Linked Nodes w/ Loops

Hitesh Boinpally
Summer 2023

Agenda

- Linked Nodes review
- Traversing `ListNode` sequences
- Modifying `ListNode` sequences
- Reminders

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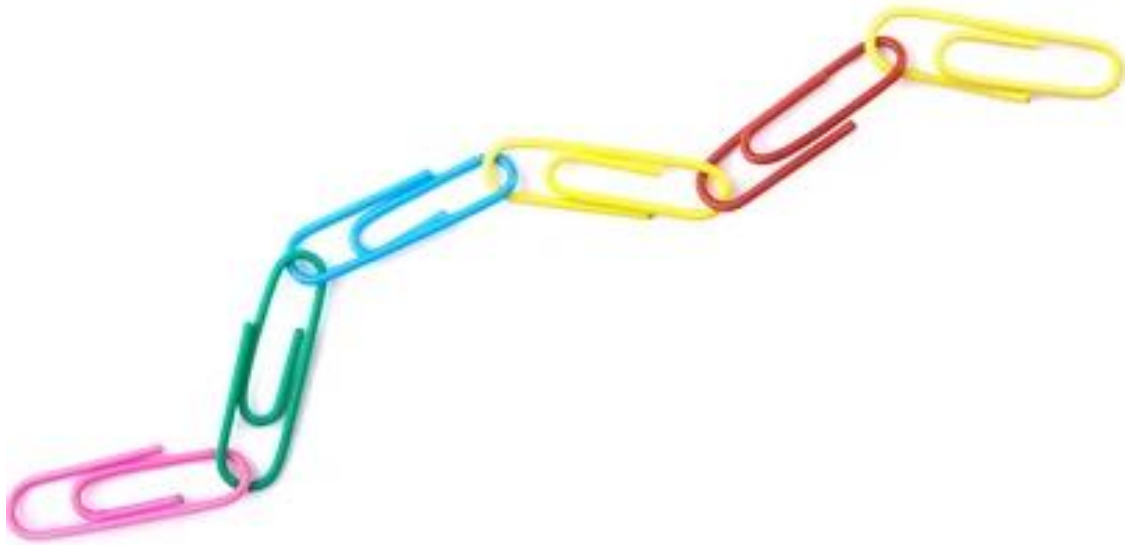
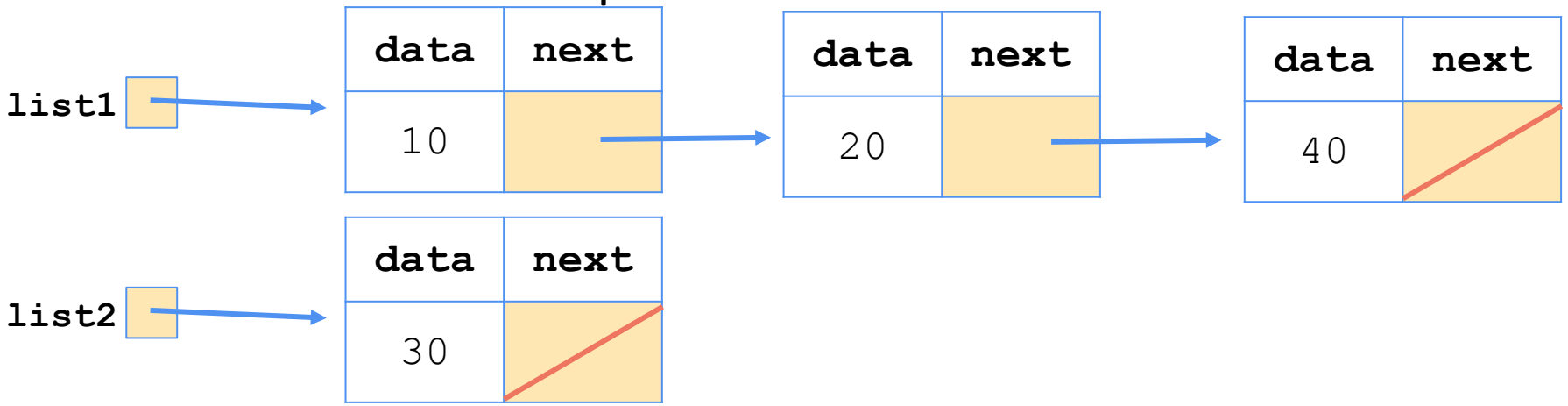
Linked Nodes Review

