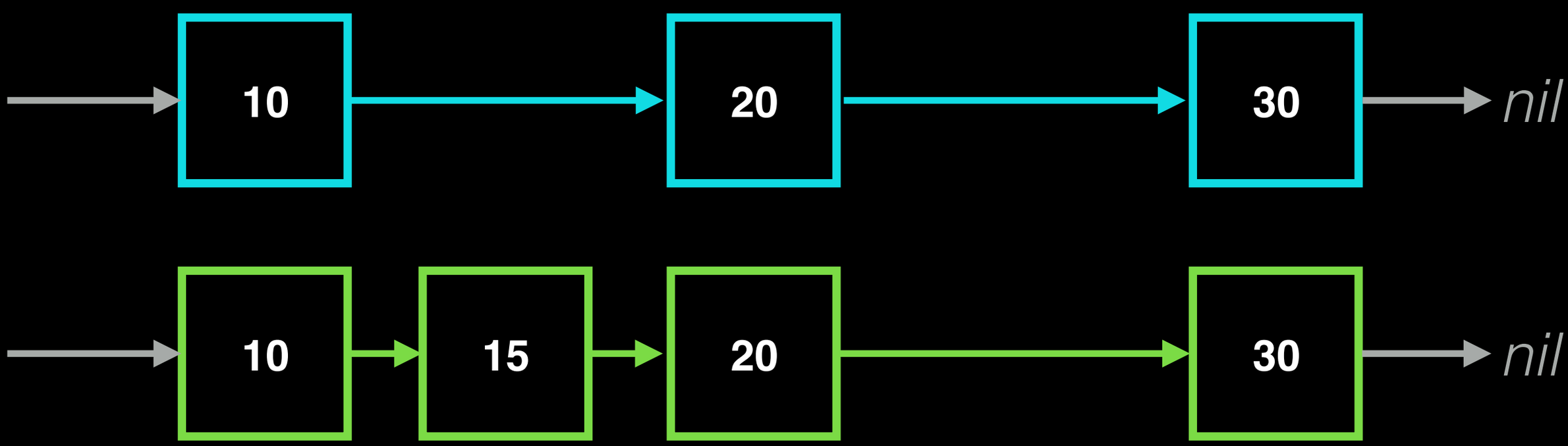
Θ(Log(n))



Insert

Θ(Log(n))

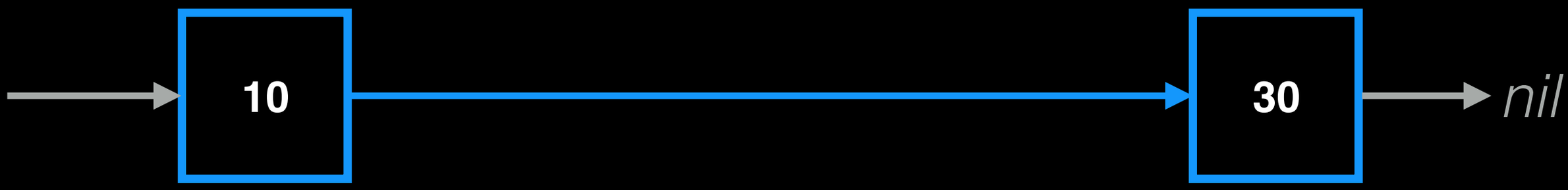


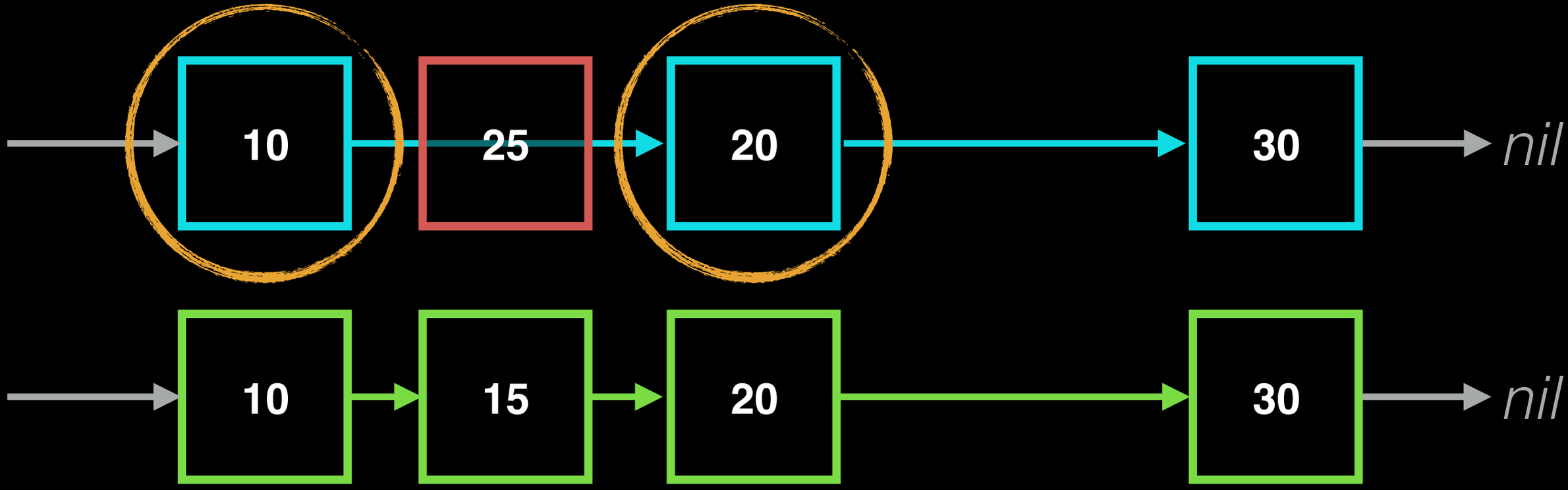


Target

Insert

Θ(Log(n))

