Radix Sort (기수 정렬)

데이터 길이가 같을 때 사용 가능.

Algorithm, Sort

정수

```
    public static int[] radixSort(int[] arr, int maxLen) {
        int bucketNum = 10;

        int divFactor = 1;

        Queue<Integer>[] buckets = new LinkedList[bucketNum];
        for (int j = 0; j < buckets.length; j++)
            buckets[j] = new LinkedList(); // Queue 생성

        for (int i = 0; i < maxLen; i++) {

            for (int digitIndex = 0; digitIndex < arr.length; digitIndex++)
{
                // N번째 자리 숫자 추출
                int radix = (arr[digitIndex] / divFactor) % 10;

                buckets[radix].offer(arr[digitIndex]);
            }

            int pos = 0;
            for (int bucketIndex = 0; bucketIndex < bucketNum;
bucketIndex++) {
                while (!buckets[bucketIndex].isEmpty()) {
                    arr[pos] = buckets[bucketIndex].poll();
                    pos++;
                }
            }

            divFactor *= 10;
        }
        return arr;
    }
```

문자열

전체 문자열

```
    public static String[] radixSort(String[] arr, int maxLen) {
        int bucketNum = Character.MAX_VALUE;
        int charIndex = maxLen - 1; //최대길이5이면 index 4부터 접근.
        Queue<String>[] buckets = new LinkedList[bucketNum];
        for (int j = 0; j < buckets.length; j++)
            buckets[j] = new LinkedList(); // Queue 생성

        for (int i = 0; i < maxLen; i++) {

            for (int digitIndex = 0; digitIndex < arr.length; digitIndex++)
{
                try {
                    String str = arr[digitIndex];

                    if(str.length() != maxLen) {
                        throw new Exception("[" + digitIndex + "] 문자열 길이
가 최대길이와 일치하지 않습니다.");
                    }
                    int radix = str.charAt(charIndex);
                    buckets[radix].offer(arr[digitIndex]);
                } catch (Exception e) {
                    System.err.println(e.getMessage());
                    return null;
                }
            }

            int pos = 0;
            for (int bucketIndex = 0; bucketIndex < bucketNum;
bucketIndex++) {
                while (!buckets[bucketIndex].isEmpty()) {
                    arr[pos] = buckets[bucketIndex].poll();
                    pos++;
                }
            }

            charIndex--;
        }
        return arr;
    }
```

알파벳

```
    public static String[] radixSort(String[] arr, int maxLen) {
        int bucketNum = 'z' - 'a' + 1;
        int charIndex = maxLen - 1; //최대길이5이면 index 4부터 접근.
        Queue<String>[] buckets = new LinkedList[bucketNum];
        for (int j = 0; j < buckets.length; j++)
```

```
            buckets[j] = new LinkedList(); // Queue 생성

        for (int i = 0; i < maxLen; i++) {

            for (int digitIndex = 0; digitIndex < arr.length; digitIndex++)
{
                try {
        //소문자로 변환후 비교
                    String str = arr[digitIndex].toLowerCase();

                    if(str.length() != maxLen) {
                        throw new Exception("[" + digitIndex + "] 문자열 길이
가 최대길이와 일치하지 않습니다.");
                    }
                    int radix = str.charAt(charIndex) - 'a';
                    if(radix < 0 || radix > 'z' - 'a') {
                        throw new Exception("[" + digitIndex + "] 알파벳이 아
닌 문자가 포함되어 있습니다.");
                    }
                    buckets[radix].offer(arr[digitIndex]);
                } catch (Exception e) {
                    System.err.println(e.getMessage());
                    return null;
                }
            }

            int pos = 0;
            for (int bucketIndex = 0; bucketIndex < bucketNum;
bucketIndex++) {
                while (!buckets[bucketIndex].isEmpty()) {
                    arr[pos] = buckets[bucketIndex].poll();
                    pos++;
                }
            }

            charIndex--;
        }
        return arr;
    }
```

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Last update: **2016/06/07 13:28**