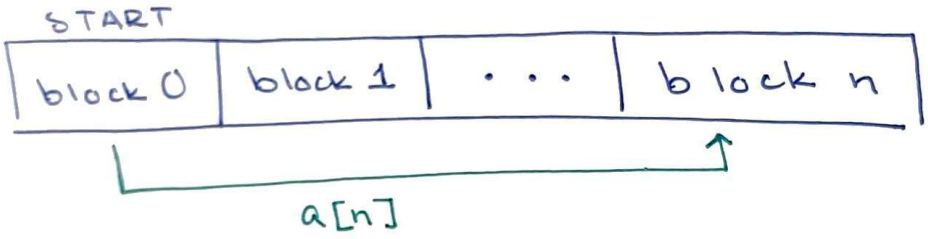
(1)

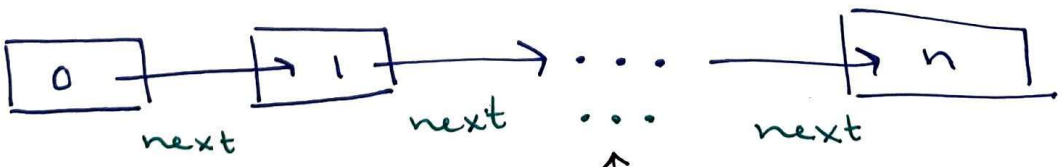
An array consists of fixed, pre-allocated, contiguous memory when an array is created, the variable we assign the array to essentially gives us the "start" of an array, and an index tells us how far offset from the start we should look. It is just a matter of adding that index to the address of the array head.



address of a[0] + n blocks

↖ the only necessary operation here; constant

A linked list consists of dynamic, distributed memory. If we want to find an element, we don't have its address saved and can't easily calculate it. We must follow the "trail" from the start to the final value we want.

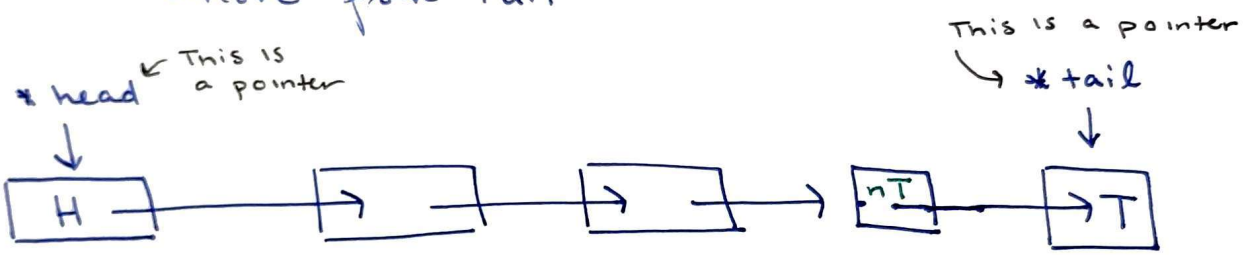


↖ The # of ops here depends on how large the list is.

(2) A singly linked list does not implement a deque. A deque has essentially 4 operations that should run in constant time (regardless of how long a find(x) operation takes):

- add to head
- remove from head
- add to tail
- remove from tail

} there are fine



Removing T is fine ~~once we find it~~ because of the tail ptr, but we have to move *tail to nT. We have to traverse the list to find this node's address; there is no short cut backwards.

(3) Any of the following:

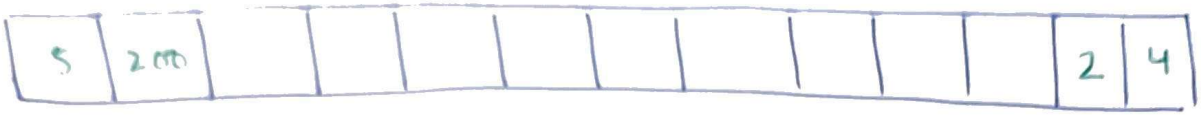
★ - You want to handle sequential data and preserve sequence

- You want to use a simple data structure and don't care about trying to go "backwards"
- You want to remove from the middle while using an array — this is slightly easier for array-based queue as we implement it
- You want to model some system that you describe in your answer

→ Essentially all possible answers are more specific cases of this general case.

