Prueba de escritorio burbuja con señal:

Lista=[23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lista | N | Señal | i<N | j<N-i-1 | temp |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | false | 0 | 0 | 23 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | true | 0 | 1 |  |
| [-56, 23, 2, 67, 9, 44, 6, 18, 1, 7] | 10 | true | 0 | 2 | 67 |
| [-56, 23, 2, 9, 67, 44, 6, 18, 1, 7] | 10 | true | 0 | 3 | 67 |
| [-56, 23, 2, 9, 44, 67, 6, 18, 1, 7] | 10 | true | 0 | 4 | 67 |
| [-56, 23, 2, 9, 44, 6, 67, 18, 1, 7] | 10 | true | 0 | 5 | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 67, 1, 7] | 10 | true | 0 | 6 | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 1, 67, 7] | 10 | true | 0 | 7 | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 1, 7, 67] | 10 | true | 0 | 8 | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 1, 7, 67] | 10 | false | 1 | 0 |  |
| [-56, 2, 23, 9, 44, 6, 18, 1, 7, 67] | 10 | true | 1 | 1 | 23 |
| [-56, 2, 9, 23, 44, 6, 18, 1, 7, 67] | 10 | true | 1 | 2 | 23 |
| [-56, 2, 9, 23, 44, 6, 18, 1, 7, 67] | 10 | true | 1 | 3 |  |
| [-56, 2, 9, 23, 6, 44, 18, 1, 7, 67] | 10 | true | 1 | 4 | 44 |
| [-56, 2, 9, 23, 6, 18, 44, 1, 7, 67] | 10 | true | 1 | 5 | 44 |
| [-56, 2, 9, 23, 6, 18, 1, 44, 7, 67] | 10 | true | 1 | 6 | 44 |
| [-56, 2, 9, 23, 6, 18, 1, 7, 44, 67] | 10 | true | 1 | 7 | 44 |
| [-56, 2, 9, 23, 6, 18, 1, 7, 44, 67] | 10 | false | 2 | 0 |  |
| [-56, 2, 9, 23, 6, 18, 1, 7, 44, 67] | 10 | false | 2 | 1 |  |
| [-56, 2, 9, 23, 6, 18, 1, 7, 44, 67] | 10 | false | 2 | 2 |  |
| [-56, 2, 9, 6, 23, 18, 1, 7, 44, 67] | 10 | true | 2 | 3 | 23 |
| [-56, 2, 9, 6, 18, 23, 1, 7, 44, 67] | 10 | true | 2 | 4 | 23 |
| [-56, 2, 9, 6, 18, 1, 23, 7, 44, 67] | 10 | true | 2 | 5 | 23 |
| [-56, 2, 9, 6, 18, 1, 7, 23, 44, 67] | 10 | true | 2 | 6 | 23 |
| [-56, 2, 9, 6, 18, 1, 7, 23, 44, 67] | 10 | true | 2 | 7 | 23 |
| [-56, 2, 9, 6, 18, 1, 7, 23, 44, 67] | 10 | false | 3 | 0 |  |
| [-56, 2, 9, 6, 18, 1, 7, 23, 44, 67] | 10 | false | 3 | 1 |  |
| [-56, 2, 6, 9, 18, 1, 7, 23, 44, 67] | 10 | true | 3 | 2 | 9 |
| [-56, 2, 6, 9, 18, 1, 7, 23, 44, 67] | 10 | true | 3 | 3 |  |
| [-56, 2, 6, 9, 1, 18, 7, 23, 44, 67] | 10 | true | 3 | 4 | 18 |
| [-56, 2, 6, 9, 1, 7, 18, 23, 44, 67] | 10 | true | 3 | 5 | 18 |
| [-56, 2, 6, 9, 1, 7, 18, 23, 44, 67] | 10 | false | 4 | 0 |  |
| [-56, 2, 6, 9, 1, 7, 18, 23, 44, 67] | 10 | false | 4 | 1 |  |
| [-56, 2, 6, 9, 1, 7, 18, 23, 44, 67] | 10 | false | 4 | 2 |  |
| [-56, 2, 6, 1, 9, 7, 18, 23, 44, 67] | 10 | true | 4 | 3 | 9 |
| [-56, 2, 6, 1, 7, 9, 18, 23, 44, 67] | 10 | true | 4 | 4 | 9 |
| [-56, 2, 6, 1, 7, 9, 18, 23, 44, 67] | 10 | false | 5 | 0 |  |
| [-56, 2, 6, 1, 7, 9, 18, 23, 44, 67] | 10 | false | 5 | 1 |  |
| [-56, 2, 1, 6, 7, 9, 18, 23, 44, 67] | 10 | true | 5 | 2 | 6 |
| [-56, 2, 1, 6, 7, 9, 18, 23, 44, 67] | 10 | true | 5 | 3 |  |
| [-56, 2, 1, 6, 7, 9, 18, 23, 44, 67] | 10 | false | 6 | 0 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | true | 6 | 1 | 2 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | true | 6 | 2 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | false | 7 | 0 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | false | 7 | 1 |  |

