

For Data Access Array is recommend ::
Time Complexity :
If we know the index number then its = $O(1)$
Otherwise Iteration is needed so $O(n)$

Space Complexity : $O(n)$

It's On Array
Array is fixed in size.

```
int[] a = new int[5];
```

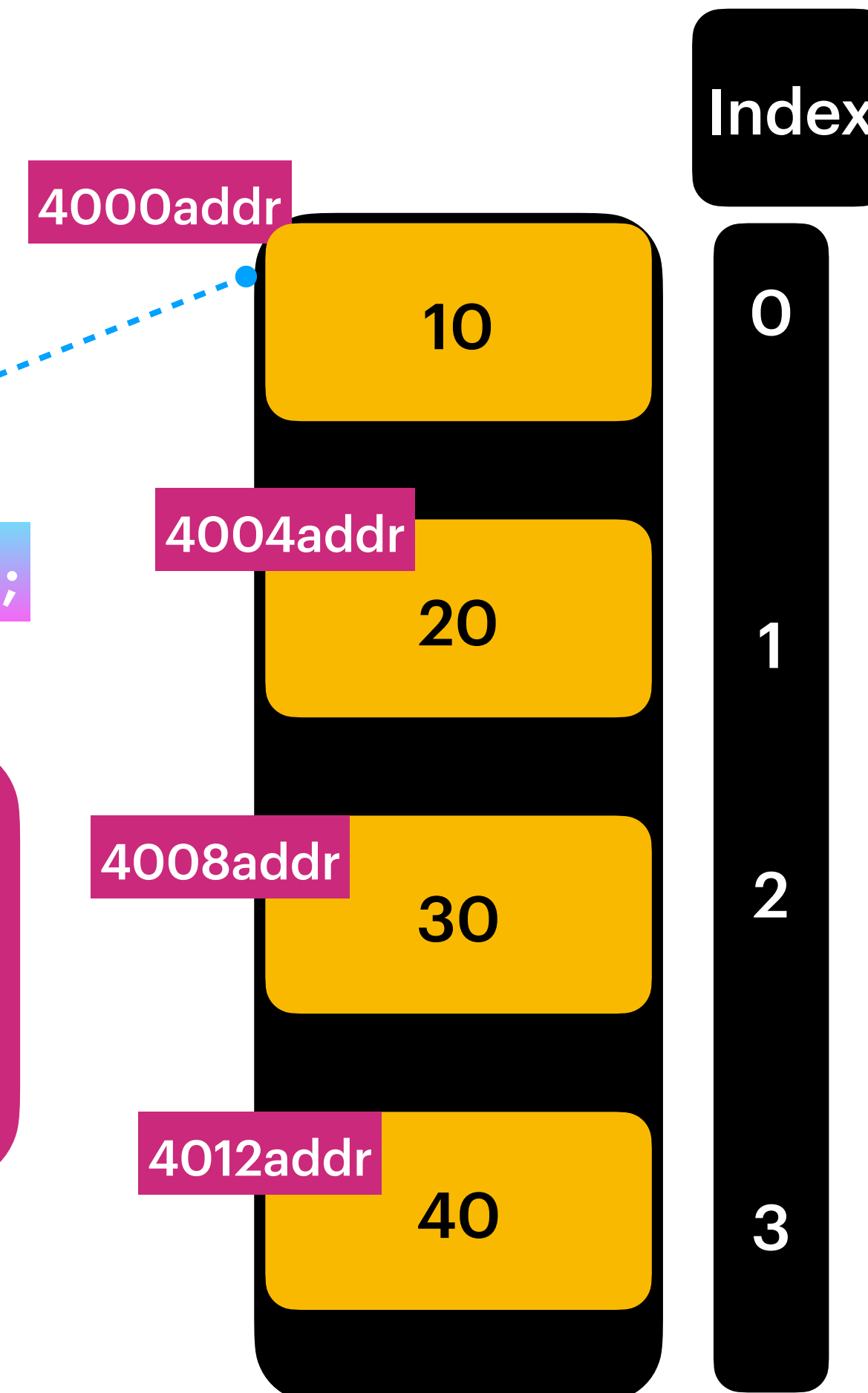
Data Deletion =>
Time Complexity :
when you delete an element
all the elements should be
moved an index before.
It's a costlier operation.
Time Complexity : $O(n)$

For Data Deletion Array is
not recommended.

```
4000addr = 10  
4004addr = 20  
4008addr = 30  
4012addr = 40
```

```
int[] a = {10,20,30,40};
```

```
a[0] = 4000 + 0*4 = 4000 addr = 10  
a[1] = 4000 + 1*4 = 4004 addr = 20  
a[2] = 4000 + 2*4 = 4008 addr = 30  
a[3] = 4000 + 3*4 = 4012 addr = 40
```



Lets Make size of array as Dynamic :::



ArrayList



Its just a wrapper on Array.



How to Implement ?

Just apply math while adding
elements to resize the array.

About ArrayList :

- => Dynamic in Size .
- => Indexbased, maintains insertion order.
- => Accesibility is faster.

Drawback :

- => Allows Duplicate elements.
- => When we remove elementstakes $O(n)$ shifts. This is constlier operation.

	Time Complexity	Space Complexity
Add Element	$O(1)$	$O(n)$
Remove Element	$O(n)$	$O(1)$
Search Element	$O(n)$	$O(1)$
Get Element based On Index	$O(1)$	$O(1)$

Go for ArrayList only when you try to access the elements.

ArrayList is not recommended when you try to remove elements frequently .