(4)


5
200
2
8
4
i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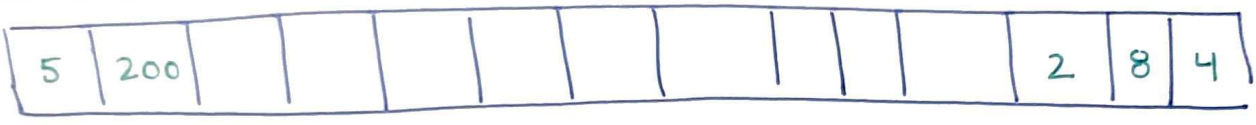
OR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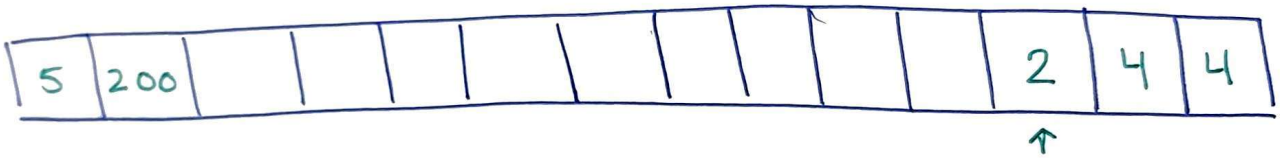
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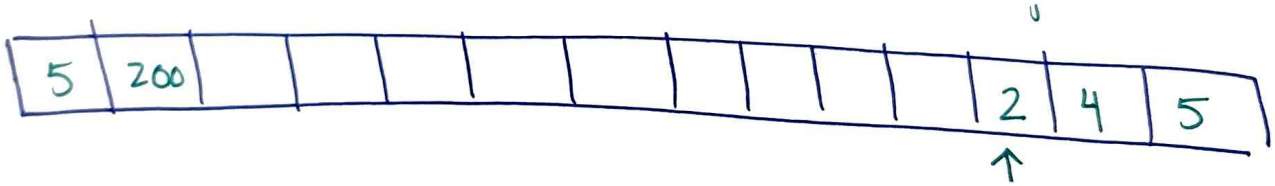