- New data structure to represent non-contiguous memory
- “Building blocks” for Linked Lists
  - “Legos”
- Today: arbitrary length sequences

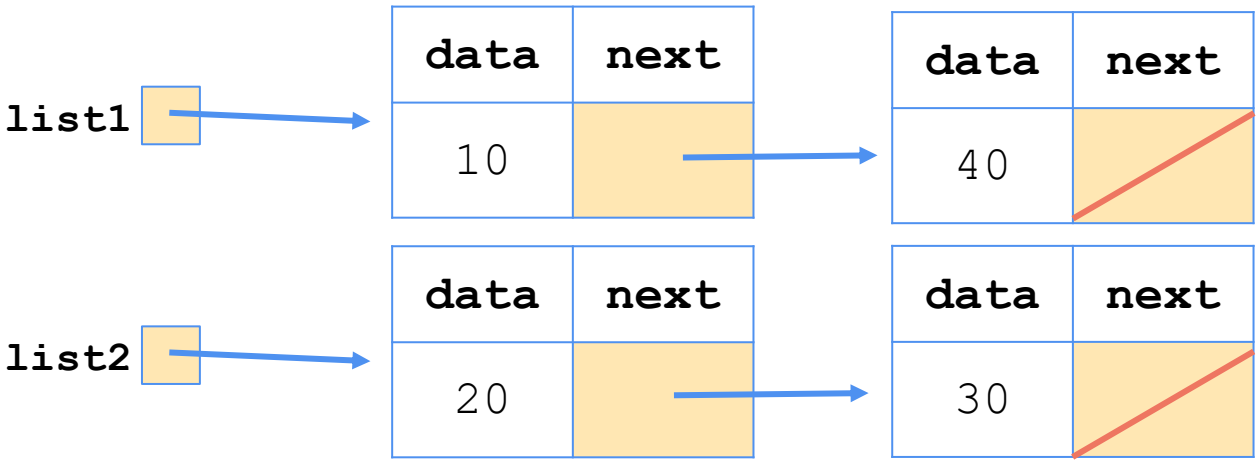


Problems so far

- What statements turn this picture:



- Into this picture?



(1 Possible) Answer:

```
ListNode temp = list1.next;
list1.next = list1.next.next;
temp.next = list2;
list2 = temp;
```

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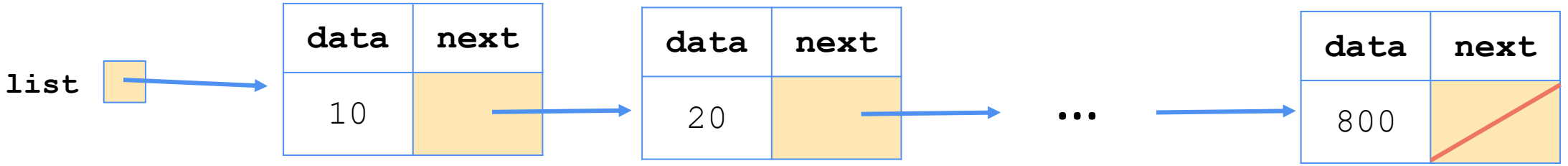
Printing a Sequence



- Suppose we have a sequence of nodes like the above
  - With unknown number of elements

- How would we print all the values out?

Printing a Sequence

- Pseudocode:

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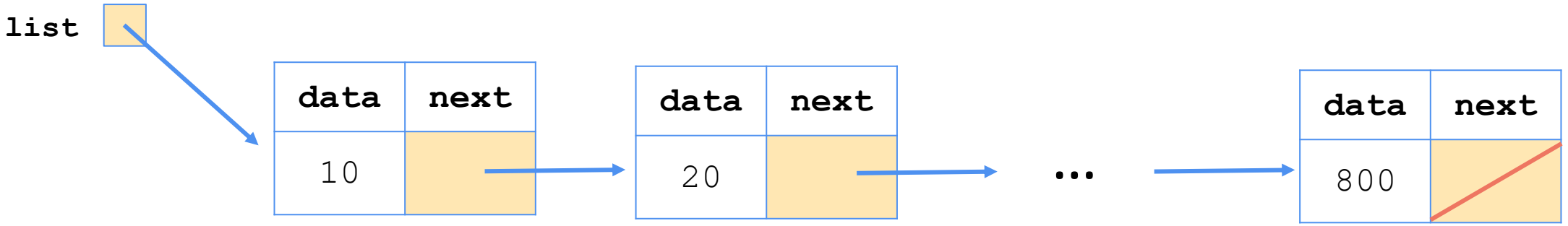
- How to go to the next node?
  - `list = list.next;`



