

Linked List vs Array

Difficulty Level: Rookie

Both Arrays and [Linked List](#) can be used to store linear data of similar types, but they both have some advantages and disadvantages over each other.

Following are the points in favour of Linked Lists.

(1) The size of the arrays is fixed: So we must know the upper limit on the number of elements in advance. Also, generally, the allocated memory is equal to the upper limit irrespective of the usage, and in practical uses, upper limit is rarely reached.

(2) Inserting a new element in an array of elements is expensive, because room has to be created for the new elements and to create room existing elements have to shifted.

For example, suppose we maintain a sorted list of IDs in an array `id[]`.

`id[] = [1000, 1010, 1050, 2000, 2040,]`.

And if we want to insert a new ID 1005, then to maintain the sorted order, we have to move all the elements after 1000 (excluding 1000).

Deletion is also expensive with arrays until unless some special techniques are used. For example, to delete 1010 in `id[]`, everything after 1010 has to be moved.

So Linked list provides following two advantages over arrays

- 1) Dynamic size
- 2) Ease of insertion/deletion

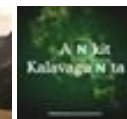
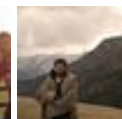
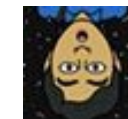
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Linked lists have following drawbacks:

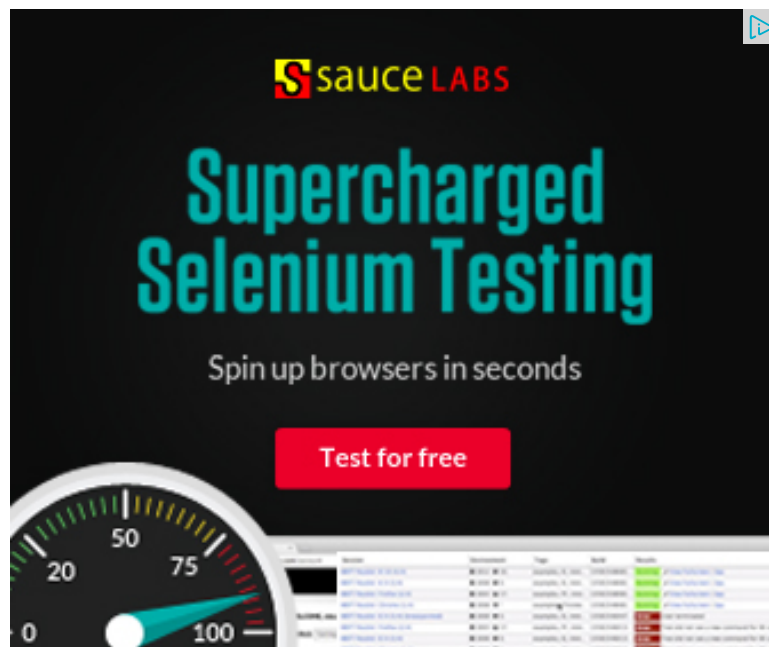
- 1) Random access is not allowed. We have to access elements sequentially starting from the first node. So we cannot do binary search with linked lists.
- 2) Extra memory space for a pointer is required with each element of the list.
- 3) Arrays have better cache locality that can make a pretty big difference in performance.

Please also see [this](#) thread.

References:

<http://cslibrary.stanford.edu/103/LinkedListBasics.pdf>

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above.



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11



2



1

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nohappy singh • 3 months ago

Arrays have better cache locality that can make a pretty big difference in perfo

^ | v •



kx → nohappy singh • 3 months ago

I think it means that arrays have better performance compared to linked list located in memory. Elements in a linked list might be scattered around memory, making it less efficient.

1 ^ | v •



Deepak Singh • 10 months ago

easy at all... :)

^ | v •



Kunal Pandey • a year ago

I like

^ | v •

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Rahul Sundar · 2 years ago

This is the only easy post of all...lol

```
/* Paste your code here (You may delete these lines if not writing c
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2 ^ | v ·



LoneShadow · 3 years ago

Arrays have better cache locality that can make a pretty big difference in perfo

^ | v ·



gaurav → LoneShadow · 8 months ago

can you please make this cache locality point clear.

2 ^ | v ·



Sandeep → LoneShadow · 3 years ago

Thanks for suggesting this point. We have added this to the original po

1 ^ | v ·



Venki · 3 years ago

The line "Inserting a new element in an array of elements is expensive" is misl sentence.

Array is preferred when random access is more frequent than sorted insertion

^ | v ·



Sandeep → Venki · 3 years ago

705



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For example, given a big filled array and we want to inset a new element, we move all filled elements after 5th position.

^ | v .



ASHU → Sandeep · 3 years ago

@sandeep-----u r right.....

^ | v .



Ahmet Alp Balkan · 3 years ago

This wasn't a geeky post though.

^ | v .

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