Prueba de escritorio del método Shell:

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lista | n | h | i | Key | j |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 |  |  |  |
| [23, -56, 67, 2, 23, 44, 6, 18, 1, 7] | 10 | 4 | 4 | 9 | 4 |
| [9, -56, 67, 2, 23, 44, 6, 18, 1, 7] | 10 | 4 | 4 | 9 | 0 |
| [9, -56, 67, 2, 23, 44, 6, 18, 1, 7] | 10 | 4 | 5 | 44 | 5 |
| [9, -56, 67, 2, 23, 44, 67, 18, 1, 7] | 10 | 4 | 6 | 6 | 6 |
| [9, -56, 67, 2, 23, 44, 67, 18, 1, 7] | 10 | 4 | 6 | 6 | 2 |
| [9, -56, 6, 2, 23, 44, 67, 18, 1, 7] | 10 | 4 | 6 |  |  |
| [9, -56, 6, 2, 23, 44, 67, 18, 1, 7] | 10 | 4 | 7 | 18 | 7 |
| [9, -56, 6, 2, 23, 44, 67, 18, 23, 7] | 10 | 4 | 8 | 1 | 8 |
| [9, -56, 6, 2, 9, 44, 67, 18, 23, 7] | 10 | 4 | 8 | 1 | 4 |
| [1, -56, 6, 2, 9, 44, 67, 18, 23, 7] | 10 | 4 | 8 | 1 | 0 |
| [1, -56, 6, 2, 9, 44, 67, 18, 23, 44] | 10 | 4 | 9 | 7 | 9 |
| [1, -56, 6, 2, 9, 7, 67, 18, 23, 44] | 10 | 4 | 9 | 7 | 5 |
| [1, 1, 6, 2, 9, 7, 67, 18, 23, 44] | 10 | 1 | 1 | -56 | 1 |
| [-56, 1, 6, 2, 9, 7, 67, 18, 23, 44] | 10 | 1 | 1 | -56 | 0 |
| [-56, 1, 6, 2, 9, 7, 67, 18, 23, 44] | 10 | 1 | 1 | -56 | 0 |
| [-56, 1, 6, 2, 9, 7, 67, 18, 23, 44] | 10 | 1 | 2 | 6 | 2 |
| [-56, 1, 6, 6, 9, 7, 67, 18, 23, 44] | 10 | 1 | 3 | 2 | 3 |
| [-56, 1, 2, 6, 9, 7, 67, 18, 23, 44] | 10 | 1 | 3 | 2 | 2 |
| [-56, 1, 2, 6, 9, 7, 67, 18, 23, 44] | 10 | 1 | 4 | 9 | 4 |
| [-56, 1, 2, 6, 9, 9, 67, 18, 23, 44] | 10 | 1 | 5 | 7 | 5 |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 1 | 5 | 7 | 4 |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 1 | 6 | 67 | 6 |
| [-56, 1, 2, 6, 7, 9, 67, 67, 23, 44] | 10 | 1 | 7 | 18 | 7 |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 10 | 1 | 7 | 18 | 6 |
| [-56, 1, 2, 6, 7, 9, 18, 67, 67, 44] | 10 | 1 | 8 | 23 | 8 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 44] | 10 | 1 | 8 | 23 | 7 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 67] | 10 | 1 | 9 | 44 | 9 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 1 | 9 | 44 | 8 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 0 |  |  |  |

Prueba de escritorio de Selección directa:

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lista | n | minIndex | i | j | temp |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 0 | 0 | 1 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 2 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 3 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 3 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 4 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 5 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 6 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 7 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 8 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 | 9 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 0 |  | -56 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 1 | 1 | 2 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 3 | 1 | 4 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 3 | 1 | 5 |  |

