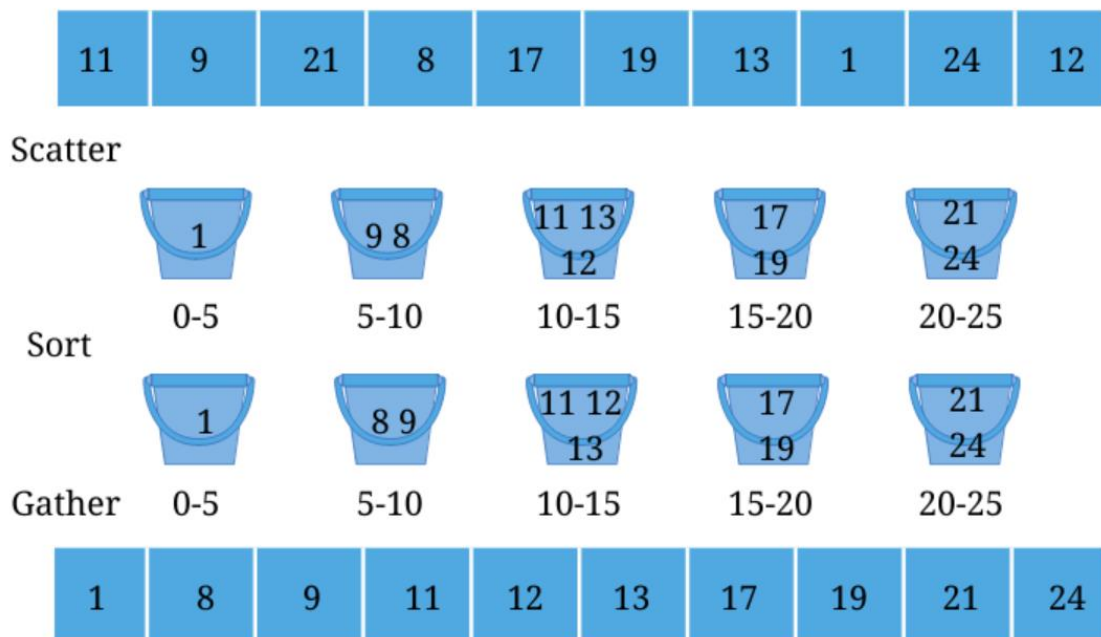# BUCKET-SORT

Bucket sort is a sorting technique that sorts the elements by first distributing or grouping the elements into several groups called buckets. Then sort the elements inside each bucket by using any sorting algorithm. For small sizes of buckets, Insertion Sort is used.

The process of Bucket Sort can be understood as a scattering-gathering approach. The elements are first scattered into various buckets then the elements of buckets are sorted. Finally, the elements are gathered in order of the bucket numbers.

Code:

```java
import java.util.*;
import java.lang.*;
import java.io.*;

public class Main
{
    public static void main (String[] args)
    {
        int arr[] = { 30,40,10,80,5,12,70 };
        int n = arr.length; int k=4;
        bucketSort(arr, n, k);

        for (int i = 0; i < n; i++)
            System.out.print( arr[i] + " ");

    }

    public static void bucketSort(int arr[], int n, int k) {

        int max=arr[0];
        for(int i=1;i<n;i++)
            max=Math.max(max,arr[i]);
```

```java
        max++;

        @SuppressWarnings("unchecked")
        Vector<Integer>[] bucket = new Vector[n];

        for (int i = 0; i < n; i++) {
            bucket[i] = new Vector<Integer>();
        }

        for (int i = 0; i < n; i++) {
            int index = (arr[i] * k)/max;
            bucket[(int)index].add(arr[i]);
        }

        for (int i = 0; i < k; i++) {
            Collections.sort(bucket[i]);
        }

        int ind = 0;
        for (int i = 0; i < k; i++) {
            for (int j = 0; j < bucket[i].size(); j++) {
                arr[ind++] = bucket[i].get(j);
            }
        }
```

```
    }
}
```