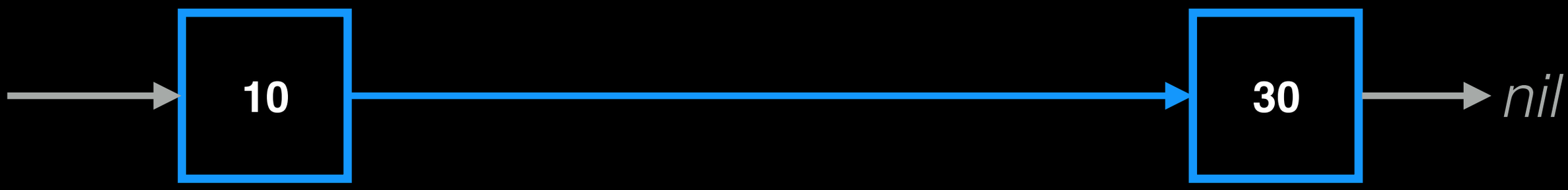


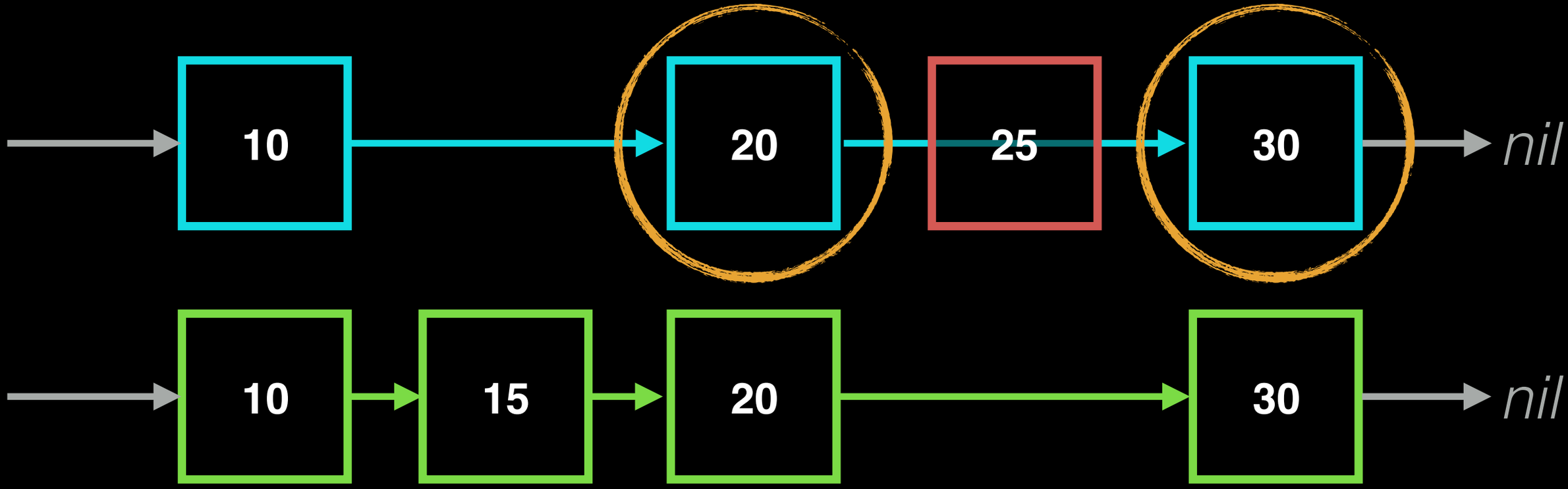


Target

Insert

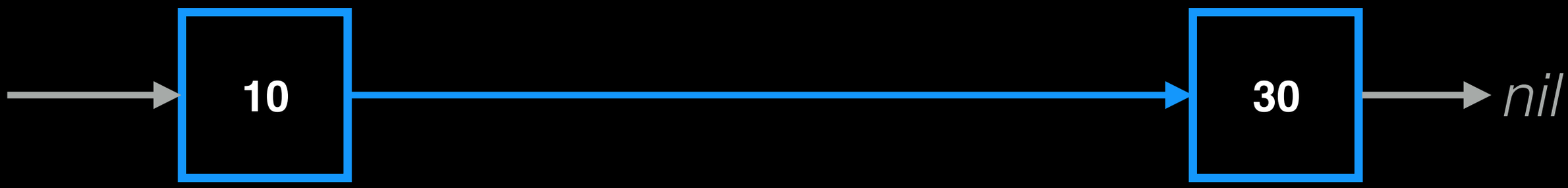
Θ(Log(n))

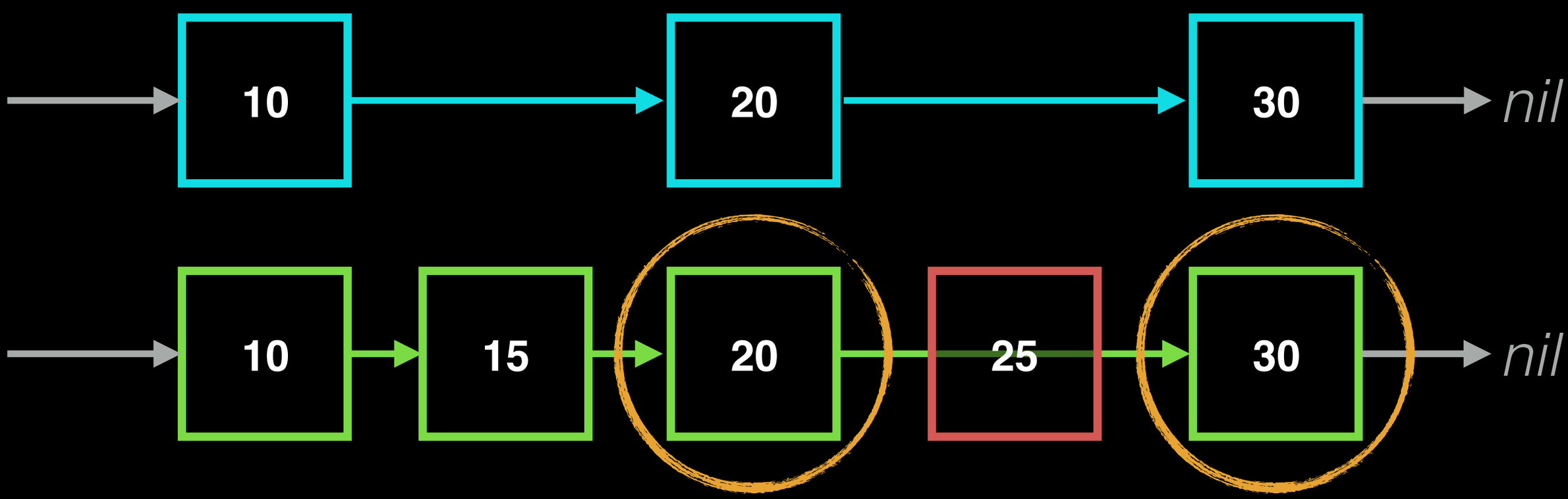




Insert

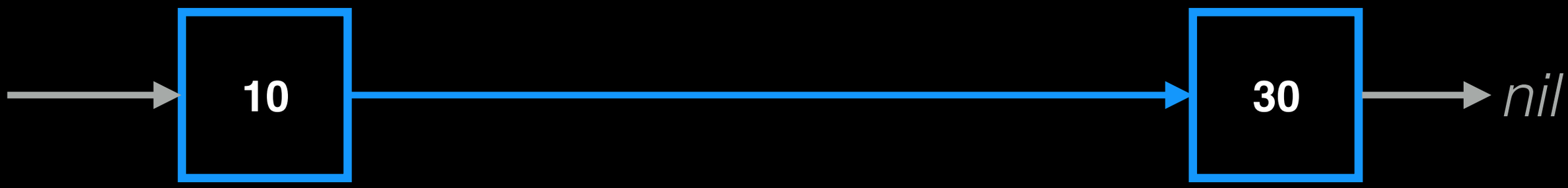
Θ(Log(n))

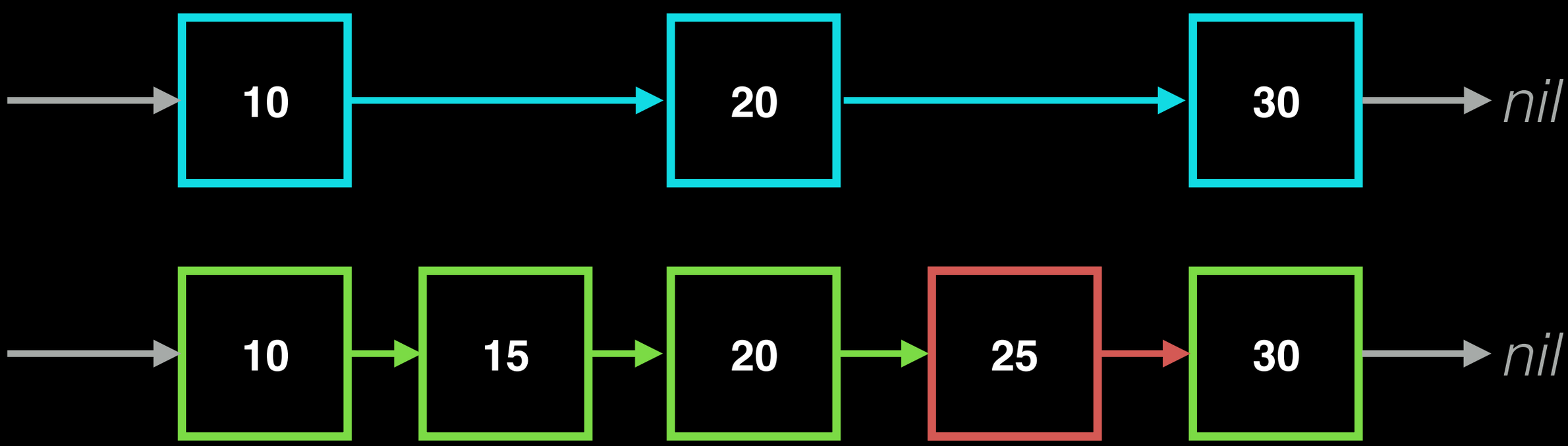




Insert

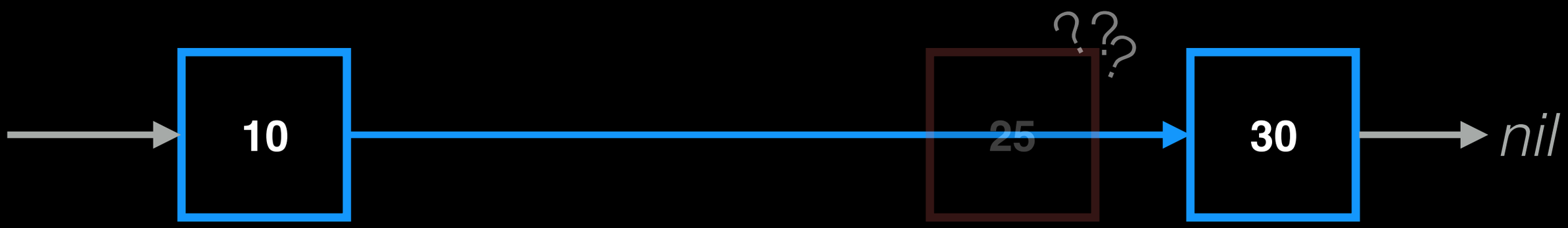
Θ(Log(n))

