{17, 9, 61, 23, 42, 14, 74, 85}

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 9 | 61 | 23 | 42 | 14 | 74 | 85 |

|  |  |  |  |
| --- | --- | --- | --- |
| 17 | 9 | 61 | 23 |

|  |  |  |  |
| --- | --- | --- | --- |
| 42 | 14 | 74 | 85 |

|  |  |
| --- | --- |
| 42 | 14 |

|  |  |
| --- | --- |
| 74 | 85 |

|  |  |
| --- | --- |
| 17 | 9 |

|  |  |
| --- | --- |
| 61 | 23 |

85

174

14

42

23

61

9

17

85

42

14

17

|  |  |
| --- | --- |
| 9 | 17 |

|  |  |
| --- | --- |
| 23 | 61 |

|  |  |  |  |
| --- | --- | --- | --- |
| 9 | 17 | 23 | 61 |

|  |  |  |  |
| --- | --- | --- | --- |
| 14 | 17 | 42 | 85 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 14 | 17 | 23 | 42 | 61 | 74 | 85 |

Pick a pivot

Partition

23

Quick sort

Quick sort

23

Combine

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 9 | 61 | 23 | 42 | 14 | 74 | 85 |

Step 1

Step 2 largest values in array 85

Step 3 0 to 85 indexes and each index store value 0

Let

0 1 2 3 4 5 6 7 8 9

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

10 11 12 13 14 15 16 17 18 19

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

20 21 21 22 23 24 25 26 27 28

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

29 30 31 32 33 34 35 36 37 38

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

39 40 41 42 43 44 45 46 47 48

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

49 50 51 52 53 54 55 56 57 58

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

59 60 61 62 63 64 6 5 66 6 7 68

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

69 70 71 72 73 74 75 76 77 78

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

79 80 81 82 83 84 85

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Step 4 check the elements how much time are use in array

{17, 9, 61, 23, 42, 14, 74, 85} these elements are use only one times

0 1 2 3 4 5 6 7 8 9

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

10 11 12 13 14 15 16 17 18 19

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

20 21 21 22 23 24 25 26 27 28

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

29 30 31 32 33 34 35 36 37 38

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

39 40 41 42 43 44 45 46 47 48

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

49 50 51 52 53 54 55 56 57 58

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

59 60 61 62 63 64 6 5 66 6 7 68

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

69 70 71 72 73 74 75 76 77 78

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

79 80 81 82 83 84 85

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Step 5 sorted using indexes

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 14 | 17 | 23 | 42 | 61 | 74 | 85 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 9 | 61 | 23 | 42 | 14 | 74 | 85 |

First we want to complete 2 digits number

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 17 | 09 | 61 | 23 | 42 | 14 | 74 | 85 |

Pass 1 oneth  digit

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 61 | 42 | 23 | 14 | 74 | 85 | 17 | 09 |

Pass 2 tenth digit

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 9 | 14 | 17 | 23 | 42 | 61 | 74 | 85 |

.9

8

6

7

5

4

3

2

1

0

.85

.74

.61

.42

.23

.14

.17

.85

.74

.9

.61

.42

.17

.23

.14

61 largest to parent 17 so swap

23 largest then parent 9 so swap

Swap 23 to 42

Swap 74 to 23

Swap 42 to 74

Swap 61 to 74

Swap 74 to 85

Now sorting