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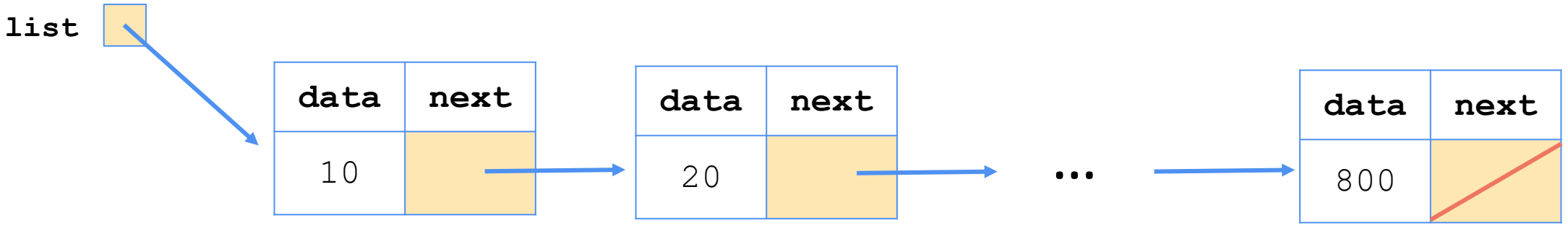

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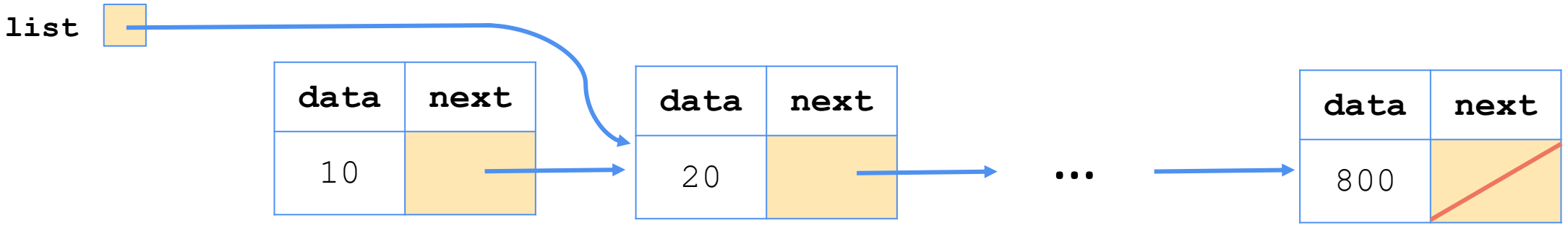

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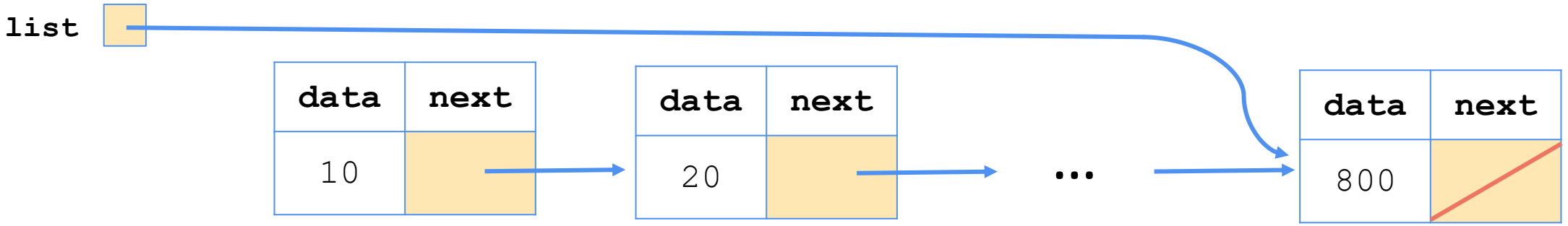