……A partir de aquí lo único que cambia es la j hasta la posición 8

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 8 | 1 | 8 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 8 | 1 | 9 |  |
| [-56, 1, 67, 2, 9, 44, 6, 18, 23, 7] | 10 | 8 | 1 |  | 1 |
| [-56, 1, 67, 2, 9, 44, 6, 18, 23, 7] | 10 | 2 | 2 | 3 |  |
| [-56, 1, 67, 2, 9, 44, 6, 18, 23, 7] | 10 | 3 | 2 | 3 |  |
| [-56, 1, 67, 2, 9, 44, 6, 18, 23, 7] | 10 | 3 | 2 | 4 |  |

……A partir de aquí lo único que cambia es la j hasta la posición 9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [-56, 1, 67, 2, 9, 44, 6, 18, 23, 7] | 10 | 3 | 2 | 9 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 3 | 2 |  | 2 |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 3 | 3 | 4 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 4 | 3 | 4 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 4 | 3 | 5 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 6 | 3 | 6 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 6 | 3 | 7 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 6 | 3 | 8 |  |
| [-56, 1, 2, 67, 9, 44, 6, 18, 23, 7] | 10 | 6 | 3 | 9 |  |
| [-56, 1, 2, 6, 9, 44, 67, 18, 23, 7] | 10 | 6 | 3 |  | 6 |
| [-56, 1, 2, 6, 9, 44, 67, 18, 23, 7] | 10 | 4 | 4 | 5 |  |
| [-56, 1, 2, 6, 9, 44, 67, 18, 23, 7] | 10 | 4 | 4 | 6 |  |

……A partir de aquí lo único que cambia es la j hasta la posición 9

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 10 | 9 | 4 |  | 7 |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 10 | 5 | 5 | 6 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 10 | 7 | 5 | 7 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 10 | 7 | 5 | 8 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 10 | 9 | 5 | 9 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 9 | 5 |  | 9 |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 6 | 6 | 7 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 7 | 6 | 7 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 7 | 6 | 8 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 10 | 7 | 6 | 9 |  |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 10 | 7 | 6 |  | 18 |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 10 | 8 | 7 | 8 |  |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 10 | 8 | 7 | 9 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 44] | 10 | 8 | 7 |  | 23 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 44] | 10 | 9 | 8 | 9 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 66] | 10 | 9 | 8 |  | 44 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 66] | 10 |  |  |  |  |

Prueba de escritorio de Inserción directa:

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Lista | n | Key | i | j |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | -56 | 1 | -1 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 67 | 2 | 1 |  |
| [-56, 23, 67, 67, 9, 44, 6, 18, 1, 7] | 10 | 2 | 3 | 2 |  |
| [-56, 23, 23, 67, 9, 44, 6, 18, 1, 7] | 10 | 2 | 3 | 1 |  |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 10 | 2 | 3 | 0 |  |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 10 | 9 | 4 | 3 |  |
| [-56, 2, 23, 67, 67, 44, 6, 18, 1, 7] | 10 | 9 | 4 | 2 |  |
| [-56, 2, 23, 23, 67, 44, 6, 18, 1, 7] | 10 | 9 | 4 | 1 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 10 |  | 4 |  |  |
| [-56, 2, 9, 23, 67, 67, 6, 18, 1, 7] | 10 | 44 | 5 | 4 |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 10 | 44 | 5 | 3 |  |
| [-56, 2, 9, 23, 44, 67, 67, 18, 1, 7] | 10 | 6 | 6 | 5 |  |
| [-56, 2, 9, 23, 44, 44, 67, 18, 1, 7] | 10 | 6 | 6 | 4 |  |
| [-56, 2, 9, 23, 23, 44, 67, 18, 1, 7] | 10 | 6 | 6 | 3 |  |
| [-56, 2, 9, 9, 23, 44, 67, 18, 1, 7] | 10 | 6 | 6 | 2 |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 10 | 6 | 6 | 1 |  |
| [-56, 2, 6, 9, 23, 44, 67, 67, 1, 7] | 10 | 18 | 7 | 6 |  |
| [-56, 2, 6, 9, 23, 44, 44, 67, 1, 7] | 10 | 18 | 7 | 5 |  |
| [-56, 2, 6, 9, 23, 23, 44, 67, 1, 7] | 10 | 18 | 7 | 4 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 10 | 18 | 7 | 3 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 67, 7] | 10 | 1 | 8 | 7 |  |
| [-56, 2, 6, 9, 18, 23, 44, 44, 67, 7] | 10 | 1 | 8 | 6 |  |
| [-56, 2, 6, 9, 18, 23, 23, 44, 67, 7] | 10 | 1 | 8 | 5 |  |
| [-56, 2, 6, 9, 18, 18, 23, 44, 67, 7] | 10 | 1 | 8 | 4 |  |
| [-56, 2, 6, 9, 9, 18, 23, 44, 67, 7] | 10 | 1 | 8 | 3 |  |
| [-56, 2, 6, 6, 9, 18, 23, 44, 67, 7] | 10 | 1 | 8 | 2 |  |
| [-56, 2, 2, 6, 9, 18, 23, 44, 67, 7] | 10 | 1 | 8 | 1 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 10 | 1 | 8 | 0 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 67] | 10 | 7 | 9 | 8 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 44, 67] | 10 | 7 | 9 | 7 |  |
| [-56, 1, 2, 6, 9, 18, 23, 23, 44, 67] | 10 | 7 | 9 | 6 |  |
| [-56, 1, 2, 6, 9, 18, 18, 23, 44, 67] | 10 | 7 | 9 | 5 |  |
| [-56, 1, 2, 6, 9, 9, 18, 23, 44, 67] | 10 | 7 | 9 | 4 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 7 | 9 | 3 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 |  |  |  |  |

