COMP108
Data Structures and Algorithms

Bubble Sort Algorithm (Part II)

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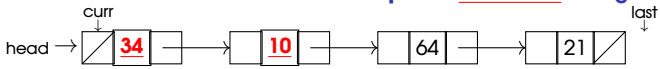
2022-23

Bubble sort with linked list - Example

underlined: being considered *italic*: sorted



curr

curr.next

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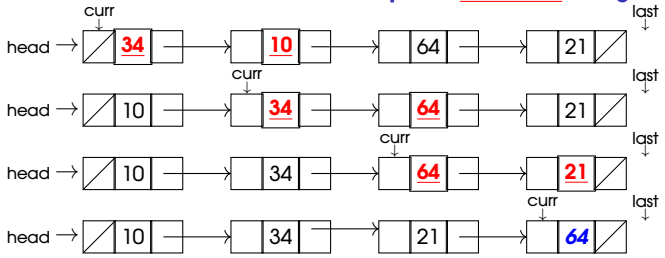

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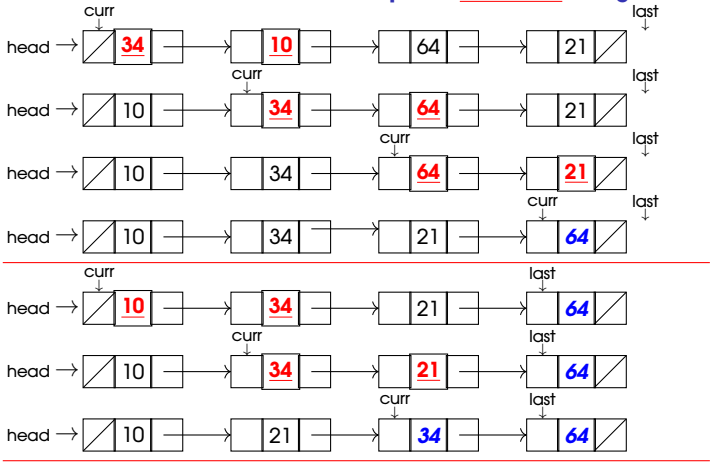

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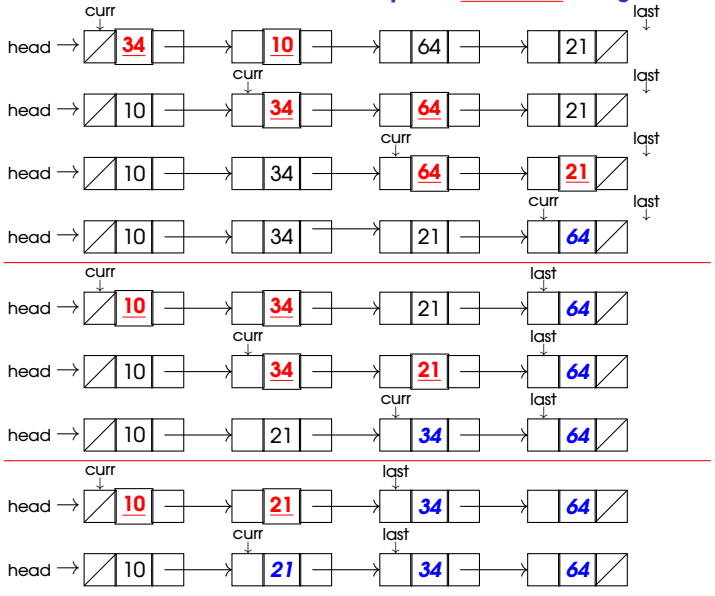

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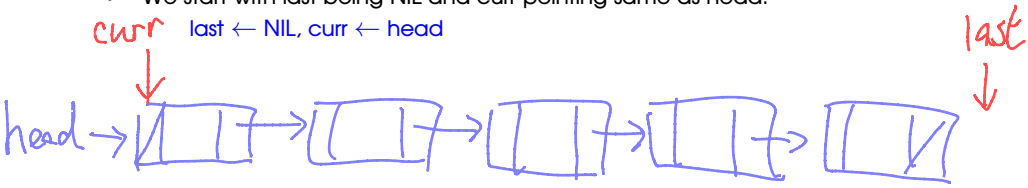