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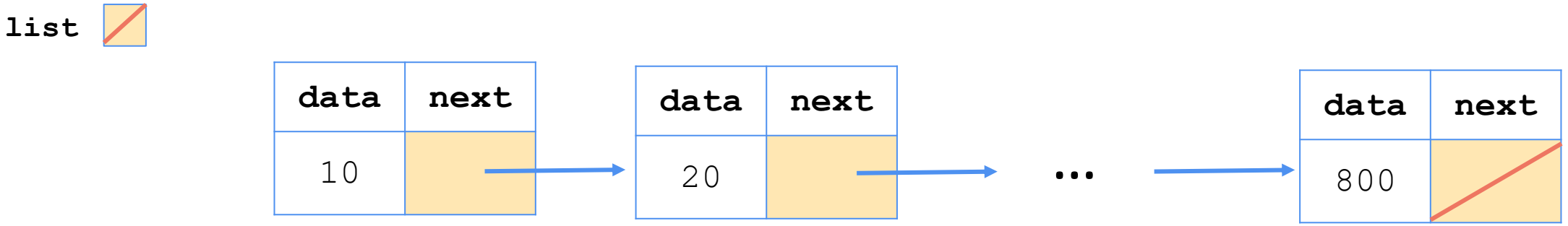

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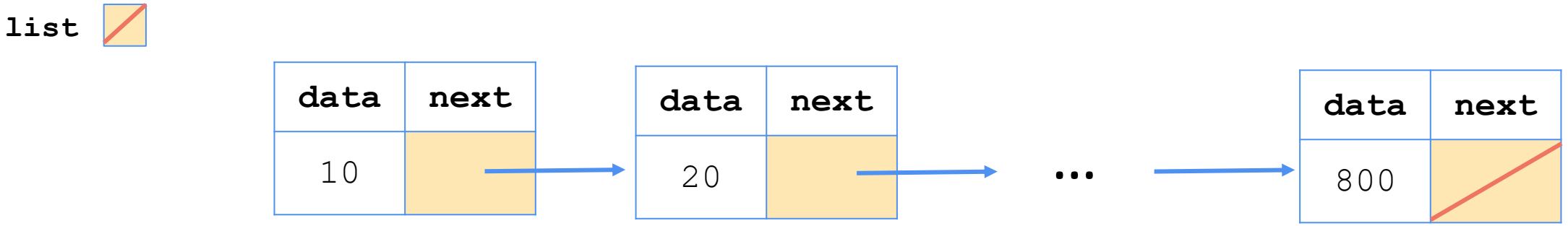
- How to go to the next node?
  - ~~`list = list.next;`~~ Destroys the list!



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- How to go to the next node?
  - Create a new variable and change it
  - `ListNode current = list`
  - `current = current.next`

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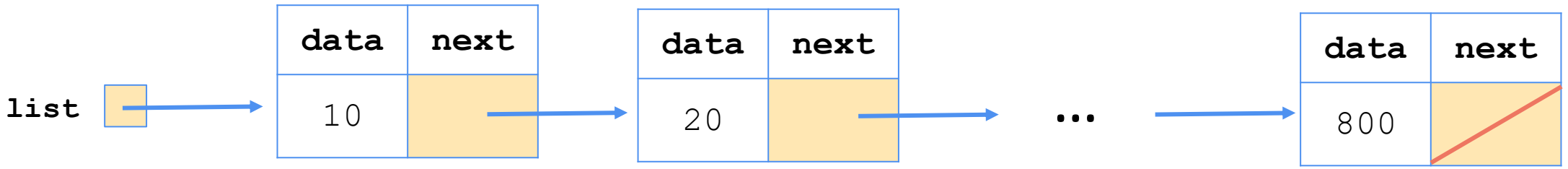

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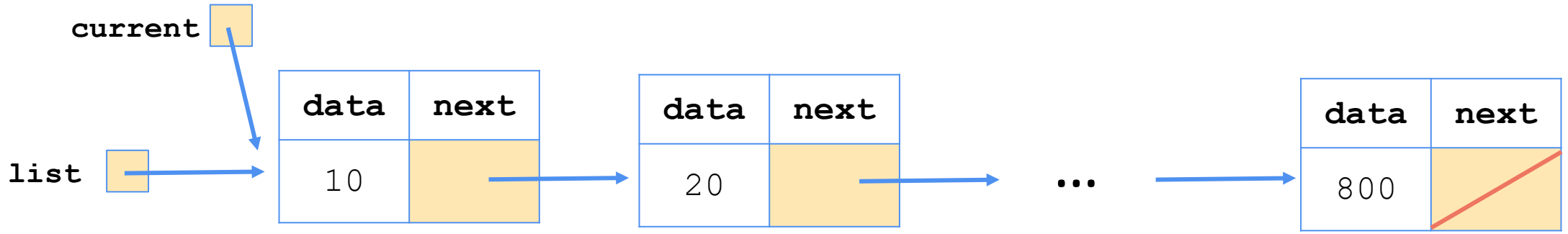

