

An Introduction to Bucket Sort

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Let's see a problem

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A batsman scores the following runs in a tournament.

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29	25	3	49	9	37	21	43
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Sort the array of numbers.

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- Insertion Sort
- Bubble Sort
- Merge Sort
- Quick Sort
- etc.

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Can we sort in linear time?

Yes, we can :)

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Assumptions:

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- inputs are distributed uniformly over the range.

Back to our problem.

Index	0	1	2	3	4	5	6	7
Value	29	25	3	49	9	37	21	43

Back to our problem.

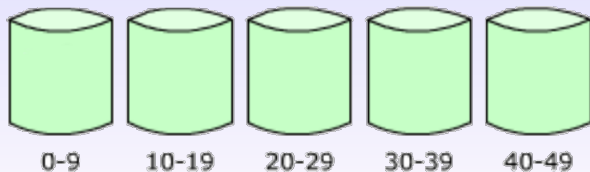
Index	0	1	2	3	4	5	6	7
Value	29	25	3	49	9	37	21	43

Here, we assume

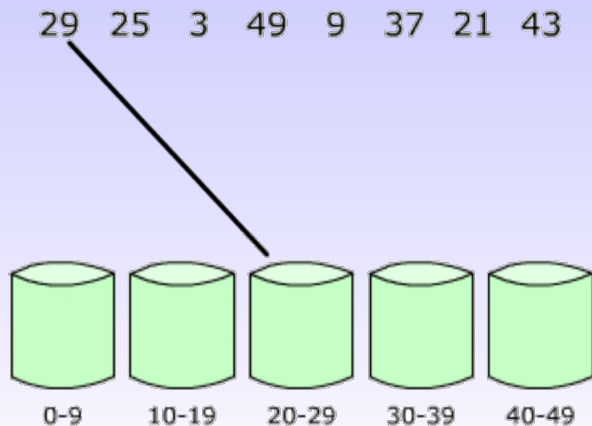
- Array size: 8
- Input range: 0-49
- Let's insert these numbers into 5 buckets.

Sorting...

29 25 3 49 9 37 21 43

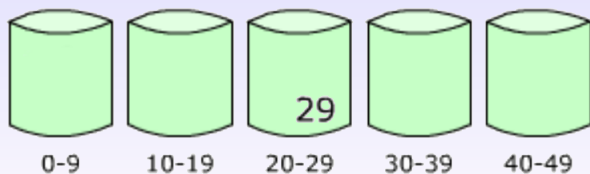


Sorting...

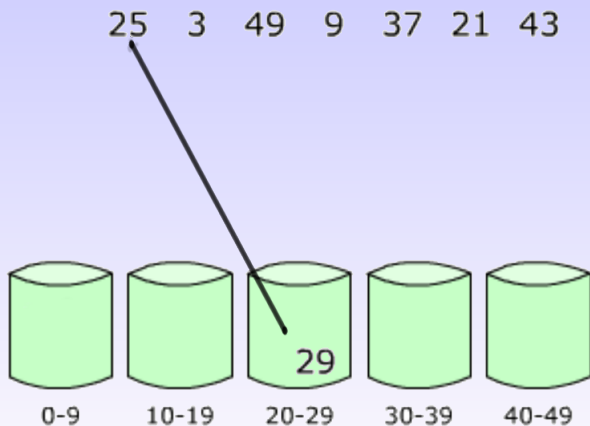


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25 3 49 9 37 21 43

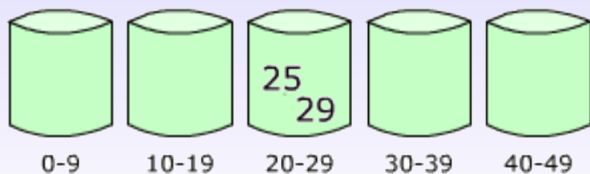


Sorting...

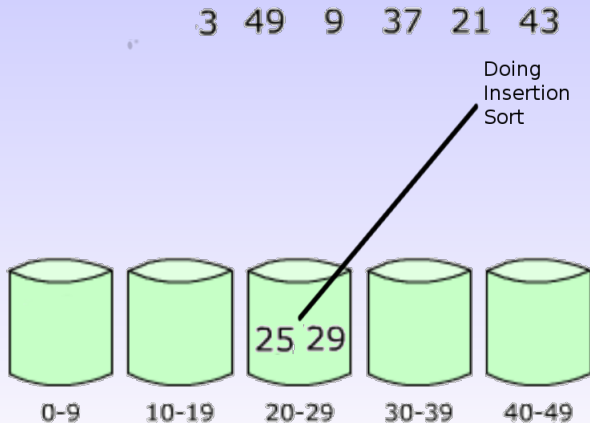


Sorting...