Prueba de escritorio método HeapSort

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lista | n | i | Largest | left | right | temp |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 4 | 4 | 9 | 10 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 10 | 3 | 3 | 7 | 8 |  |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 3 | 7 | 7 | 8 | 2 |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 7 | 7 | 15 | 16 |  |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 3 | 7 |  |  |  |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 2 | 2 | 5 | 6 |  |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 1 |  |  |  |  |
| [23, -56, 67, 18, 9, 44, 6, 2, 1, 7] | 10 | 1 | 1 | 3 | 4 |  |
| [23, 18, 67, -56, 9, 44, 6, 2, 1, 7] | 10 | 1 | 3 | 3 | 4 | -56 |
| [23, 18, 67, -56, 9, 44, 6, 2, 1, 7] | 10 | 3 | 3 | 7 | 8 |  |
| [23, 18, 67, 2, 9, 44, 6, -56, 1, 7] | 10 | 3 | 7 | 7 | 8 | -56 |
| [23, 18, 67, 2, 9, 44, 6, -56, 1, 7] | 10 | 7 | 7 | 15 | 16 |  |
| [23, 18, 67, 2, 9, 44, 6, -56, 1, 7] | 10 | 1 |  |  |  |  |
| [23, 18, 67, 2, 9, 44, 6, -56, 1, 7] | 10 | 0 | 0 | 1 | 2 |  |
| [67, 18, 23, 2, 9, 44, 6, -56, 1, 7] | 10 | 0 | 2 | 1 | 2 | 23 |
| [67, 18, 23, 2, 9, 44, 6, -56, 1, 7] | 10 | 2 | 2 | 5 | 6 |  |
| [67, 18, 44, 2, 9, 23, 6, -56, 1, 7] | 10 | 2 | 5 | 5 | 6 | 23 |
| [67, 18, 44, 2, 9, 23, 6, -56, 1, 7] | 10 | 5 | 5 | 11 | 12 |  |
| [67, 18, 44, 2, 9, 23, 6, -56, 1, 7] | 10 | 0 |  |  |  |  |
| [7, 18, 44, 2, 9, 23, 6, -56, 1, 67] | 10 | 9 | 67 |  |  |  |
| [7, 18, 44, 2, 9, 23, 6, -56, 1, 67] | 9 | 0 | 0 | 1 | 2 |  |
| [7, 18, 44, 2, 9, 23, 6, -56, 1, 67] | 9 | 0 | 1 | 1 | 2 |  |
| [44, 18, 7, 2, 9, 23, 6, -56, 1, 67] | 9 | 0 | 2 | 1 | 2 | 7 |
| [44, 18, 7, 2, 9, 23, 6, -56, 1, 67] | 9 | 2 | 2 | 5 | 6 |  |
| [44, 18, 23, 2, 9, 7, 6, -56, 1, 67] | 9 | 2 | 5 | 5 | 6 | 7 |
| [44, 18, 23, 2, 9, 7, 6, -56, 1, 67] | 9 | 5 | 5 | 11 | 12 |  |
| [44, 18, 23, 2, 9, 7, 6, -56, 1, 67] | 10 | 9 |  |  |  |  |
| [1, 18, 23, 2, 9, 7, 6, -56, 44, 67] | 10 | 8 |  |  |  | 44 |
| [1, 18, 23, 2, 9, 7, 6, -56, 44, 67] | 8 | 0 | 0 | 1 | 2 |  |
| [1, 18, 23, 2, 9, 7, 6, -56, 44, 67] | 8 | 0 | 1 | 1 | 2 |  |
| [23, 18, 1, 2, 9, 7, 6, -56, 44, 67] | 8 | 0 | 2 | 1 | 2 | 1 |
| [23, 18, 1, 2, 9, 7, 6, -56, 44, 67] | 8 | 2 | 2 | 5 | 6 |  |
| [23, 18, 7, 2, 9, 1, 6, -56, 44, 67] | 8 | 2 | 5 | 5 | 6 | 1 |
| [23, 18, 7, 2, 9, 1, 6, -56, 44, 67] | 8 | 5 | 5 | 11 | 12 |  |
| [23, 18, 7, 2, 9, 1, 6, -56, 44, 67] | 10 | 8 |  |  |  |  |
