# Problemset: Sorting Algorithms

1. Find the $k^{th}$ smallest element from an array.

| Input | Output |
|---|---|
| a = [6,5,1,3,4], k = 2 | 3 |
| a = [7,9,1,8,2] , k = 4 | 8 |

2. Find the median from an array.

| Input | Output |
|---|---|
| a = [5,2,1,4,7] | 4 |
| a = [11,9,17,15] | 13 |

3. Find the smallest difference of elements from an array.

| Input | Output |
|---|---|
| a = [15,7,2,12,13] | 1 |
| a = [2,13,11,19,5] | 2 |

4. Sort an array by absolute value in ascending order.

| Input | Output |
| --- | --- |
| a = [-10, 5, -3, 7, -2] | [-2, -3, 5, 7, -10] |

5. Sort an Array of Strings according to length.

| Input | Output |
| --- | --- |
| a = ["apple", "bat", "carrot", "dog"] | ["bat", "dog", "apple", "carrot"] |

6. Sort odd indexed elements of an array in descending order and even indexed elements in ascending order.

| Input | Output |
| --- | --- |
| a = [16,17,4,18,1,20,5,12] | [1,20,4,18,5,17,16,12] |
| a = [4,3,2,1] | [2,3 ,4,1] |

7. Find the Longest Consecutive Subsequence after sorting an array.

| Input | Output |
| --- | --- |
| a = [1, 9, 3, 10, 4, 20, 2] | 4 |
| a = [3,1] | 1 |

8. Sort an array based on the frequency of its elements. If two elements have the same frequency, sort them in ascending order.

| Input | Output |
|---|---|
| a = [4, 3, 1, 6, 1, 3, 4, 4] | [4, 4, 4, 1, 1, 3, 3, 6] |

9. You are given two arrays a and b. Merge a and b into a single array sorted in non-decreasing order.

| Input | Output |
|---|---|
| a = [1,16,13,14,4]<br>b = [15,12,5,3,7] | [1,3,4,5,7,12,13,14,15,16] |

10.  You are given a list of tasks, where each task is represented as (StartTime, FinishTime). The goal is to sort the tasks based on their durations (calculated as FinishTime - StartTime) in ascending order.

| Input | Output |
|---|---|
| [(2, 5), (1, 2), (4, 6)] | [(1, 3), (4, 6), (2, 5)] |