

input: 2 5 1 6 11 18 14 17 8 16 3 12
9 19 15 20 4 10 7 13

Count Array

Index

0 1 1 1 1 1 1 1 1 1 1
0 1 2 3 4 5 6 7 8 9 10
1 1 1 1 1 1 1 1 1 1 1
11 12 13 14 15 16 17 18 19 20

Count array becomes

Index

0	1	2	3	4	5	6	7	8	9	10
0	1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20	
11	12	13	14	15	16	17	18	19	20	

∴ Now count array has position of all the data. We will place all element into sorted array and decrease the count.

Sorted array:

Index positions	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	11	12	13	14	15	16	17	18	19	20
	11	12	13	14	15	16	17	18	19	20

Count array.

Index	0	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9	10
	1	11	12	13	14	15	16	17	18	19	20
	11	12	13	14	15	16	17	18	19	20	

done. The array is sorted as
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

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Bucket Sort

Values

56	12	84	28	0	-13	47	94
31	12	-20	45	3	1	-12	-12
74	83	83	82	13	32	10	-18

∴ We are going to separate negative values and sort them after turning them positive, after that we will do the same with positive values and in the end, join the array.

Negative Values:

-13, -12, -12, -20, -18

Positive 13, 12, 12, 20, 18

Index Place after $[i]/20$

0

1 → 13 → 12 → 12 → 18

2 → 20

After sorting descendingly.

Index Placing after sorting by selection

0

1 → 18 → 13 → 12 → 12

2 → 20

Joining array and changing sign
Sorted Neg array.

-20, -18, -13, -12, -12

Now for positive numbers.

Index Placing after $[i]/10$

0 → 0 → 3 → 1

1 → 12 → 12 → 13 → 10

2 → 28

3 → 31 → 32

4 → 47 → 45

5 → 56

6

7 → 74

8 → 84 → 83 → 83 → 82

9 → 94

After Sorting Buckets.

Index Buckets

0 \rightarrow 0 \rightarrow 1 \rightarrow 3

1 \rightarrow 10 \rightarrow 12 \rightarrow 12 \rightarrow 13

2 \rightarrow 28

3 \rightarrow 31 \rightarrow 32

4 \rightarrow 45 \rightarrow 47

5 \rightarrow 56

6

7 \rightarrow 74

8 \rightarrow 82 \rightarrow 83 \rightarrow 83 \rightarrow 84

9 \rightarrow 94

~~10~~

Positive Sorted array:

0 1 3 10 12 12 13 28 31 32 45
47 56 74 82 83 83 94

After joining positive & Negative array

Final Sorted Array:

-20, -18, -13, -12, -12, 0, 1, 3, 10, 12
12, 13, 28, 31, 32, 45, 47, 56, 74, 82
83, 83, 94

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Radix Sort

∴ we will sort values through radix sort and show iteration of array after every step sort.

Sorted Array.
↓

Values	1s	10s	100s	1000s	10000s
48937	51190	46312	50028	50028	45385
49362	49380	45618	49029	50059	45618
49029	47871	47421	54048	50157	46132
46822	48481	46822	50059	50344	46246
51190	47421	47825	46132	51190	46312
53565	53641	50028	54137	51456	46776
50344	49362	49029	50157	52474	46822
46312	46822	46132	54187	52699	46976
49380	46312	48937	51190	53565	47244
47871	46132	54137	47244	53641	47421
51456	50344	53641	46246	54048	47825
48369	52474	50344	49294	54137	47871
48481	49294	47244	46312	54187	48369
49849	47244	46246	50344	55355	48481
52474	53565	54048	55355	45385	48937
50028	47825	49849	49362	45618	49029
54048	55355	55355	48369	46132	49294
46132	45385	51456	49380	46246	49362
54187	51456	50059	45385	46312	49380
46246	51456	49362	47421	46776	49848
54137	46246	53565	51456	46822	50028
50157	46976	48369	52474	46976	50059
49294	46776	47871	48481	47244	50157
45618	48937	52474	53565	47421	50344
52699	54187	46976	48618	47825	51190
47285	54137	46776	53641	47871	51456
46976	50157	49380	52699	48369	52474
55355	50028	48481	46776	48481	52699
45385	54048	45385	46822	48937	53565
47421	49029	54187	47825	49029	53641
46776	48369	51190	49849	49294	54048
53641	49849	49294	47871	49362	54137
50059	52699	52699	48937	49380	54187
	50059	50059	46976	49849	55355