Introduction to Radix Sort

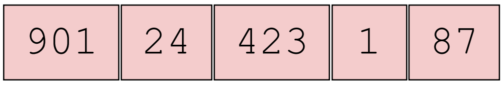
Radix sort is used to sort numbers, and works by sorting the least significant number to the most significant number. (Reading time: under 3 minutes)

A significant number is one that does not have a zero at the beginning.

20: two significant numbers, 2 and 0. The least significant number is 0, the most significant number is 2.

02: one significant number: 2. The least significant number is 2.

12.005: five significant numbers: 2, 2, 0, 0, and 5. The least significant number is 5, the most significant number is 1.



Let's say that we want to sort the array [901, 24, 423, 1, 87].

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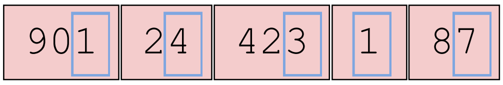

First, we get the least significant numbers of every element in the array. In this case, that results in [1, 4, 3, 1, 7]. Now, the items in the array get sorted based on the value of their least significant number. If there are two items with the same value, like 901 and 1 in this case, they get sorted based on their index. 901 comes before 1, so it stays that way.

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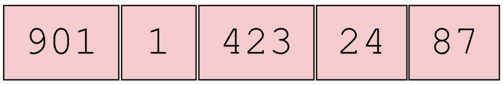

The values are now sorted based on the values of their least significant value. [1, 1, 3, 4, 7].

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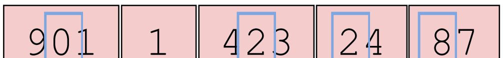

We move one significant value. If the element doesn’t contain that many numbers, its value is equal to 0. In this case, our array becomes [0, 0, 2, 2, 8]. However, the numbers are already in the right place! There is no need to sort the array in a different order.

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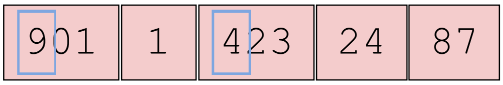

Lastly, we move one more significant value. Only two items in the array have enough numbers, so our array becomes [9, 0, 4, 0, 0]. We first sort the items with the value 0 based on their indexes, and then the items with the higher values. This results in [1, 24, 97, 423, 901].

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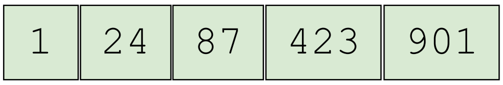

We have successfully sorted our array using radix sort!

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Now, let’s move on to the implementation of this algorithm.