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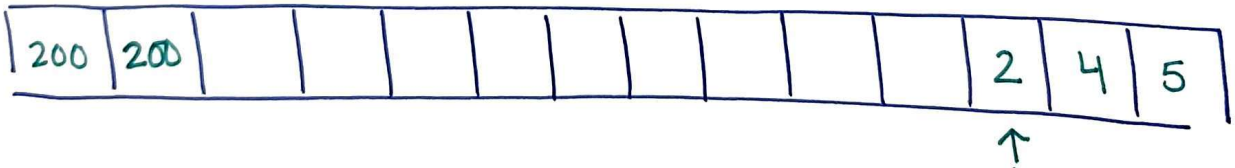
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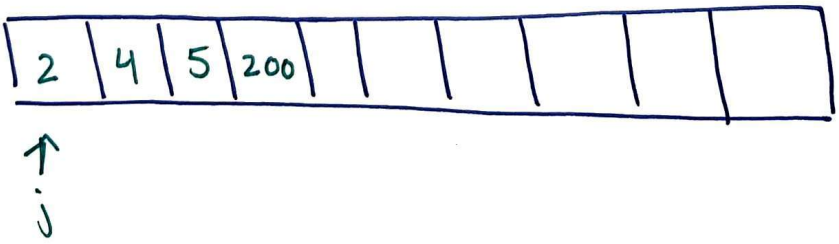
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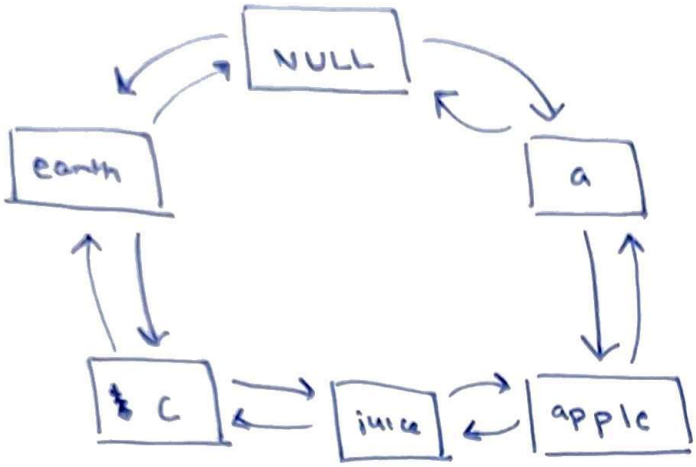
