**n=15**

**① 第一轮 h = 13**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **下标** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| 值 | 0 | 55 | 23 | 1 | 8 | 6 | 22 | 15 | 12 | 20 | 5 | 9 | 8 | 17 | 4 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **下标** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| 值 | 0 | 55 | 23 | 1 | 8 | 6 | 22 | 15 | 12 | 20 | 5 | 9 | 8 | 17 | 4 |

0 17

55 4

**比较：**17与0 （即a[13]与a[0]）

**比较并交换：**4与55 （即a[14]与a[1]）

0 17

**4** **55**

i = 14 = n

第一轮while循环结束

**②第二轮 h = h/3 = 4**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **下标** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| 值 | 0 | 4 | 23 | 1 | 8 | 6 | 22 | 15 | 12 | 20 | 5 | 9 | 8 | 17 | 55 |

0 8 12 8

4 6 20 17

23 22 5 55

1 15 9

**比较：**8与0 （即a[4]与a[0]）

**比较：**6与4 （即a[5]与a[1]）

**比较并交换：**22与23 （即a[6]与a[2]）

0 8 12 8

4 6 20 17

**22** **23** 5 55

1 15 9

**比较：**15与1 （即a[7]与a[3]）

**比较：**12与8 （即a[8]与a[4]）

**比较：**8与0 （即a[4]与a[0]）

**比较：**20与6 （即a[9]与a[5]）

**比较：**6与4 （即a[5]与a[1]）

**比较并交换：**5与23 （即a[10]与a[6]）

0 8 12 8

4 6 20 17

22 **5** **23** 55

1 15 9

**比较并交换：**5与22（即a[6]与a[2]）

0 8 12 8

4 6 20 17

**5** **22** 23 55

1 15 9

**比较并交换：**9与15 （即a[11]与a[7]）

0 8 12 8

4 6 20 17

5 22 23 55

1 **9** **15**

**比较：**9与1 （即a[7]与a[3]）

**比较并交换：**8与12

0 8 **8 12**

4 6 20 17

5 22 23 55

1 9 15

**比较：**8与8**、**8与0

**比较并交换：**17与20

0 8 8 12

4 6 **17 20**

5 22 23 55

1 9 15

**比较：**17与6、6与4

**比较：**55与23、23与22、22与5

i = 14 = n

第一轮while循环结束

**③第三轮 h = h/3 = 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **下标** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| 值 | 0 | 4 | 5 | 1 | 8 | 6 | 22 | 9 | 8 | 17 | 23 | 15 | 12 | 20 | 55 |

当h为1时，对应的希尔排序就是普通的直接插入排序

**④最终序列**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **下标** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| 值 | 0 | 1 | 4 | 5 | 6 | 8 | 8 | 9 | 12 | 15 | 17 | 20 | 22 | 23 | 55 |