Lecture 5: ListNodes

07/01/22
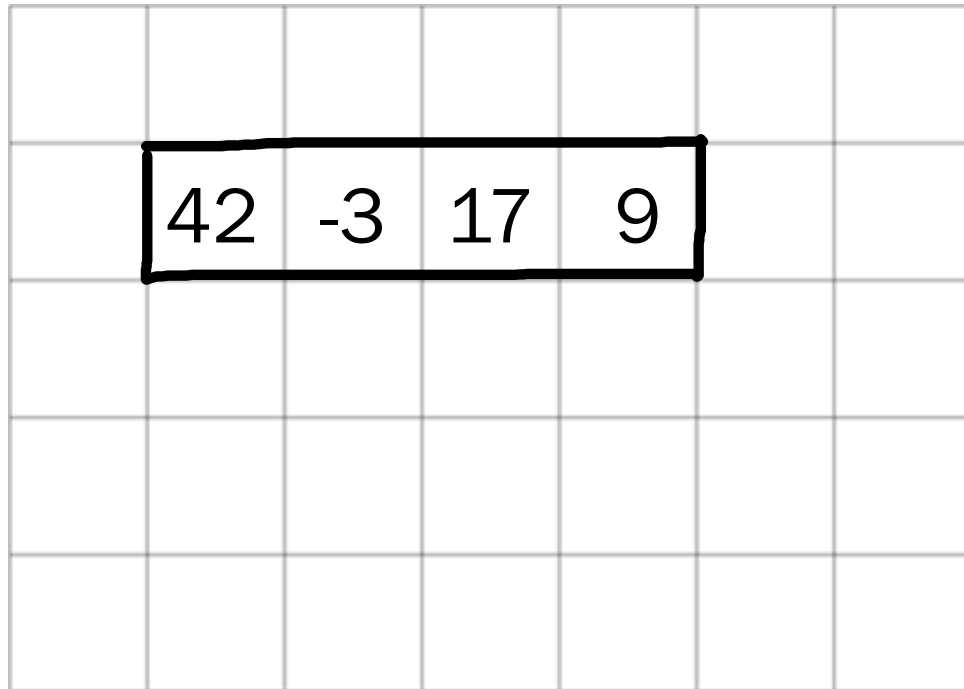
New Topic: Linked Lists!
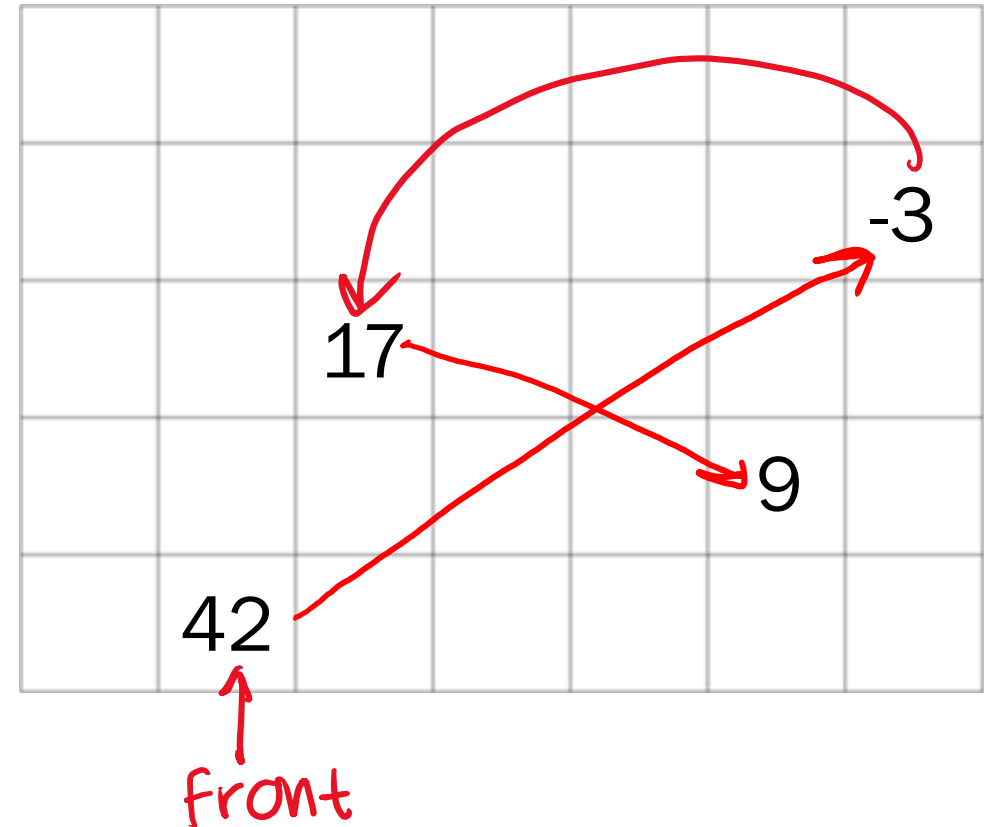
- Last week: clients of LinkedList<E>
  - `List<String> list = new LinkedList<>();`
  - `Queue<Integer> q = new LinkedList<>();`