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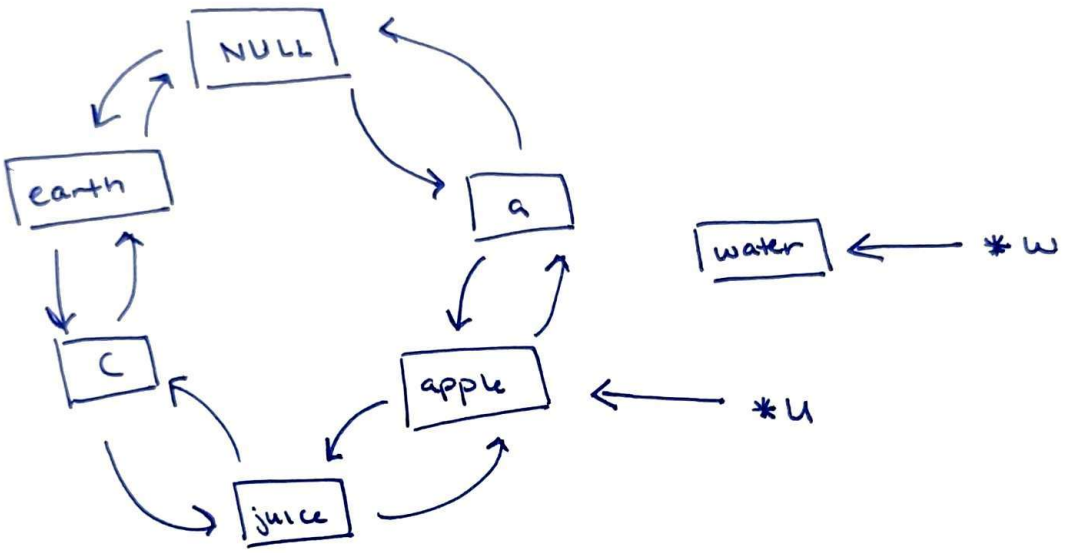
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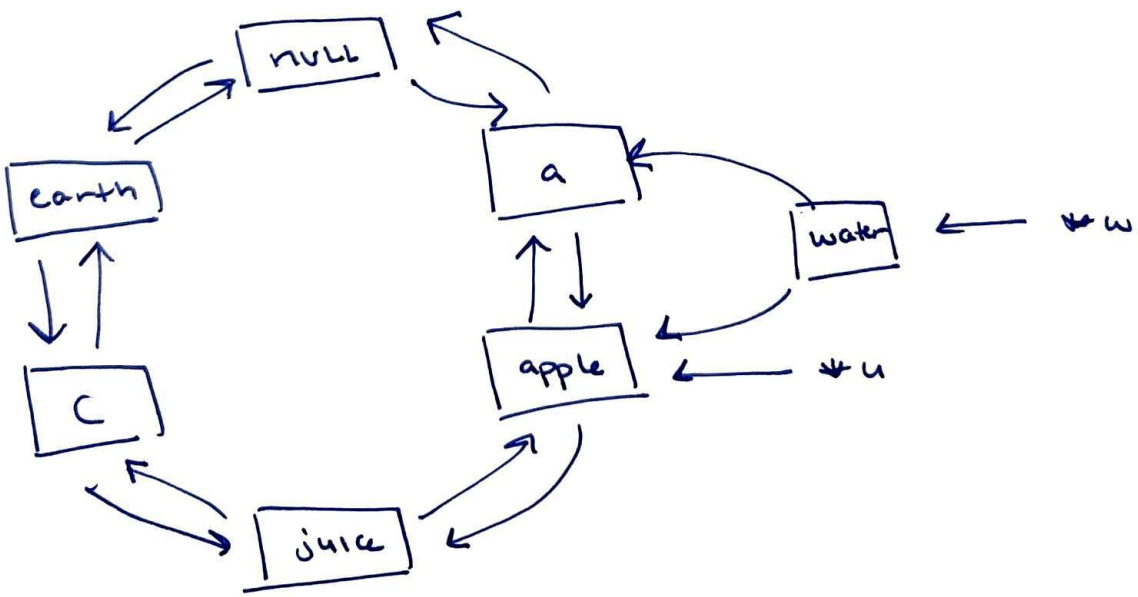
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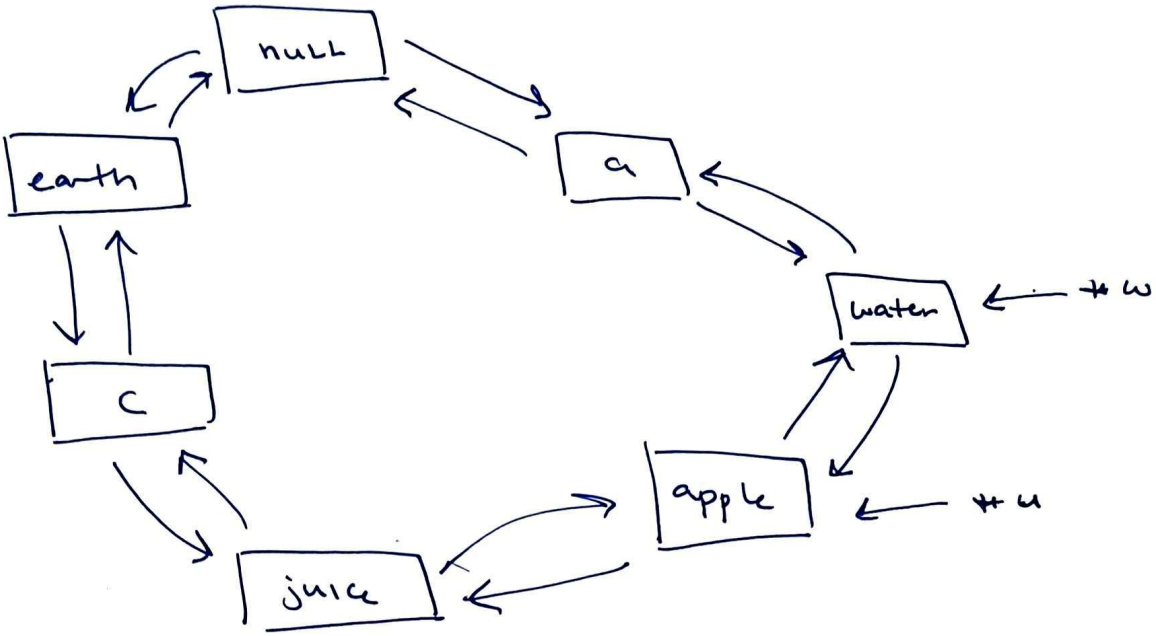
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