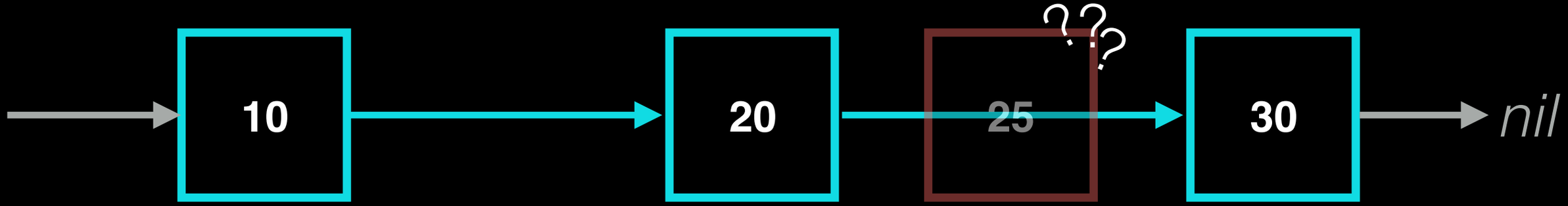


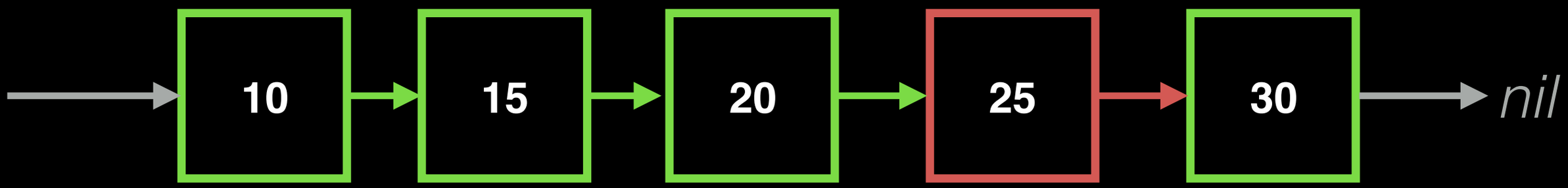


Insert

Θ(Log(n))



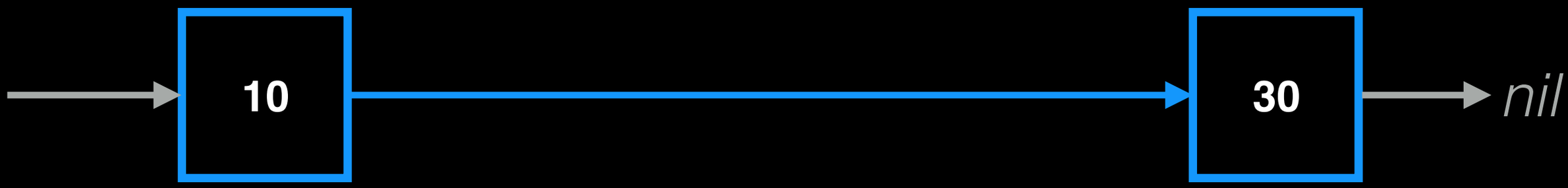


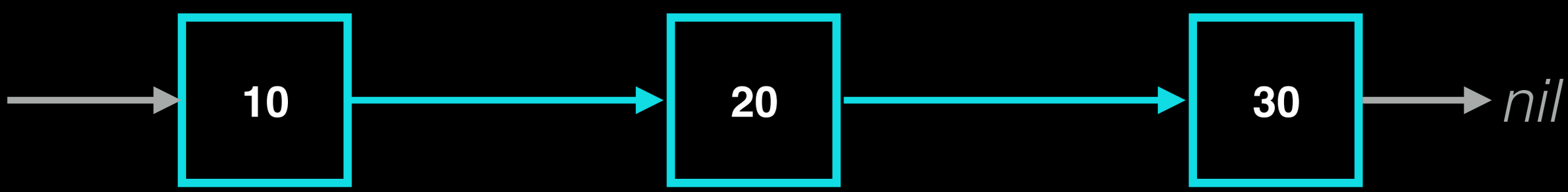


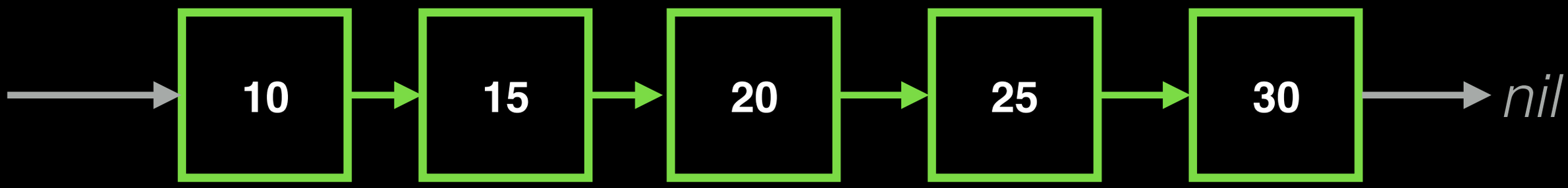
Target

Insert

Θ(Log(n))