| [-56, 18, 7, 2, 9, 1, 6, 23, 44, 67] | 10 | 7 |  |  |  | 23 |
| [-56, 18, 7, 2, 9, 1, 6, 23, 44, 67] | 7 | 0 | 0 | 1 | 2 |  |
| [18, -56, 7, 2, 9, 1, 6, 23, 44, 67] | 7 | 0 | 1 | 1 | 2 | -56 |
| [18, -56, 7, 2, 9, 1, 6, 23, 44, 67] | 7 | 1 | 1 | 3 | 4 |  |
| [18, -56, 7, 2, 9, 1, 6, 23, 44, 67] | 7 | 1 | 3 |  |  |  |
| [18, 9, 7, 2, -56, 1, 6, 23, 44, 67] | 7 | 1 | 4 |  |  | -56 |
| [18, 9, 7, 2, -56, 1, 6, 23, 44, 67] | 7 | 4 | 4 | 9 | 10 |  |
| [18, 9, 7, 2, -56, 1, 6, 23, 44, 67] | 10 | 7 |  |  |  |  |
| [6, 9, 7, 2, -56, 1, 18, 23, 44, 67] | 10 | 6 |  |  |  | 18 |
| [6, 9, 7, 2, -56, 1, 18, 23, 44, 67] | 6 | 0 | 0 | 1 | 2 |  |
| [9, 6, 7, 2, -56, 1, 18, 23, 44, 67] | 6 | 0 | 1 | 1 | 2 | 6 |
| [9, 6, 7, 2, -56, 1, 18, 23, 44, 67] | 6 | 1 | 1 | 3 | 4 |  |
| [9, 6, 7, 2, -56, 1, 18, 23, 44, 67] | 10 | 6 |  |  |  |  |
| [1, 6, 7, 2, -56, 9, 18, 23, 44, 67] | 10 | 5 |  |  |  | 9 |
| [1, 6, 7, 2, -56, 9, 18, 23, 44, 67] | 5 | 0 | 0 | 1 | 2 |  |
| [1, 6, 7, 2, -56, 9, 18, 23, 44, 67] | 5 | 0 | 1 | 1 | 2 |  |
| [7, 6, 1, 2, -56, 9, 18, 23, 44, 67] | 5 | 0 | 2 | 1 | 2 | 1 |
| [7, 6, 1, 2, -56, 9, 18, 23, 44, 67] | 5 | 2 | 2 | 5 | 6 |  |
| [7, 6, 1, 2, -56, 9, 18, 23, 44, 67] | 10 | 5 |  |  |  |  |
| [-56, 6, 1, 2, 7, 9, 18, 23, 44, 67] | 10 | 4 |  |  |  | 7 |
| [-56, 6, 1, 2, 7, 9, 18, 23, 44, 67] | 4 | 0 | 0 | 1 | 2 |  |
| [6, -56, 1, 2, 7, 9, 18, 23, 44, 67] | 4 | 0 | 1 | 1 | 2 | -56 |
| [6, -56, 1, 2, 7, 9, 18, 23, 44, 67] | 4 | 1 | 1 | 3 | 4 |  |
| [6, 2, 1, -56, 7, 9, 18, 23, 44, 67] | 4 | 1 | 3 | 3 | 4 | -56 |
| [6, 2, 1, -56, 7, 9, 18, 23, 44, 67] | 4 | 3 | 3 | 7 | 8 |  |
| [6, 2, 1, -56, 7, 9, 18, 23, 44, 67] | 10 | 4 |  |  |  |  |
| [-56, 2, 1, 6, 7, 9, 18, 23, 44, 67] | 10 | 3 |  |  |  | 6 |
| [-56, 2, 1, 6, 7, 9, 18, 23, 44, 67] | 3 | 0 | 0 | 1 | 2 |  |
| [2, -56, 1, 6, 7, 9, 18, 23, 44, 67] | 3 | 0 | 1 | 1 | 2 | -56 |
| [2, -56, 1, 6, 7, 9, 18, 23, 44, 67] | 3 | 1 | 1 | 3 | 4 |  |
| [2, -56, 1, 6, 7, 9, 18, 23, 44, 67] | 10 | 3 |  |  |  |  |
| [1, -56, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 2 |  |  |  | 2 |
| [1, -56, 2, 6, 7, 9, 18, 23, 44, 67] | 2 | 0 | 0 | 1 | 2 | 2 |
| [1, -56, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 2 |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 1 |  |  |  | 1 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 1 | 0 | 0 | 1 | 2 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 | 1 |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 10 |  |  |  |  |  |

