Algorithms & Data Structures 1 Ass. 02

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1. Array vs. Single Linked List

Array

Step 0:

Array: [9, 2, 2, 2, 2, 1, 1, 1]
↑

Current element:
Current element index: 0
Comment: 9! = 4 next element

Step 1:

Array: [9, 2, 2, 2, 2, 1, 1, 1]
↑

Current element:
Current element index: 1
Comment 4 > 2 insertion point

The size of an array is fixed. So we basically replace the first number in the fitting index with the number 4.

Step 2:

Array: [9, 4, 2, 2, 2, 1, 1, 1]
↑

Current element:
Current element index: 1
Comment: insert 4

Thus,

[9, 4, 2, 2, 2, 1, 1, 1]

Step 0:

List: [1] -> [1] -> [1] -> [2] -> [2] -> [2] -> [2] -> [9] List

↑

Current element:

Comment: 1!=4 -> next element by following the pointer

Step 1:

List: [1] -> [1] -> [1] -> [2] -> [2] -> [2] -> [2] -> [9]

↑

Current element:

Comment: 1!=4 -> next element by following the pointer

Step 2:

List: [1] -> [1] -> [1] -> [2] -> [2] -> [2] -> [2] -> [9]

↑

Current element:

Comment: 1!=4 -> next element by following the pointer

Step 3:

List: [1] -> [1] -> [1] -> [2] -> [2] -> [2] -> [2] -> [9]

↑

Current element:

Comment: 2!=4 -> next element by following the pointer

Step 4:

List: [1] -> [1] -> [1] -> [2] -> [2] -> [2] -> [2] -> [9]

↑

Current element:

Comment: 2!=4 -> next element by following the pointer

Step 5:

List: [1] → [1] → [1] → [2] → [2] → [2] → [2] → [9]

Current element:

Comment: 2 != 4 → next element by following the pointer

Step 6:

List: [1] → [1] → [1] → [2] → [2] → [2] → [2] → [9]

Current elemend:

Commend: 2 != 4 → next element by following the pointer

Step 7:

List: [1] → [1] → [1] → [2] → [2] → [2] → [2] → [9]

Current element:

Comment: 9 > 4, since the node [9] > 4, we create a new node [4]

Step 8:

List: [1] → [1] → [1] → [2] → [2] → [2] → [2] → [9]

New node: [4]

Step 9:

List: [1] → [1] → [1] → [2] → [2] → [2] → [2] → [4] → [9]

Current element: We inserted the new node, so that the pointer of [2] points to [4] and the pointer of [4] points to [9].