AI二 b1228005 胡樂麒

1. (12,2,16,30,8,28,4,10,20,6,18)

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 12 | 2 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18 |

Insertion Sort:

取a[2]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 12 | 2 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18 |

2<12,2=2

12往後2插入

取a[3]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16 | 2 | 12 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18 |

16>12

16跟12不變

取a[4]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30 | 2 | 12 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18 |

30>16

30跟16不變

取a[5]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2 | 12 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18 |

8<30,8<16,8<12,8>2

30,16,12往後一格，8插入

取a[6]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28 | 2 | 8 | 12 | 16 | 30 | 28 | 4 | 10 | 20 | 6 | 18 |

28<30,28>16

30往後一格28插入

取a[7]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 2 | 8 | 12 | 16 | 28 | 30 | 4 | 10 | 20 | 6 | 18 |

4<30,4<28,4<16,4<12,4<8,4>2

30,28,16,12,8往後一格，4插入

取a[8]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2 | 4 | 8 | 12 | 16 | 28 | 30 | 10 | 20 | 6 | 18 |

10<30,10<28,10<16,10<12,10>8

30,28,16,12往後一格，10插入

取a[9]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20 | 2 | 4 | 8 | 10 | 12 | 16 | 28 | 30 | 20 | 6 | 18 |

20<30,20<28,20>16

30,28往後一格20插入

取a[10]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 2 | 4 | 8 | 10 | 12 | 16 | 20 | 28 | 30 | 6 | 18 |

6<30,6<28,6<20,6<16,6<12,6<10,6<8,6>4

30,28,20,16,12,10,8往後一格6插入

取a[11]

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18 | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 28 | 30 | 18 |

18<30,18<28,8<20,18>16

30,28,20往後一格18插入

完整的表格

a[0] a[1] a[2] a[3] a[4] a[5] a[6] a[7] a[8] a[9] a[10] a[11]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 18 | 20 | 28 | 30 |

Quick Sort:

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [12 | 2 | 16 | 30 | 8 | 28 | 4 | 10 | 20 | 6 | 18] | 1 | 11 |

pivot:12

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [4 | 2 | 6 | 10 | 8] | 12 | [28 | 30 | 20 | 16 | 18] | 1 | 5 |

pivot:4

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [2] | 4 | [6 | 10 | 8] | 12 | [28 | 30 | 20 | 16 | 18] | 1 | 1 |

pivot:2

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | [6 | 10 | 8] | 12 | [28 | 30 | 20 | 16 | 18] | 3 | 5 |

pivot:6

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | [10 | 8] | 12 | [28 | 30 | 20 | 16 | 18] | 4 | 5 |

povot:10

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | 8 | 10 | 12 | [28 | 30 | 20 | 16 | 18] | 7 | 11 |

povot:28

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | 8 | 10 | 12 | [16 | 18 | 20] | 28 | [30] | 7 | 9 |

pivot:16

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | 8 | 10 | 12 | 16 | [18 | 20] | 28 | [30] | 8 | 9 |

pivot:18

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | 8 | 10 | 12 | 16 | 18 | 20 | 28 | [30] | 11 | 11 |

pivot:30

完整表格

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 Left Right

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 4 | 6 | 8 | 10 | 12 | 16 | 18 | 20 | 28 | 30 |  |  |

2.

[(5, A), (3, B), (5, C)]

轉變後英文字母的部分與原先的順序不同，導致錯亂、不穩定。

[(3, B), (5, C), (5, A)]