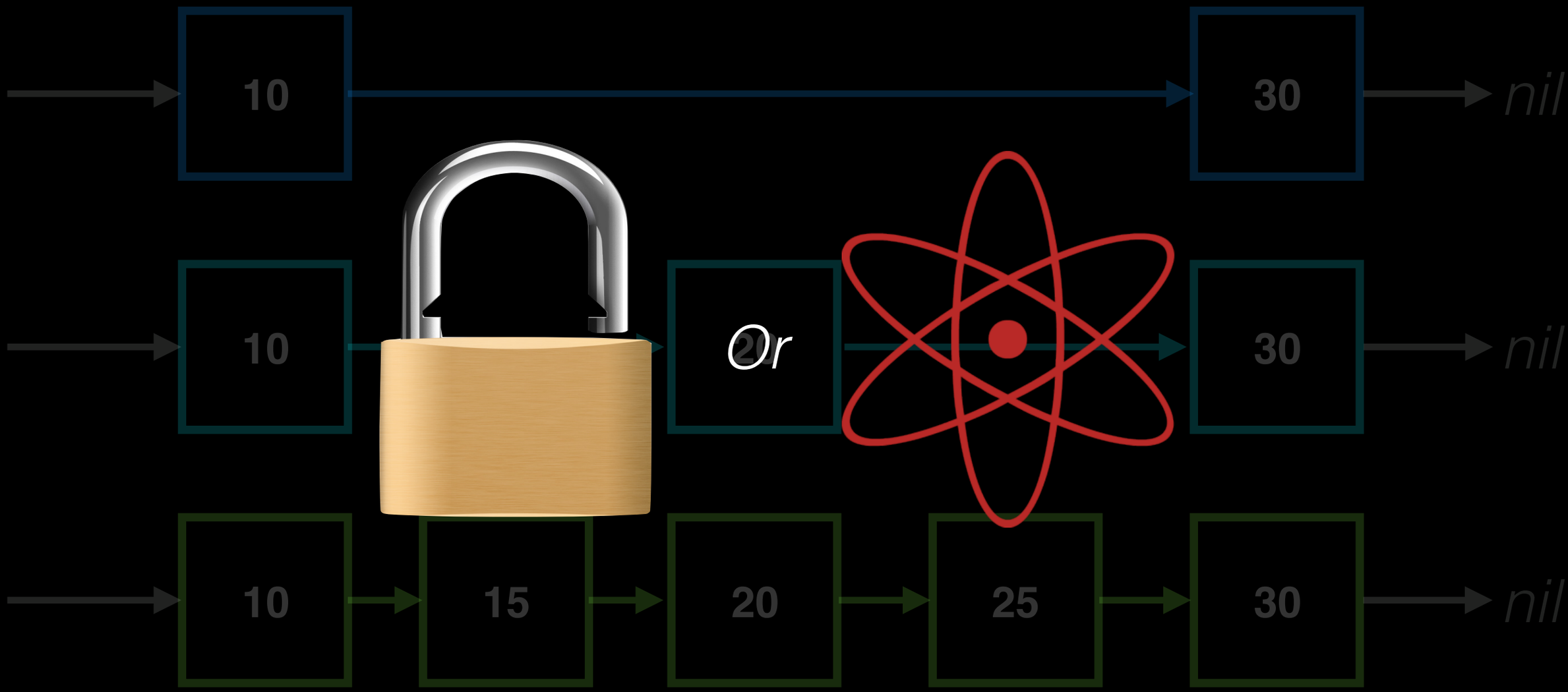






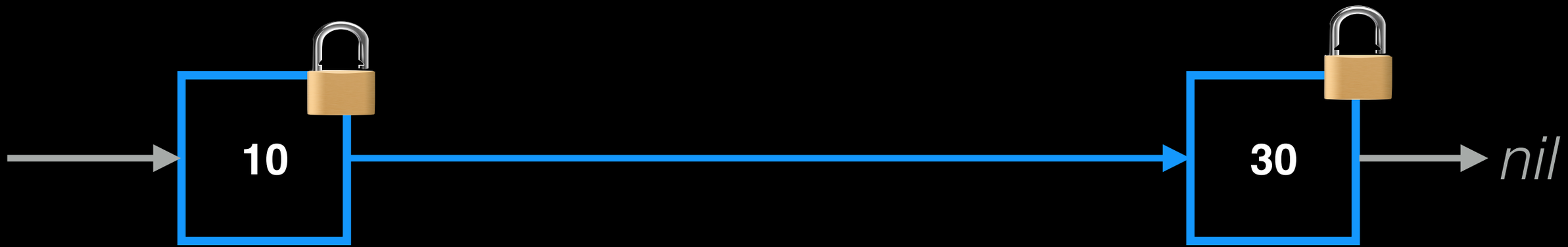
Concurrency

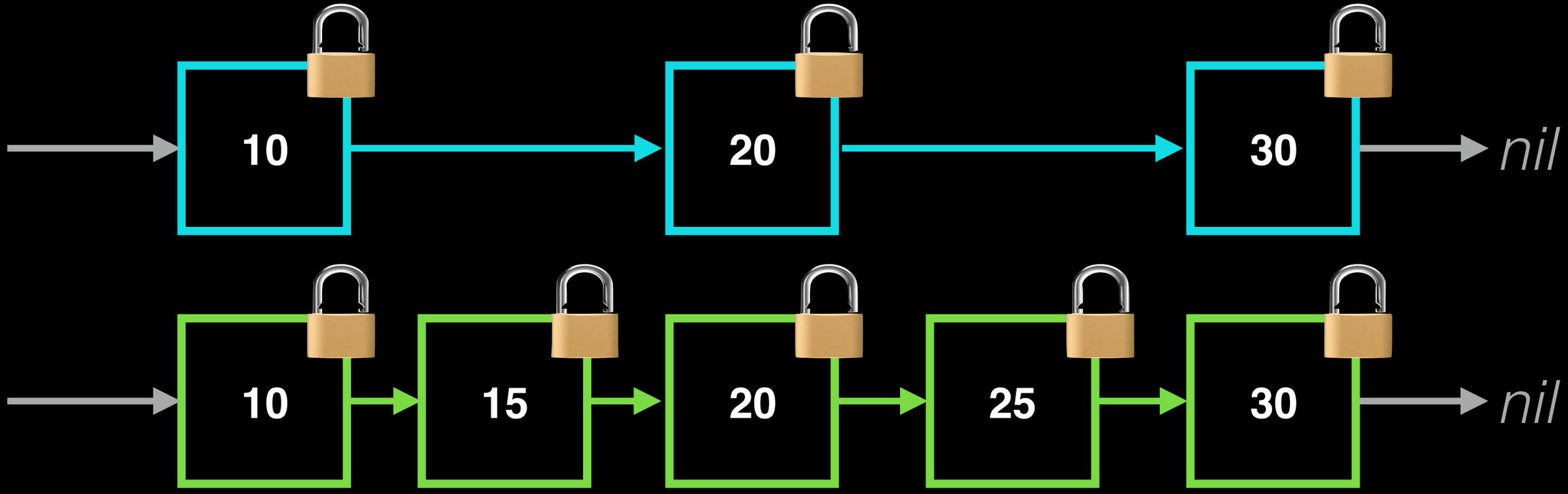
Fine-Grained or Lock-Free



Concurrency

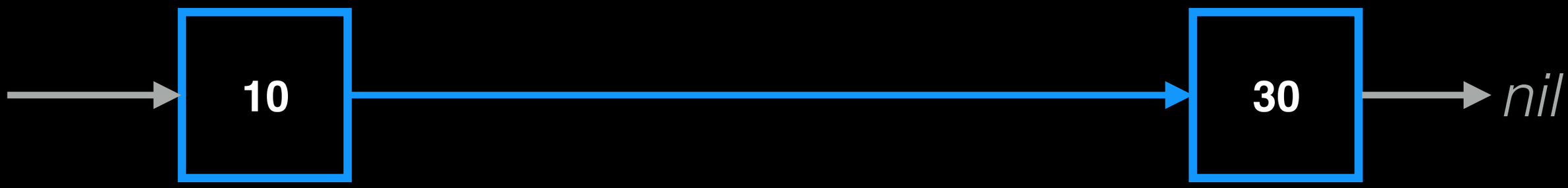
Fine-Grained

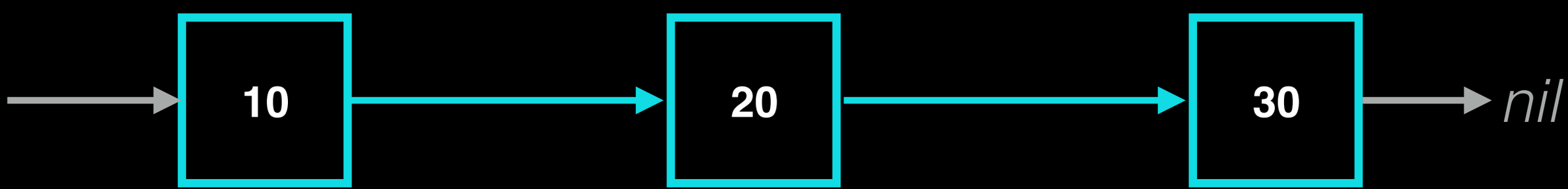