Prueba de escritorio Quicksort recursivo

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lista | low | high | Pivot/index | i | j | temp |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | -1 | 0 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 0 | 1 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] |  |  |  | 0 | 1 | 23 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 0 | 2 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 1 | 3 |  |
| [-56, 2, 67, 23, 9, 44, 6, 18, 1, 7] |  |  |  | 1 | 3 | 23 |
| [-56, 2, 67, 23, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 1 | 3 |  |
| [-56, 2, 67, 23, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 1 | 4 |  |
| [-56, 2, 67, 23, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 1 | 5 |  |
| [-56, 2, 67, 23, 9, 44, 6, 18, 1, 7] | 0 | 9 | 7 | 2 | 6 |  |
| [-56, 2, 6, 23, 9, 44, 67, 18, 1, 7] |  |  |  | 2 | 6 | 67 |
| [-56, 2, 6, 23, 9, 44, 67, 18, 1, 7] | 0 | 9 | 7 | 2 | 7 |  |
| [-56, 2, 6, 23, 9, 44, 67, 18, 1, 7] | 0 | 9 | 7 | 3 | 8 |  |
| [-56, 2, 6, 1, 9, 44, 67, 18, 23, 7] |  |  |  | 3 | 8 | 23 |
| [-56, 2, 6, 1, 9, 44, 67, 18, 23, 7] | 0 | 9 | 7 | 3 | 8 |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] |  |  |  | 4 | 9 | 9 |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 9 | 7 | 3 |  |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 9 | 4 |  |  |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 |  |  |  |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | -1 | 0 |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | 0 | 0 |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] |  |  |  | 0 | 0 | -56 |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | 0 | 1 |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | 0 | 2 |  |
| [-56, 2, 6, 1, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | 0 |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] |  |  |  | 1 | 3 | 2 |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 | 0 |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 |  |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 0 | 0 |  |  |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 0 | 3 | 1 |  |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 2 | 3 | 1 |  |  |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 2 | 3 | 2 | 1 | 2 |  |
| [-56, 1, 6, 2, 7, 44, 67, 18, 23, 9] | 2 | 3 | 2 | 1 |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 2 | 3 | 2 |  |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 2 | 1 |  |  |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 2 | 3 | 2 |  |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 3 | 3 |  |  |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 0 | 9 | 4 |  |  |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 5 | 9 | 9 | 4 | 5 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 5 | 9 | 9 | 4 | 6 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 5 | 9 | 9 | 4 | 7 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 5 | 9 | 9 | 4 | 8 |  |
| [-56, 1, 2, 6, 7, 44, 67, 18, 23, 9] | 5 | 9 | 9 | 4 |  |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 5 | 9 | 9 | 5 | 9 | 44 |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 5 | 9 | 9 | 4 |  |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 5 | 9 | 5 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 5 | 6 |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 6 | 9 | 44 | 5 | 6 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 6 | 9 | 44 | 5 | 7 |  |
| [-56, 1, 2, 6, 7, 9, 67, 18, 23, 44] | 6 | 9 | 44 | 6 | 7 |  |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] |  |  |  | 6 | 7 | 67 |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 6 | 9 | 44 | 6 | 7 |  |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 6 | 9 | 44 | 6 | 8 |  |
| [-56, 1, 2, 6, 7, 9, 18, 67, 23, 44] | 6 | 9 | 44 | 7 | 8 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 44] |  |  |  | 7 | 8 | 67 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 67, 44] | 6 | 9 | 44 | 7 | 8 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |  |  | 8 | 9 | 67 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 9 | 44 | 7 |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 9 | 8 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 | 23 | 5 | 6 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |  |  | 6 | 6 | 18 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 | 23 | 6 | 6 |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 | 23 | 6 |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |  |  | 7 | 7 | 23 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 | 23 | 6 |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 |  | 7 |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 6 |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 7 | 7 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 8 | 7 |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 | 9 | 8 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 9 | 9 |  |  |  |  |