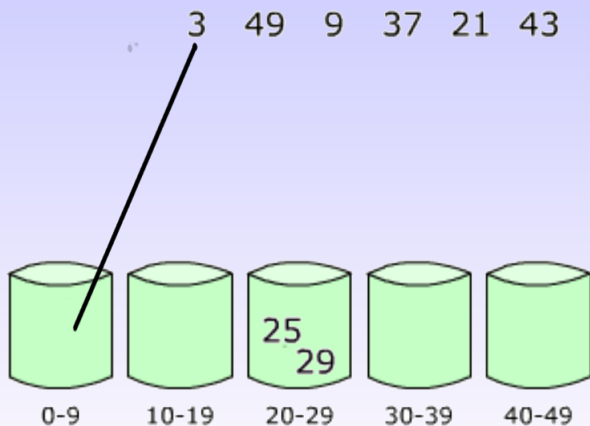
3 49 9 37 21 43



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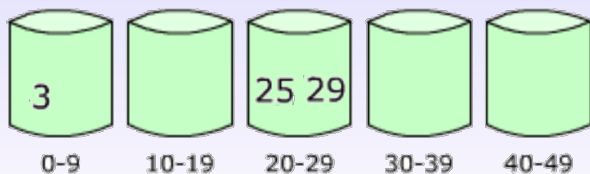


Sorting...

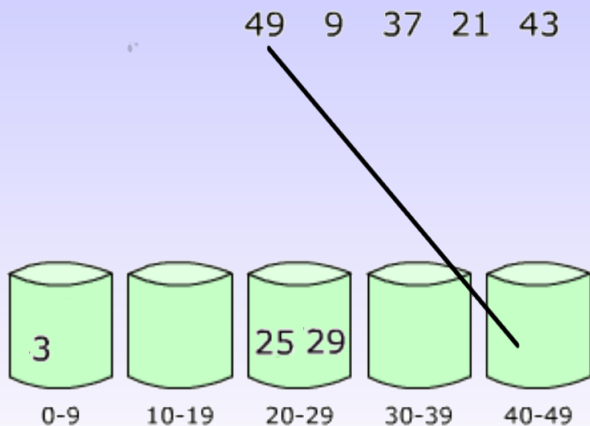


Sorting...

49 9 37 21 43

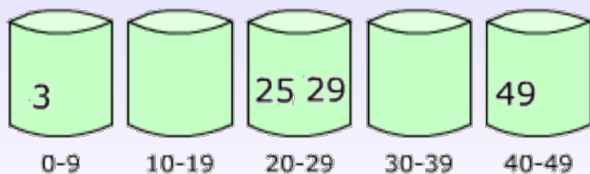


Sorting...

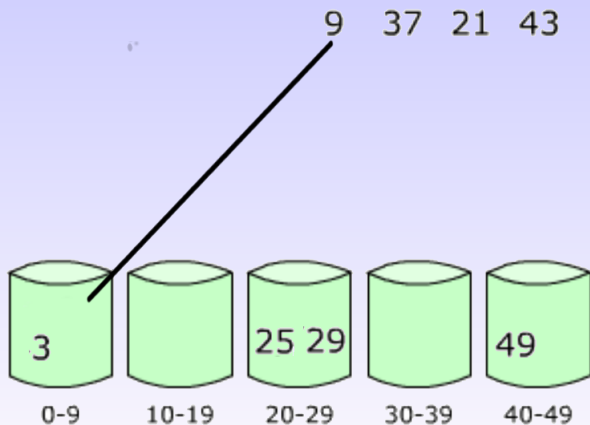


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9 37 21 43

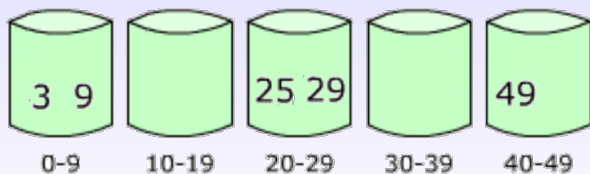


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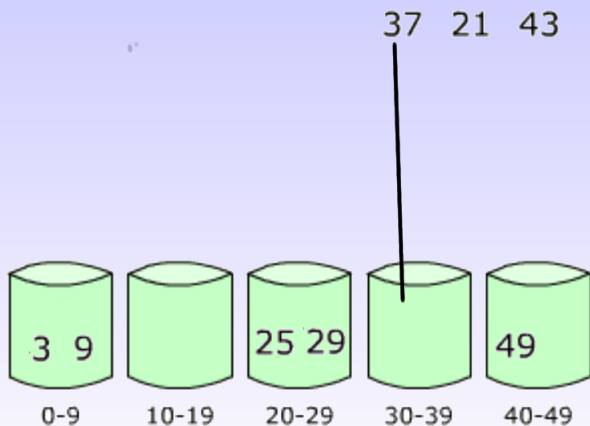