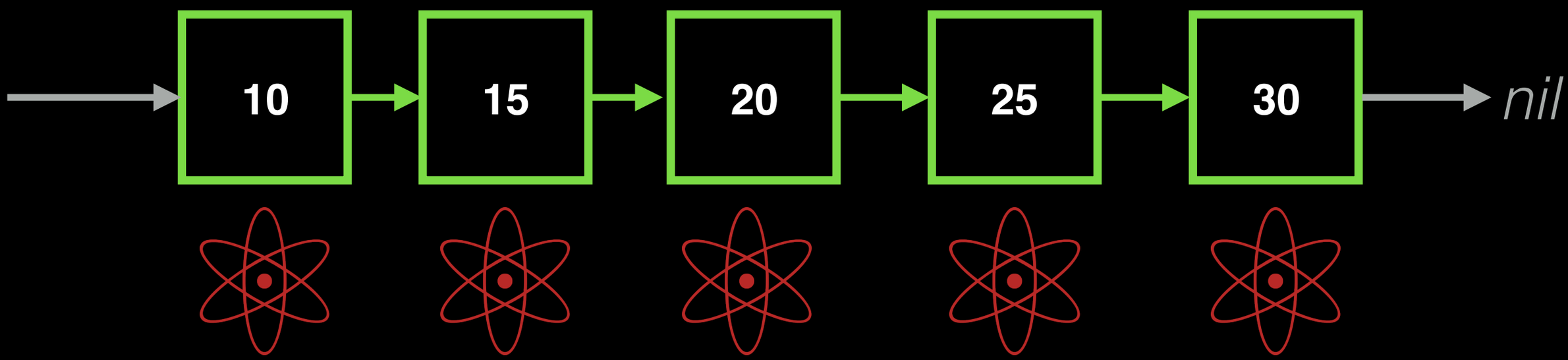


Concurrency

Lock-Free

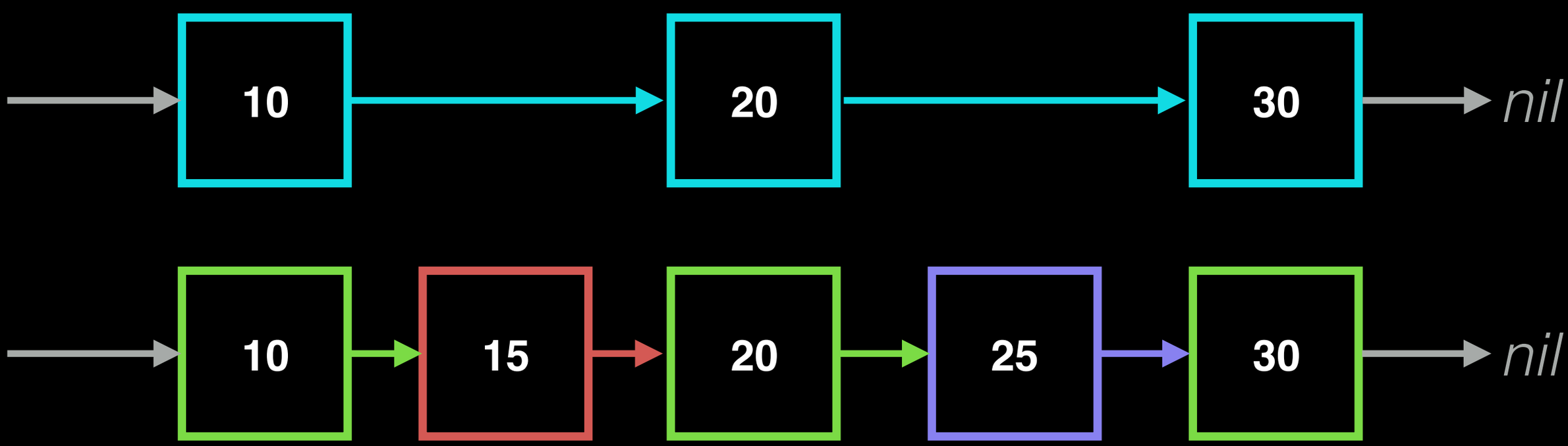






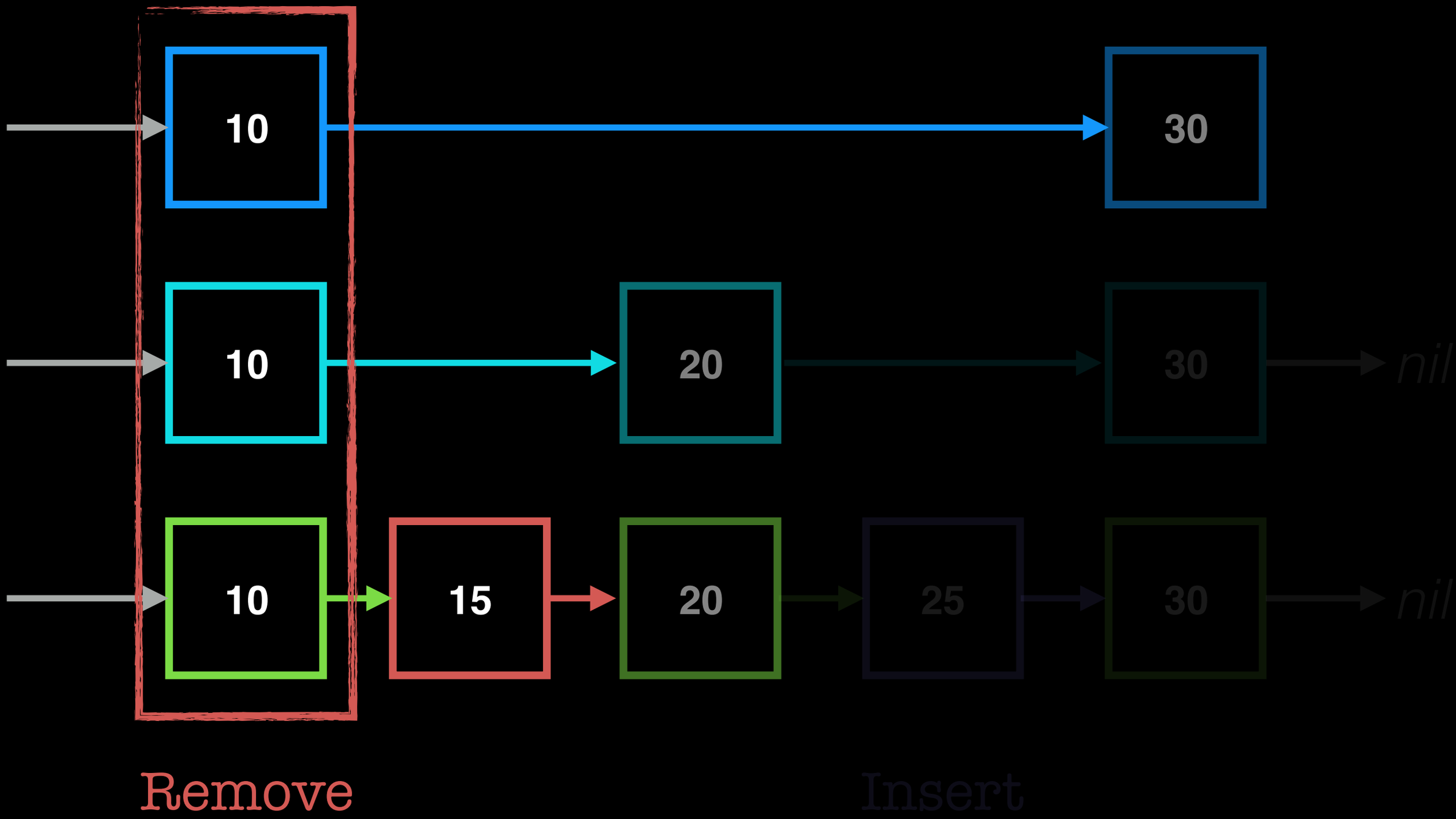
Concurrency

Concurrent Modifications



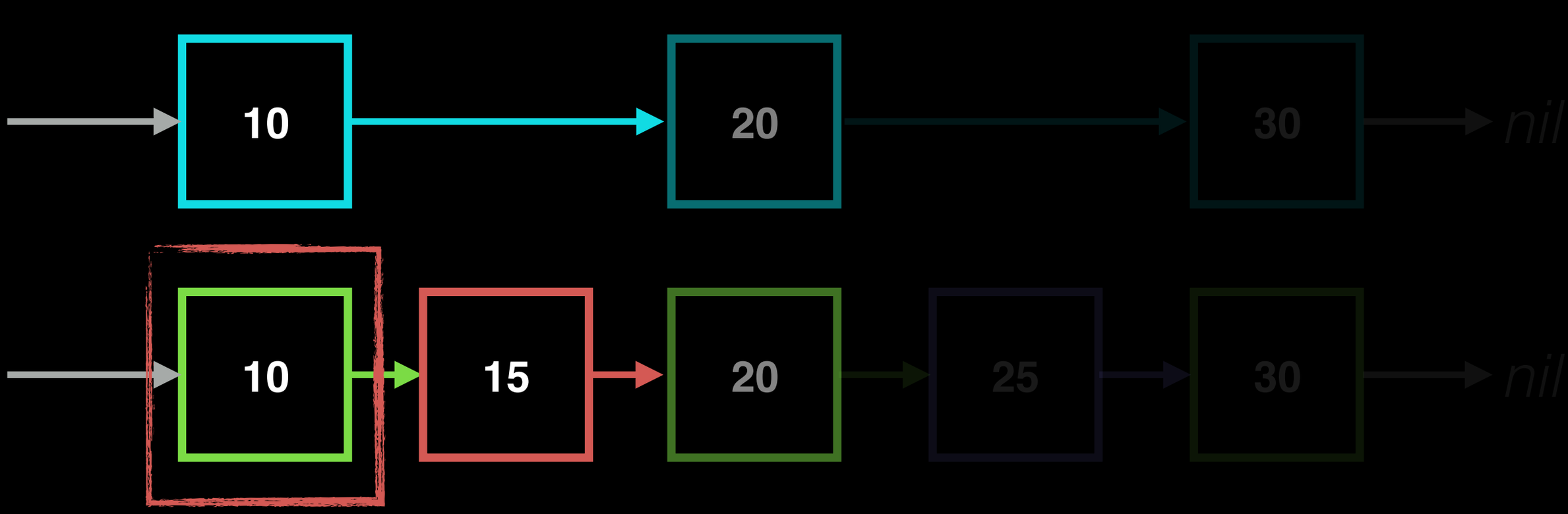
Concurrency