Prueba de escritorio Radix

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lista | Max | i | exp | n | digit |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 23 | 1 |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 23 | 2 |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 2 |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 3 |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 4 |  |  |  |  |

……A partir de aquí lo único que cambia es la i hasta la posición 9

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 9 |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 |  | 1 | 10 |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 0 | 1 | 10 |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 1 | 1 | 10 |  |  |

……A partir de aquí lo único que cambia es la i hasta la posición 9

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 67 | 9 | 1 | 10 |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]  [0, 0, 0, 1, 0, 0, 0, 0, 0] | 67 | 0 | 1 | 10 | 3 |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]  [0, 0, 0, 1, 0, 0, 0, 0, 0] | 67 | 1 | 1 | 10 | -6 |  |

En este método sale error al intentar acomodar el arreglo ya que no acepta números negativos

Prueba de escritorio método externo Intercalación

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lista | left | right | mid | i | j | k | tem | x |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | 4 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 0 |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 1 | 1 | 0 |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 | 1 | 0 | [-56, 0] |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 | 2 | 1 | [-56, 23] |  |
| [-56, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 1 | 2 | 2 | [-56, 23] | 0 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 1 | 2 | 2 | [-56, 23] | 1 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 | 2 |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 0 | 2 | 0 | [0, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 0 | 2 | 0 | [-56, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 1 | 2 | 1 | [-56, 23, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 2 | 2 | [-56, 23, 67] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 3 | 3 | [-56, 23, 67] | 0 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 3 | 3 | [-56, 23, 67] | 1 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 3 | 3 | [-56, 23, 67] | 2 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 4 | 4 |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 3 | 4 | 0 | [0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 4 | 4 | 1 | [2, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 4 | 5 | 2 | [2, 9] | 0 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 4 | 5 | 2 | [2, 9] | 1 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 0 | 3 | 0 | [0, 0, 0, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 0 | 3 | 0 | [-56, 0, 0, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 3 | 1 | [-56, 2, 0, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 4 | 2 | [-56, 2, 9, 0, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 5 | 3 | [-56, 2, 9, 23, 0] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 2 | 5 | 4 | [-56, 2, 9, 23, 67] |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | 0 |
| [-56, 2, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | 1 |
| [-56, 2, 9, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | 2 |
| [-56, 2, 9, 23, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | 3 |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | 4 |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 4 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 9 | 4 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 9 | 7 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 7 | 6 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 5 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 6 | 6 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 | 5 | 6 | 0 | [0, 0] |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 | 5 | 6 | 0 | [6, 0] |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 | 5 | 7 | 1 | [6, 44] |  |
| [-56, 2, 9, 23, 67, 6, 6, 18, 1, 7] | 5 | 6 | 5 | 6 | 7 | 2 | [6, 44] | 0 |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 6 | 5 | 6 | 7 | 2 | [6, 44] | 1 |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 6 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 7 | 7 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 5 | 7 | 0 | [0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 5 | 7 | 0 | [6, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 6 | 7 | 1 | [6, 18, 0] |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 6 | 8 | 2 | [6, 18, 44] |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 7 | 8 | 3 | [6, 18, 44] | 0 |
| [-56, 2, 9, 23, 67, 6, 18, 18, 1, 7] | 5 | 7 | 6 | 7 | 8 | 3 | [6, 18, 44] | 1 |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 7 | 6 | 7 | 8 | 3 | [6, 18, 44] | 2 |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 7 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 8 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 9 | 9 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  | [0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 8 | 9 | 0 | [1, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 9 | 9 | 1 | [1, 7] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 9 | 10 | 2 | [1, 7] | 0 |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 9 | 10 | 2 | [1, 7] | 1 |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  |  |  | [0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 5 | 8 | 0 | [1, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 5 | 9 | 1 | [1, 6, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 6 | 9 | 2 | [1, 6, 7, 0, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 6 | 10 | 3 | [1, 6, 7, 18, 0] |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 7 | 10 | 4 | [1, 6, 7, 18, 44] |  |
| [-56, 2, 9, 23, 67, 1, 18, 44, 1, 7] | 5 | 9 | 7 | 8 | 10 | 5 | [1, 6, 7, 18, 44] | 0 |
| [-56, 2, 9, 23, 67, 1, 6, 44, 1, 7] | 5 | 9 | 7 | 8 | 10 | 5 | [1, 6, 7, 18, 44] | 1 |
| [-56, 2, 9, 23, 67, 1, 6, 7, 1, 7] | 5 | 9 | 7 | 8 | 10 | 5 | [1, 6, 7, 18, 44] | 2 |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 7] | 5 | 9 | 7 | 8 | 10 | 5 | [1, 6, 7, 18, 44] | 3 |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 5 | 9 | 7 | 8 | 10 | 5 | [1, 6, 7, 18, 44] | 4 |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 5 | 9 | 4 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  |  |  | [0, 0, 0, 0, 0, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 0 | 5 | 0 | [-56, 0, 0, 0, 0, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 1 | 5 | 1 | [-56, 1, 0, 0, 0, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 1 | 6 | 2 | [-56, 1, 2, 0, 0, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 6 | 3 | [-56, 1, 2, 6, 0, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 7 | 4 | [-56, 1, 2, 6, 7, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 8 | 5 | [-56, 1, 2, 6, 7, 0, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 8 | 5 | [-56, 1, 2, 6, 7, 9, 0, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 3 | 8 | 6 | [-56, 1, 2, 6, 7, 9, 18, 0, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 3 | 9 | 7 | [-56, 1, 2, 6, 7, 9, 18, 23, 0, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 4 | 9 | 8 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 0] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 4 | 10 | 9 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 |
| [-56, 1, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 1 |
| [-56, 1, 2, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 2 |
| [-56, 1, 2, 6, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 |
| [-56, 1, 2, 6, 7, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 4 |
| [-56, 1, 2, 6, 7, 9, 6, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 5 |
| [-56, 1, 2, 6, 7, 9, 18, 7, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 6 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 18, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 7 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 44] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 8 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 | 9 | 4 | 5 | 10 | 10 | [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 9 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 | 9 |  |  |  |  |  |  |