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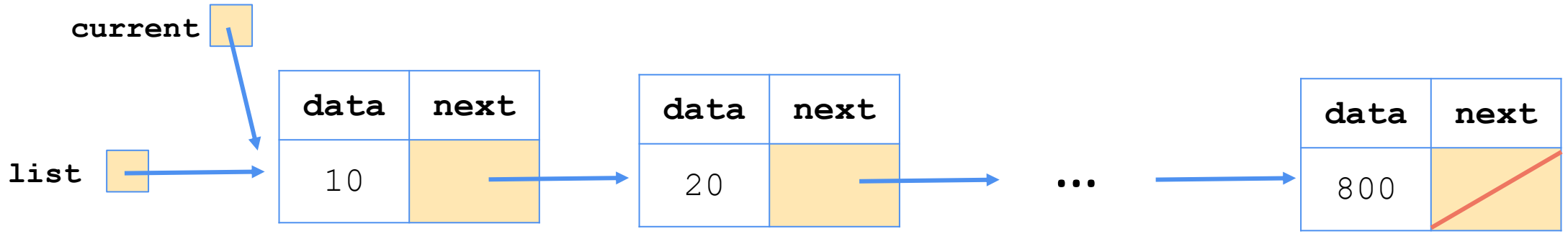

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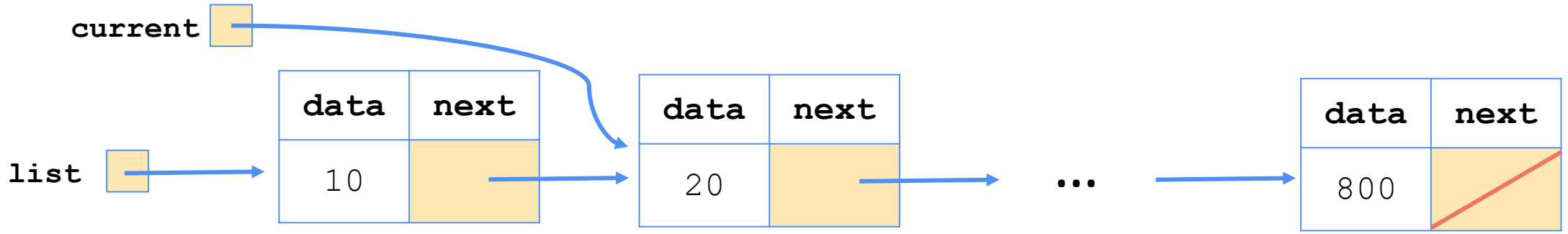

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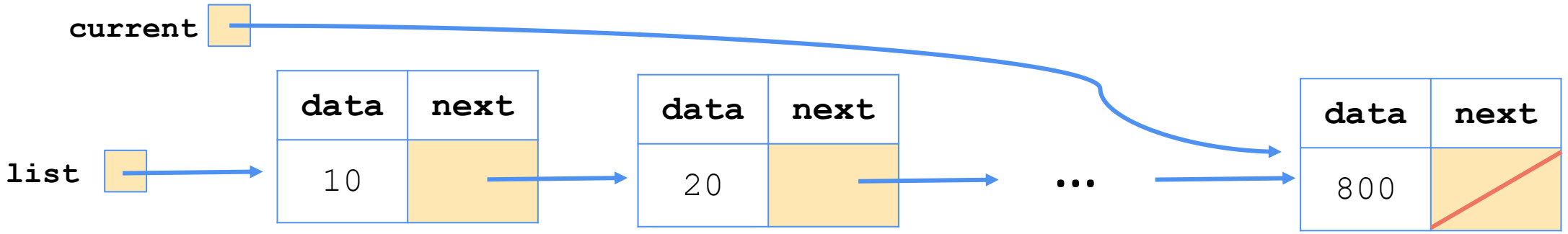