Concurrent Modifications



Concurrency

Concurrent Modifications



Concurrency

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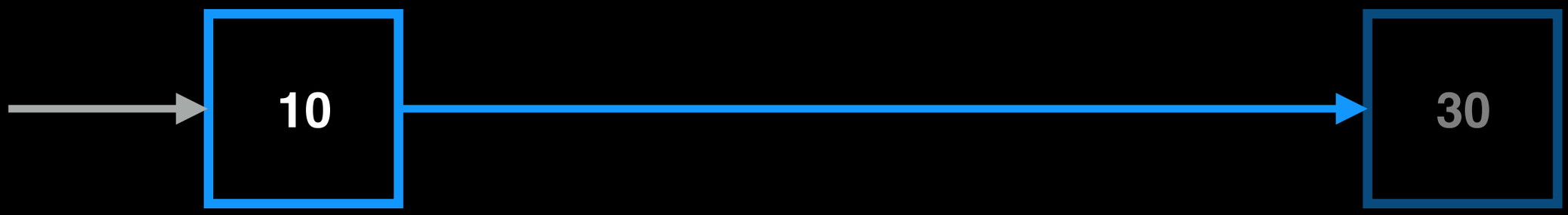
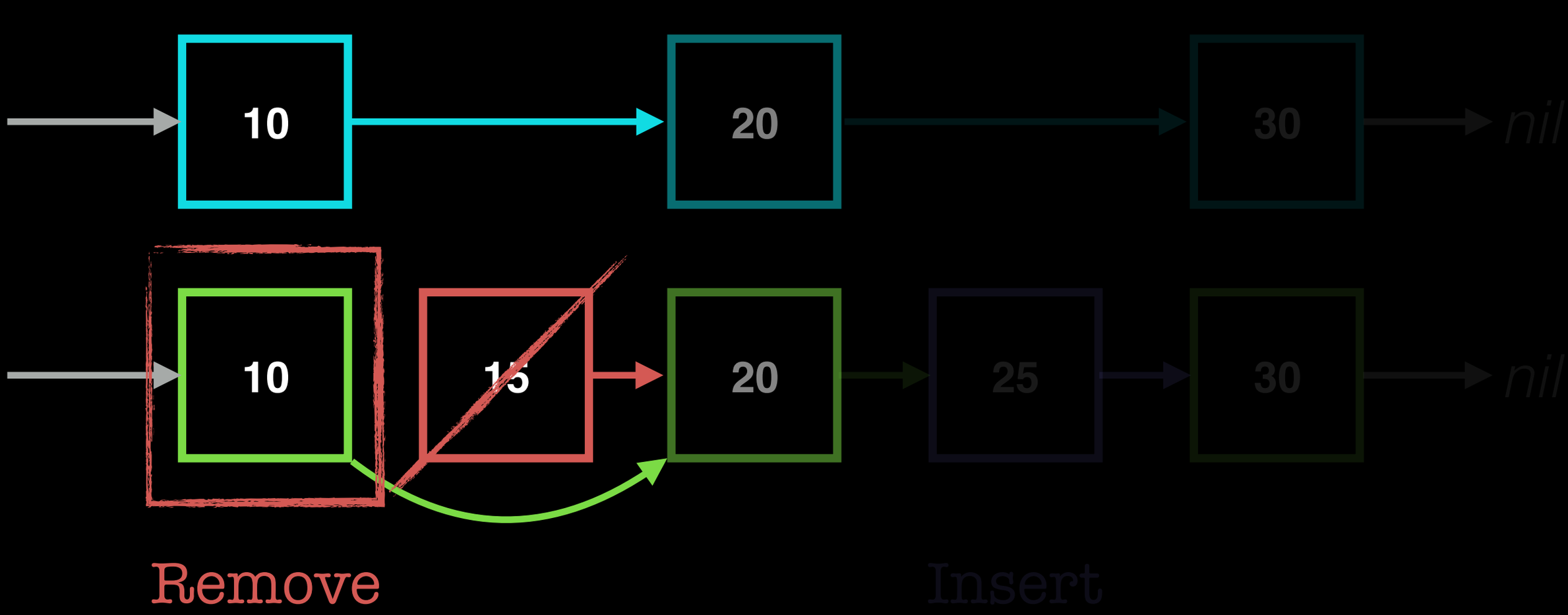
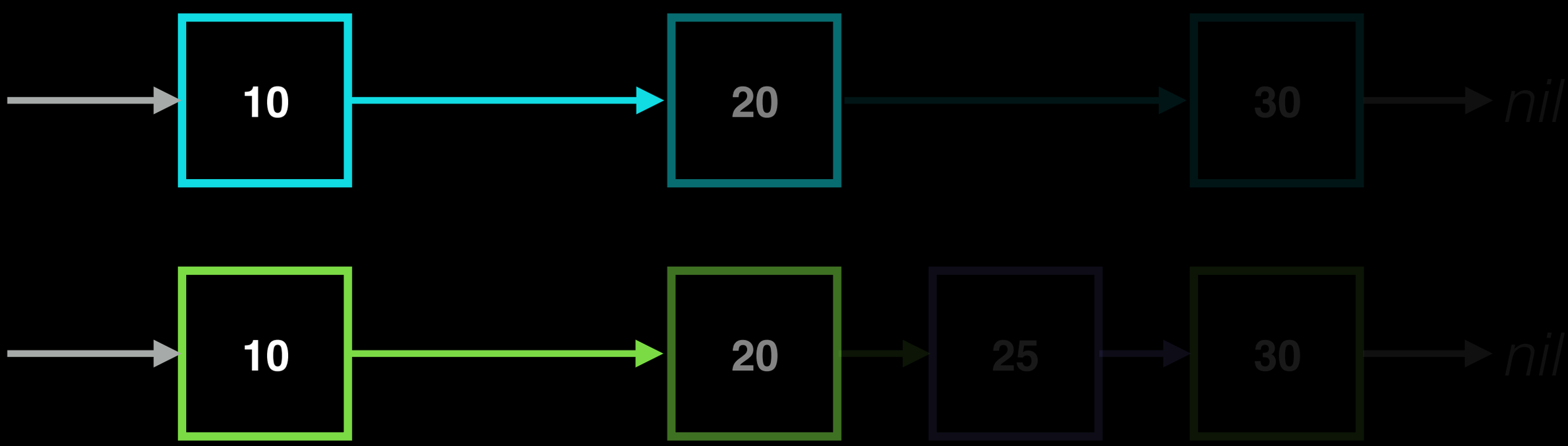