- Today and next week: implementers of LinkedList
  - Today, Tuesday: `ListNodes`
  - Wednesday, Thursday, Friday: `LinkedIntList`
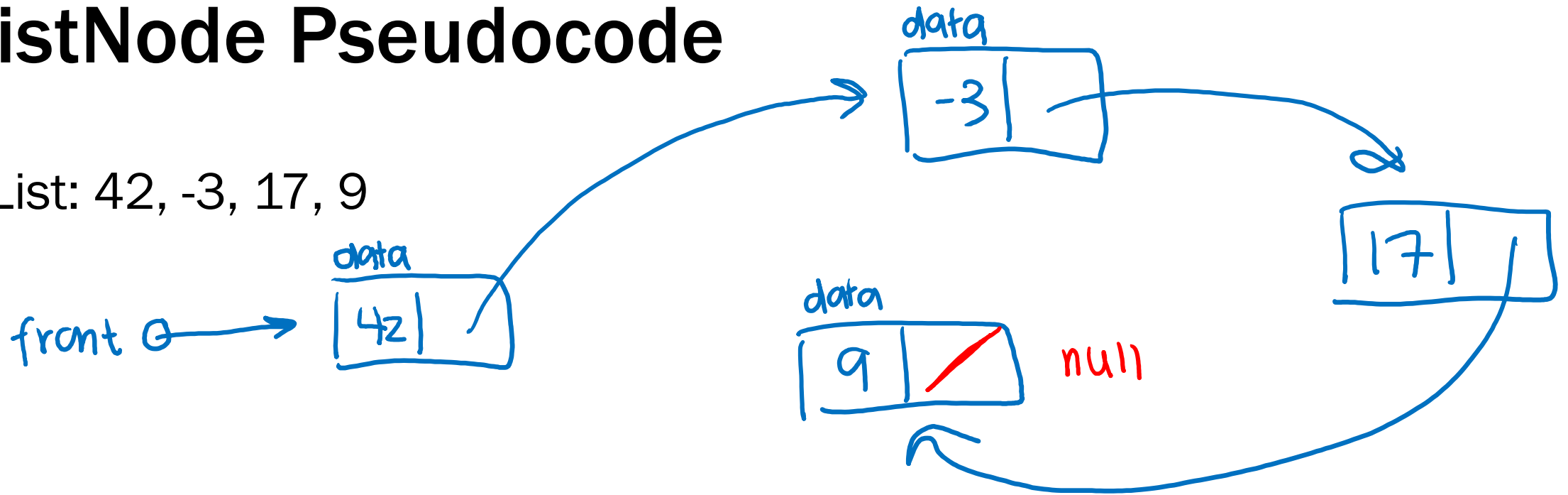
Memory for a list

- Contiguous in memory (array)

