TIME COMPLEXITY ANALYSIS:

* **Best Case:** If the range of values in the array is relatively small compared to the number of elements and the elements are uniformly distributed, the best-case time complexity can be considered as O(n + N), where n is the number of elements in the array and N is the range of values.
* **Worst Case:** The worst-case time complexity occurs when the range of values is significantly larger than the number of elements, causing a lot of empty pigeonholes. In the worst case, the time complexity is O(n + N), where n is the number of elements and N is the range of values. This is because we need to iterate over all the pigeonholes to reconstruct the sorted array.
* **Average Case:** The average-case time complexity is also O(n + N), assuming a uniform distribution of elements across the range of values. However, the average-case performance might be better than the worst case if the distribution is not uniform and there are fewer empty pigeonholes.