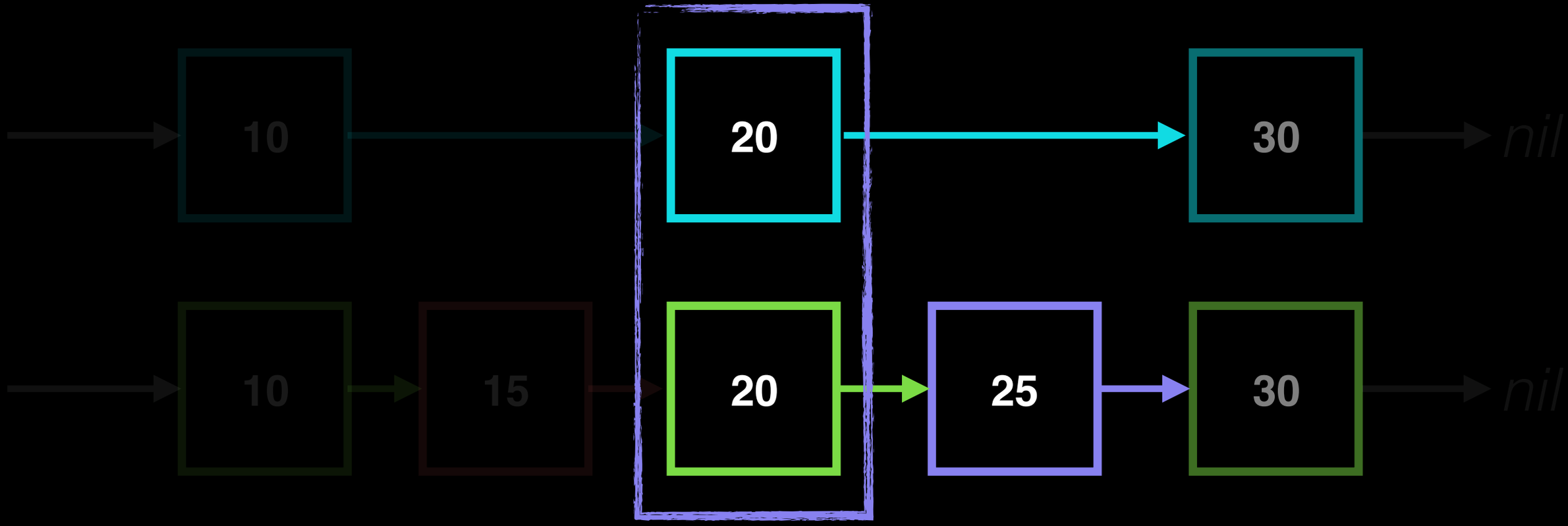
Concurrency

Concurrent Modifications



Concurrency

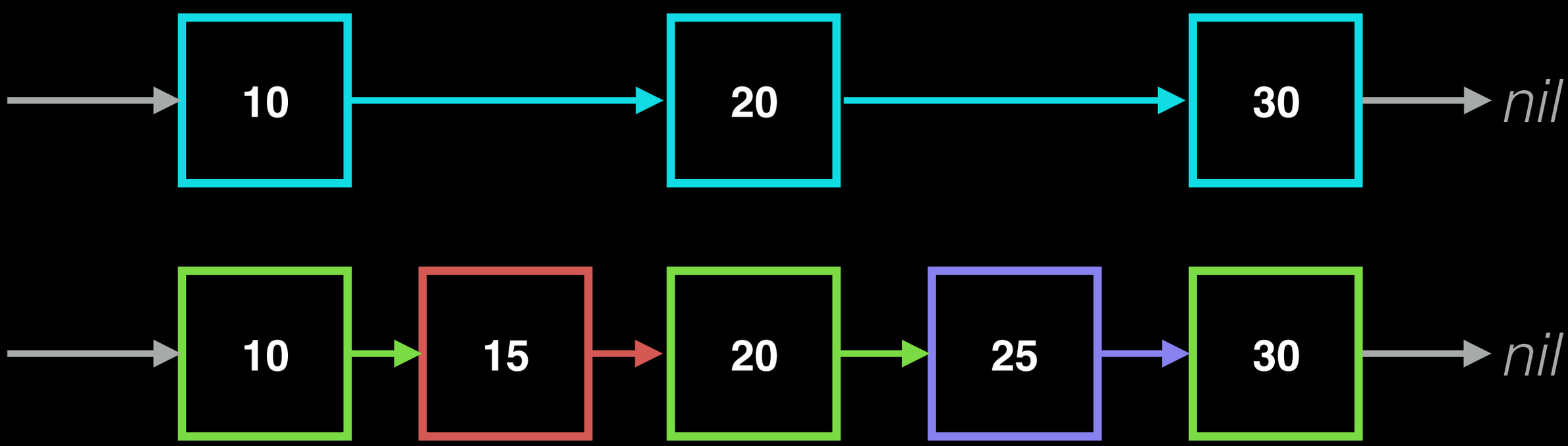
Concurrent Modifications



Insert

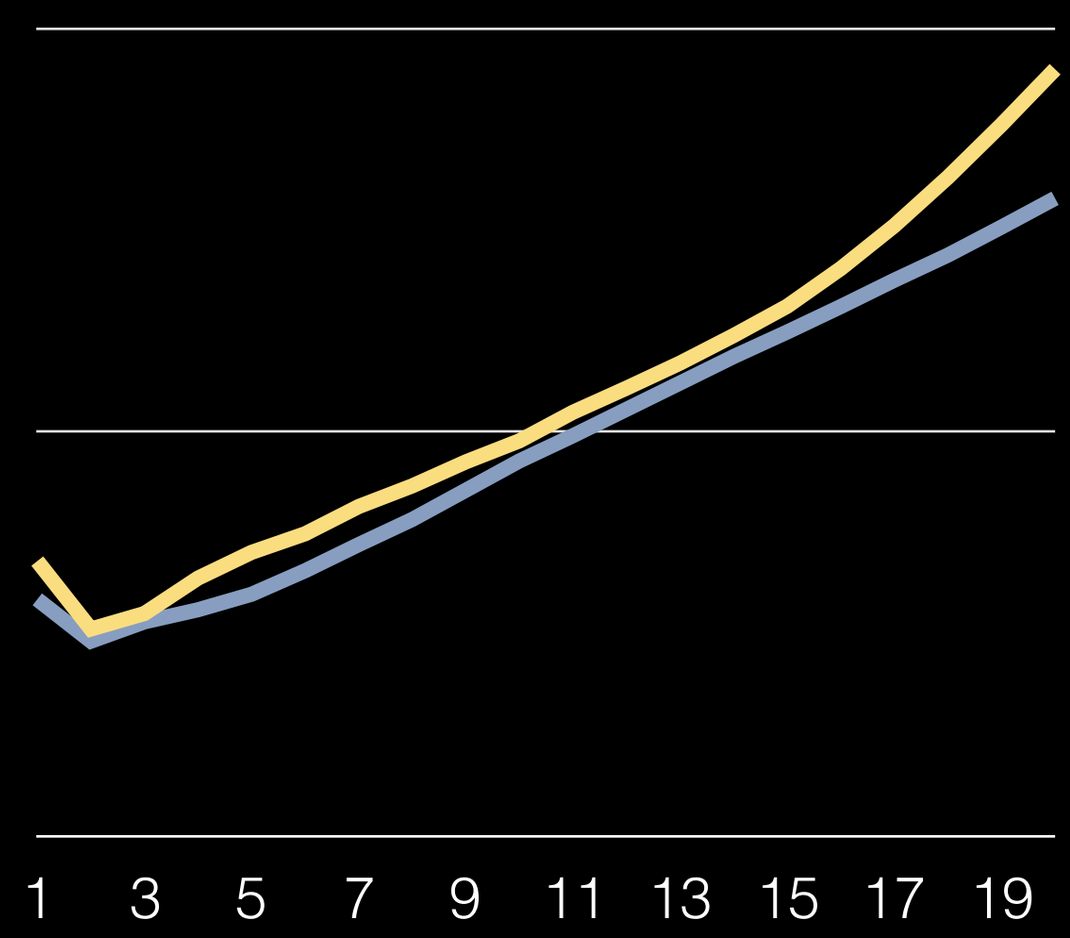
Concurrency

