8.3 对下面数据表，写出采用希尔排序算法排序的每趟的结果。

(78, 100, 120, 25, 85,40, 90, 15, 60, 35, 105, 50, 30, 10, 28, 12)

第一轮 d=16/2=8

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 25 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 50 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 25 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 50 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 25 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 50 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 50 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 50 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 50 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 50 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 78 | 100 | 120 | 50 | 85 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

第二轮 d=8/2=4

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 85 | 100 | 120 | 50 | 78 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 85 | 100 | 120 | 50 | 78 | 40 | 90 | 15 | 60 | 35 | 105 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 85 | 100 | 120 | 50 | 78 | 40 | 105 | 15 | 60 | 35 | 90 | 25 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 85 | 100 | 120 | 50 | 78 | 40 | 105 | 25 | 60 | 35 | 90 | 15 | 30 | 10 | 28 | 12 |

第三轮 d=4/2=2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 120 | 100 | 105 | 50 | 90 | 40 | 85 | 25 | 78 | 35 | 60 | 15 | 30 | 10 | 28 | 12 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 120 | 100 | 105 | 50 | 90 | 40 | 85 | 35 | 78 | 25 | 60 | 15 | 30 | 12 | 28 | 10 |

第四轮 d=2/2=1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 120 | 105 | 100 | 90 | 85 | 78 | 60 | 50 | 40 | 35 | 30 | 28 | 25 | 15 | 12 | 10 |

8.4 对下面数据表，写出采用冒泡排序算法排序的每趟的结果，并标明数据移动情况。

(105, 50, 30, 25, 85, 40, 100. 12, 10, 28)

第一轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 25 | 85 | 40 | 100 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 25 | 85 | 40 | 100 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 25 | 85 | 40 | 100 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 25 | 40 | 100 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 25 | 100 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 10 | 28 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 28 | 10 |

第二轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 30 | 85 | 40 | 100 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 30 | 40 | 100 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 30 | 100 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 100 | 30 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 100 | 30 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 100 | 30 | 25 | 12 | 28 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 100 | 30 | 25 | 28 | 12 | 10 |

第三轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 50 | 85 | 40 | 100 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 40 | 100 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 40 | 100 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 25 | 28 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 28 | 25 | 12 | 10 |

第四轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 50 | 100 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 100 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 100 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 100 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 100 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

第五轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 85 | 100 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

第六轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

第七轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

第八轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 1 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

第九轮

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

结束

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 105 | 100 | 85 | 50 | 40 | 30 | 28 | 25 | 12 | 10 |

8.5 对下面数据表，写出采用快速排序算法排序的每趟的结果，并标明每趟的数据移动情况。

(50, 30, 120, 25, 85, 40, 100, 12, 90, 15, 60, 35, 105, 78, 10, 28)

以首元素50为枢轴

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 50 | **30** | **120** | **25** | **85** | **40** | **100** | **12** | **90** | **15** | **60** | **35** | **105** | **78** | **10** | **28** |

以30、78为枢轴

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 30 | **25** | **40** | **12** | **15** | **35** | **10** | **28** | 50 | 78 | **105** | **60** | **90** | **100** | **85** | **120** |

以25、35、120为枢轴

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 25 | **12** | **15** | **10** | **28** | 30 | 35 | 40 | 50 | 60 | 78 | 120 | **85** | **100** | **90** | **105** |

以12、85为枢轴

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 12 | **15** | **10** | 25 | 28 | 30 | 35 | 40 | 50 | 60 | 78 | 85 | **100** | **90** | **105** | 120 |

以105为枢轴

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 10 | 12 | 15 | 25 | 28 | 30 | 35 | 40 | 50 | 60 | 78 | 85 | 105 | **90** | **100** | 120 |

以90为枢轴

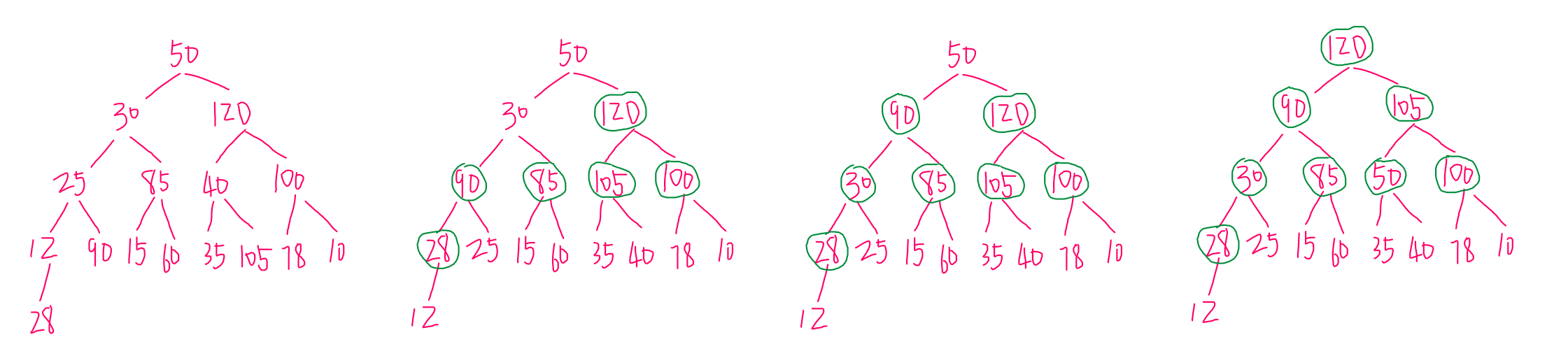
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 10 | 12 | 15 | 25 | 28 | 30 | 35 | 40 | 50 | 60 | 78 | 85 | 90 | **100** | 105 | 120 |

排序结束

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 10 | 12 | 15 | 25 | 28 | 30 | 35 | 40 | 50 | 60 | 78 | 85 | 90 | 100 | 105 | 120 |

8.10 将下面数据表分别调整为大根堆，并进行增排序。

(50, 30, 120, 25, 85, 40, 100, 12, 90, 15, 60, 35, 105, 78, 10, 28)



结果：(120, 90, 105, 30, 85, 50, 100, 28, 25, 15, 60, 35, 40, 78, 10)

增排序：