| 42 | -3 | 17 | 9 |

- Spread in memory

-3

17

9

42

front

ListNode Pseudocode

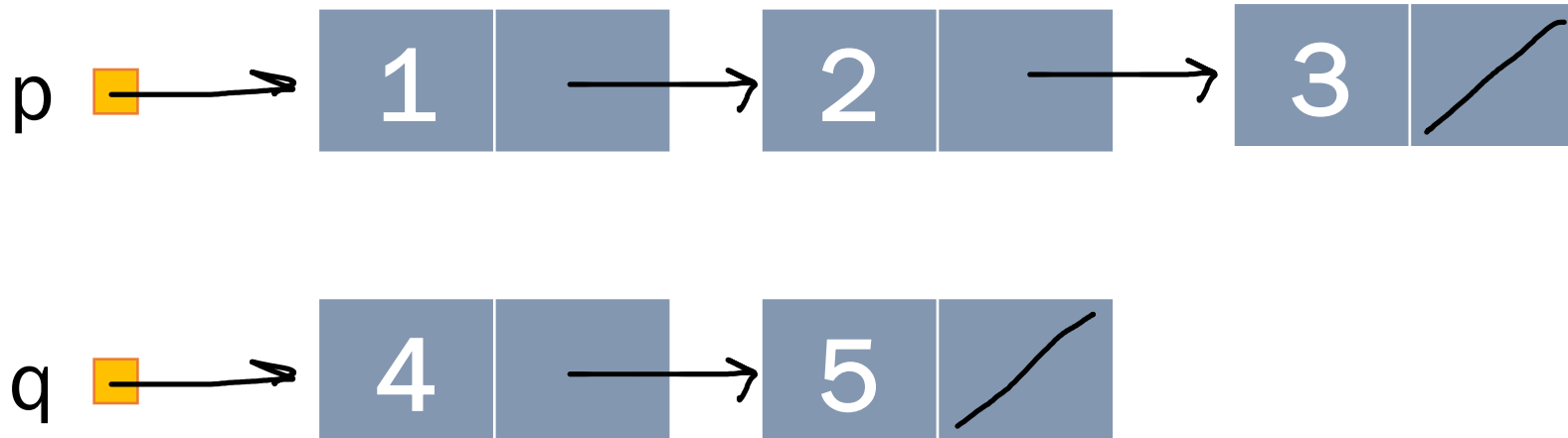- List: 42, -3, 17, 9

data

-3

data

42

front ○ →

data

9 | / null

17

ListNode

data (int)

next (ListNode)

- Suppose we had the following `ListNodes`:

- **What would the lists look like if we ran this line of code?**
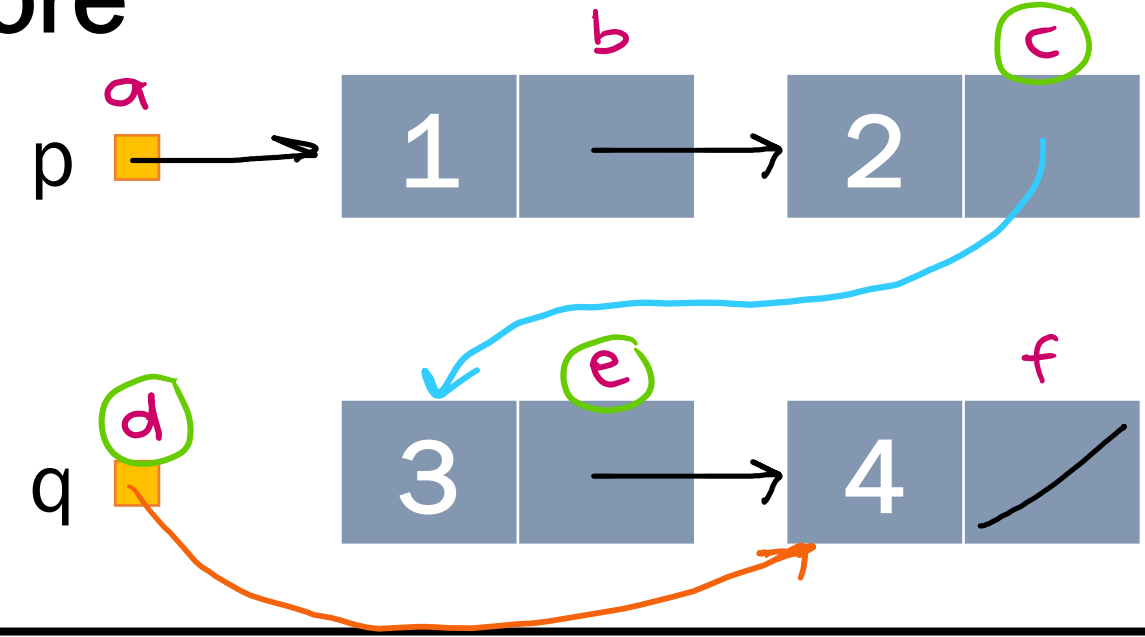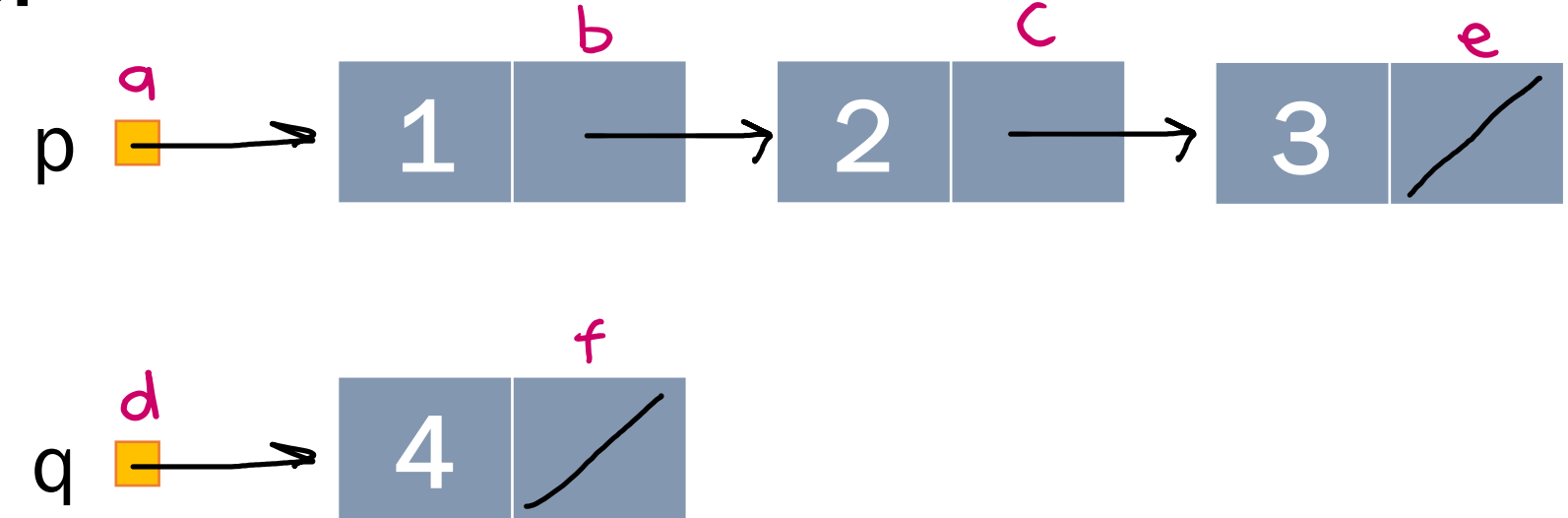
```
p.next = q.next;
```

Before

p → [1 | →] → [2 | /]

q → [3 | →] → [4 | /]

After

p → [1 | →] → [2 | →] → [3 | /]

q → [4 | /]

Before

p →[a] → | 1 | b → | 2 | c |

q →[d] → | 3 | e → | 4 | f |
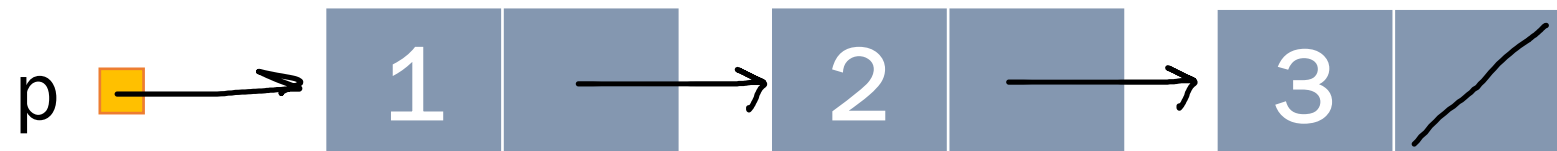
p.next.next = q;

q = q.next;

p.next.next.next = null;

After

p →[a] → | 1 | b → | 2 | c → | 3 | e |

q →[d] → | 4 | f |

Announcements

- Monday, July 4th – No Lecture, IPL closed

- Checkpoint 2 due Wednesday, July 6th @ 11:59pm
- A2: GuitarHero due Thursday, July 7th @ 11:59pm