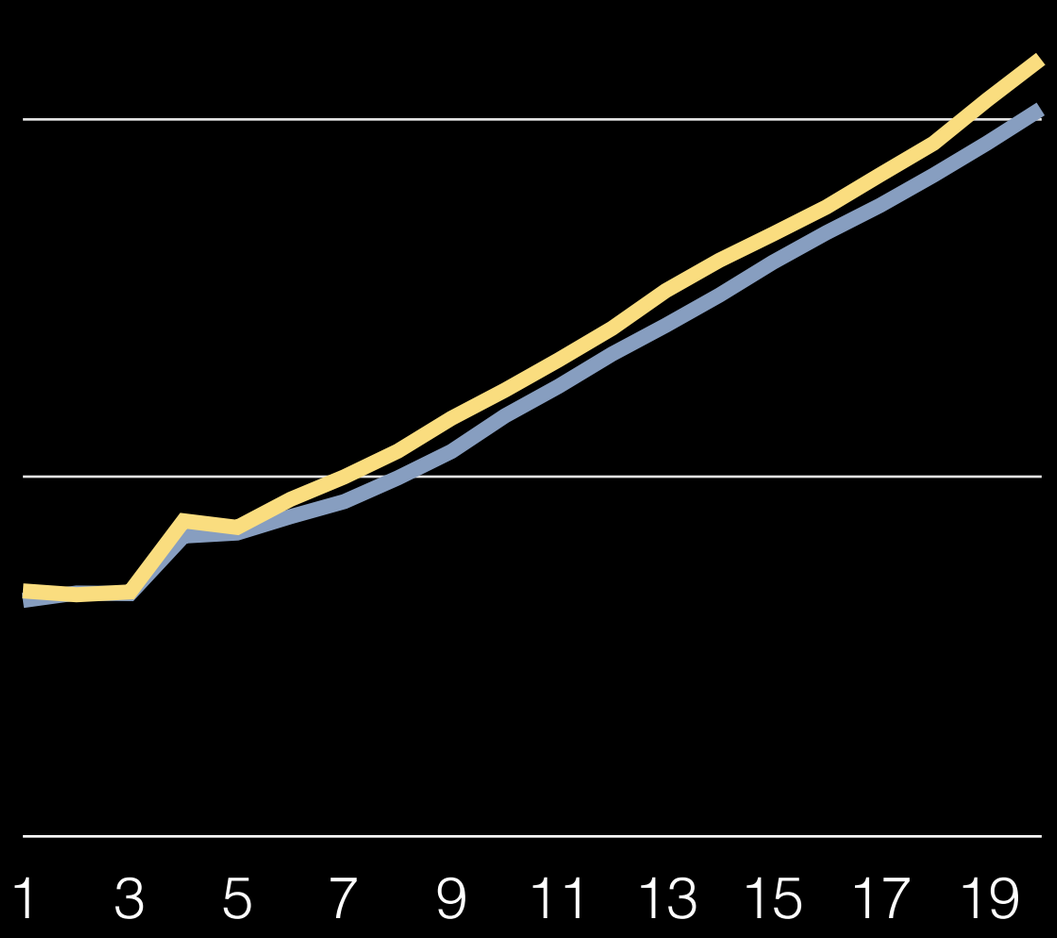
Concurrent Modifications



Insert Performance

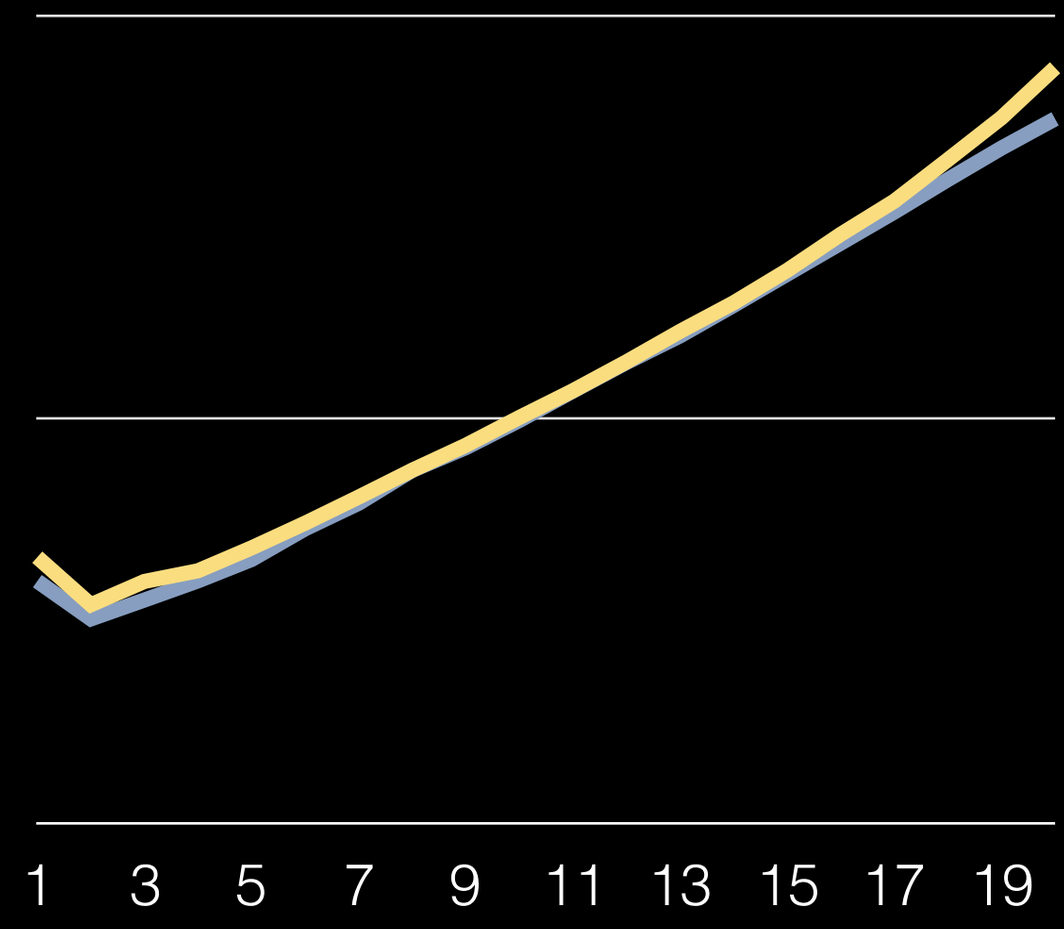
Θ(Log(n))

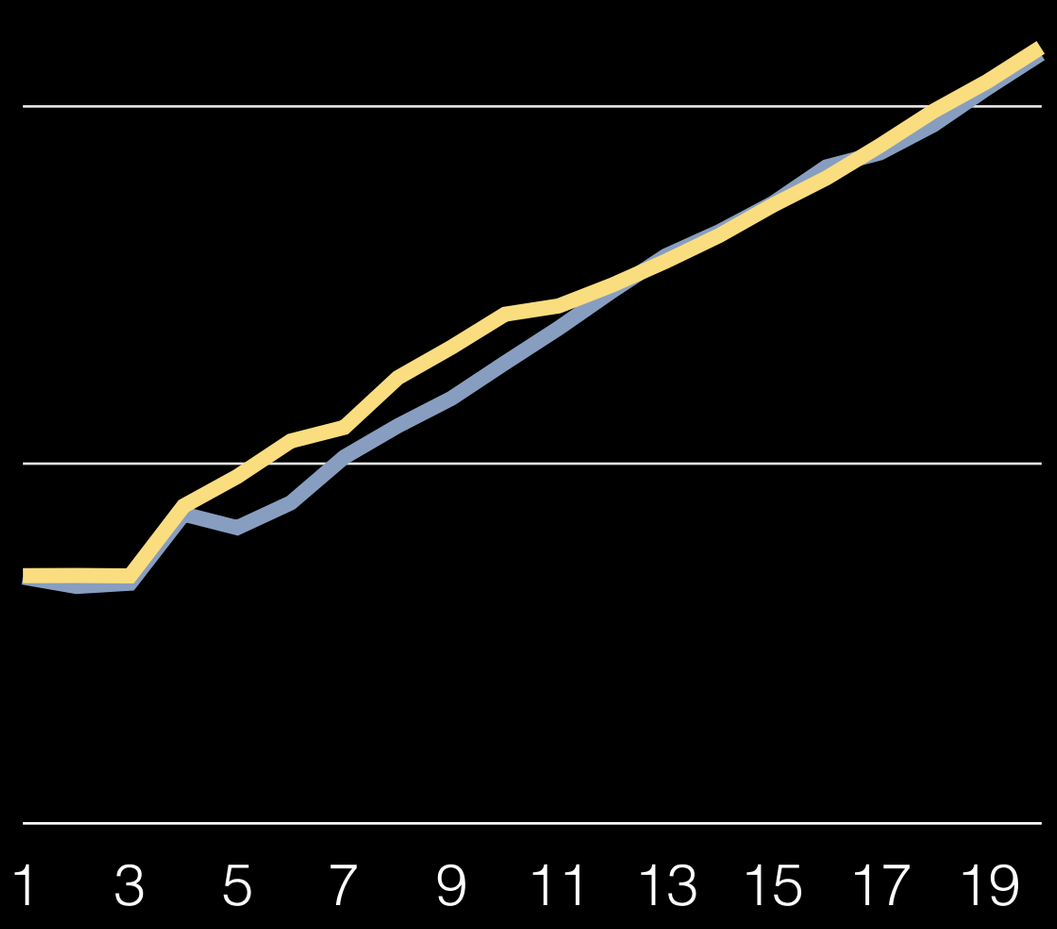




Remove Performance

Θ(Log(n))





Search Performance

Θ(Log(n))