Q3 Find the k^{th} smallest & largest element in the array.

i/p → {7, 10, 4, 3, 20, 15}
k = 3

o/p → maxi = 10
mini = 7

The approach is that if we sort the array & then find the desired elements. Like if we want to find k^{th} minimum element, then arr[k-1] is the answer. If we want to find k^{th} largest element, then arr[n-k] will be the k^{th} largest element where n is the no. of elements in the array.

Dry run

1) sort the array.

{3, 4, 7, 10, 15, 20}

2) k = 3

3rd smallest element = arr[k-1]
= 7

3rd largest element = arr[n-k]
= arr[6-3]
= arr[3]
= 10

Code

```
void findkth Min & Max Element (vector<int>& arr)
{ //Sorting array in increasing order
   sort (arr.begin(), arr.end());
```

```
// Finding kth maximum element
int n = arr.size();
int maxi = arr[n-k]; → Formulae in dry run
cout << k << "th maxi = " << maxi << endl;
// Finding kth minimum element
int mini = arr[k-1]; → Formulae in dry run
cout << k << "th mini = " << mini;
}
```

Time complexity = O(nlogn) → Sorting
Space complexity = O(1) → No extra space