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  - Then we move curr along the linked list till the node before last

    while curr.next ≠ last do

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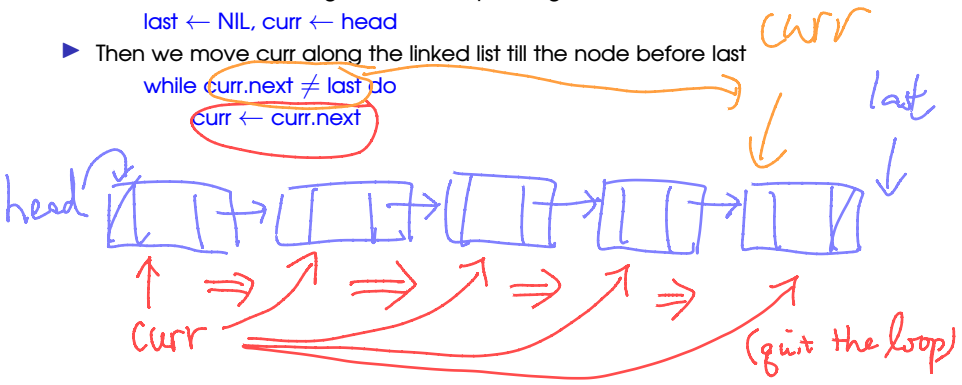

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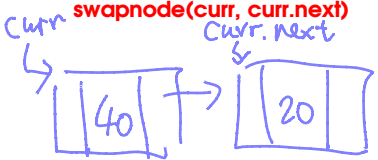
    while curr.next ≠ last do

    curr ← curr.next
  - In the loop, we swap two neighbouring nodes if they are in wrong order

    if curr.data > curr.next.data then

    swapnode(curr, curr.next)



swap curr.data &
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- After each round, last should point one node to the left & curr back to head

  last ← curr & curr ← head

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- Consider the first round.
  - We start with last being NIL and curr pointing same as head.

    last $\leftarrow$ NIL, curr $\leftarrow$ head
  - Then we move curr along the linked list till the node before last

    while curr.next $\neq$ last do

    curr $\leftarrow$ curr.next
  - In the loop, we swap two neighbouring nodes if they are in wrong order

    if curr.data > curr.next.data then

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- After each round, last should point one node to the left & curr back to head

  last $\leftarrow$ curr & curr $\leftarrow$ head

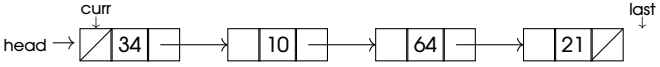
- Then repeat until one node left, i.e., outer loop should be

  while curr.next $\neq$ last do

Bubble sort with linked list - putting things together

if head == NIL then

Empty list and STOP!



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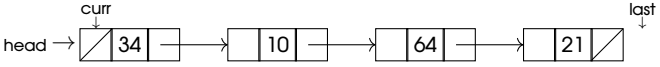

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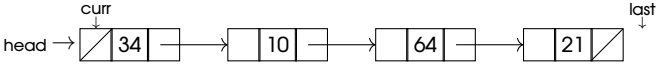

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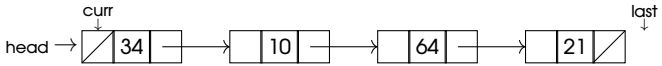

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swapnode(a, b)
    tmp ← a.data
    a.data ← b.data
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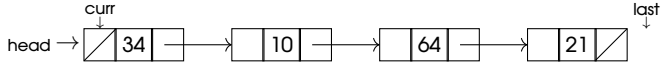

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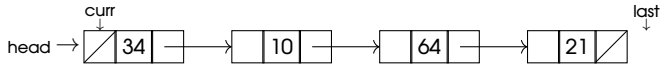

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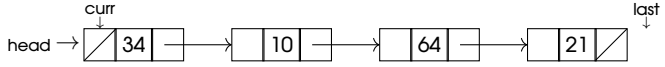

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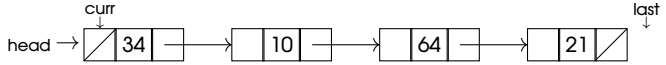
Time complexity?



Summary: Bubble Sort Algorithm with Linked List

Next: Selection Sort and Insertion Sort Algorithms

For note taking