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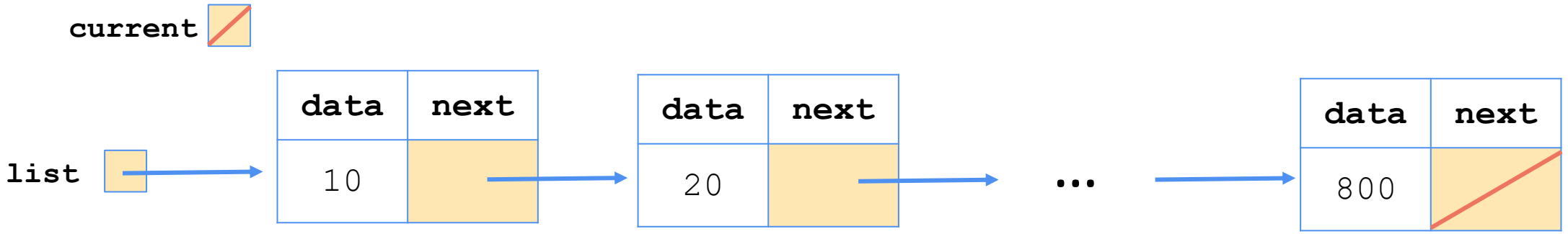

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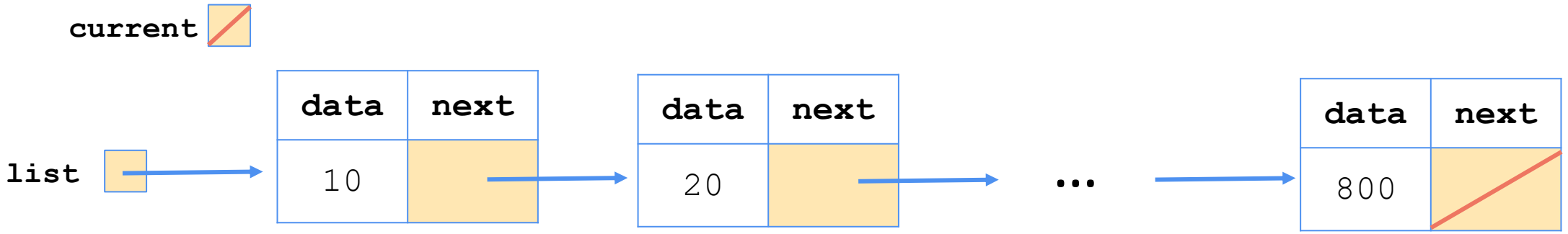
```

- How to go to the next node?
  - ~~`list = list.next;`~~ Destroys the list!
  - `ListNode current = list`
  - `current = current.next`

List is still intact!

Console:
10
20
…
800



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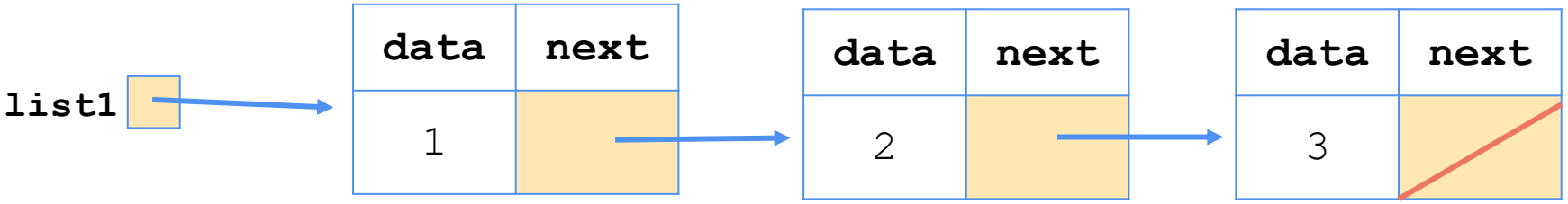
Adding to a Sequence

slido.com
code: #su_cse123

- Suppose we had the following sequence:



- What happens when we execute the below code?

```
ListNode current = list1;
while (current != null) {
    current = current.next;
}
current = new ListNode( data: 4);
```

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Reminders

- First resubmission form released tomorrow
  - Due next Friday
  - Can only resubmit assignments we have given feedback on!
- No section on Tuesday
  - We will still post materials
  - Optional like always