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37 21 43

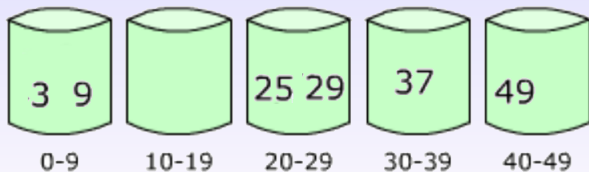


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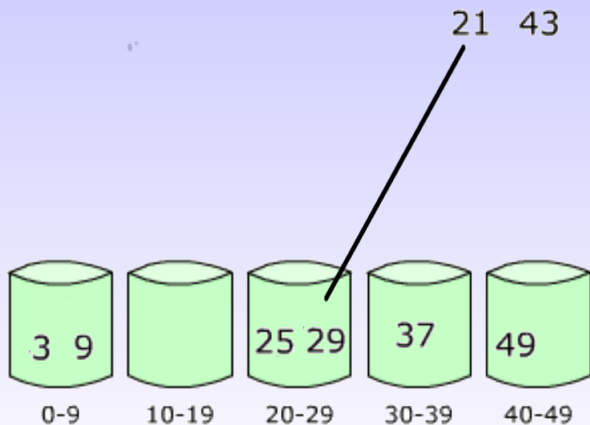


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21 43

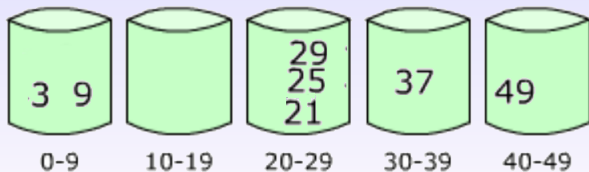


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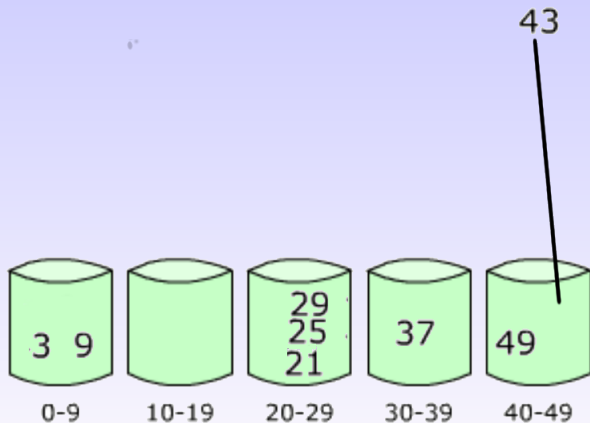


Sorting...

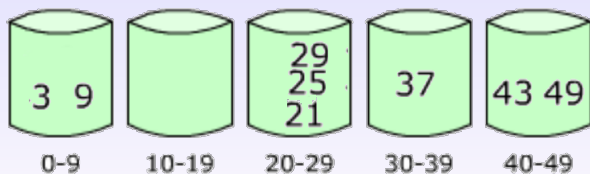
43



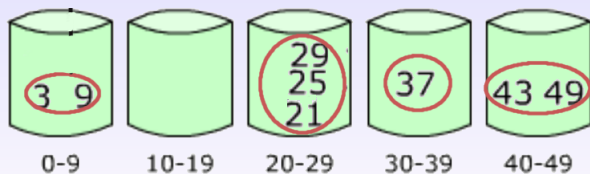
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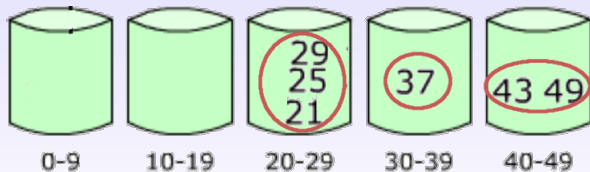


Sorting...



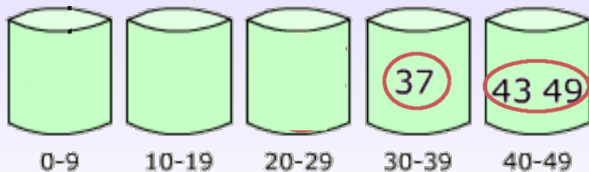
Sorting...

3 9



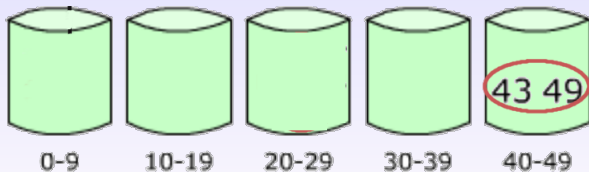
Sorting...

3 9 21 25 29



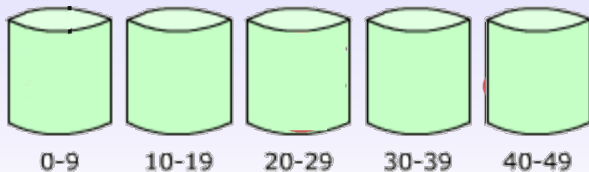
Sorting...

3 9 21 25 29 37



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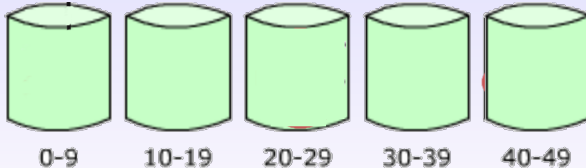
3 9 21 25 29 37 43 49



Sorting...

Sorted Array::

3 9 21 25 29 37 43 49



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- Do insertion sort while putting each number.
- Merge the buckets.