Método de ordenamiento Doble burbuja con señal

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Lista | left | right | swapped | i | j | temp | k |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | false | 0 |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] |  |  |  | 0 | 1 | 23 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | true | 1 |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 | true | 2 |  |  |  |
| [-56, 23, 2, 67, 9, 44, 6, 18, 1, 7] |  |  |  | 2 | 3 | 67 |  |
| [-56, 23, 2, 67, 9, 44, 6, 18, 1, 7] | 0 | 9 | true | 3 |  |  |  |
| [-56, 23, 2, 9, 67, 44, 6, 18, 1, 7] |  |  |  | 3 | 4 |  | 67 |
| [-56, 23, 2, 9, 67, 44, 6, 18, 1, 7] | 0 | 9 | true | 4 |  |  |  |
| [-56, 23, 2, 9, 44, 67, 6, 18, 1, 7] |  |  |  | 4 | 5 |  | 67 |
| [-56, 23, 2, 9, 44, 67, 6, 18, 1, 7] | 0 | 9 | true | 5 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 67, 18, 1, 7] |  |  |  | 5 | 6 |  | 67 |
| [-56, 23, 2, 9, 44, 6, 67, 18, 1, 7] | 0 | 9 | true | 6 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 18, 67, 1, 7] |  |  |  | 6 | 7 |  | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 67, 1, 7] | 0 | 9 | true | 7 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 18, 1, 67, 7] |  |  |  | 7 | 8 |  | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 1, 67, 7] | 0 | 9 | true | 8 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 18, 1, 7, 67] |  |  |  | 8 | 9 |  | 67 |
| [-56, 23, 2, 9, 44, 6, 18, 1, 7, 67] | 0 | 8 | true | 8 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 18, 1, 7, 67] | 0 | 8 | true | 7 |  |  |  |
| [-56, 23, 2, 9, 44, 6, 1, 18, 7, 67] |  |  |  | 7 | 6 |  | 1 |
| [-56, 23, 2, 9, 44, 6, 1, 18, 7, 67] | 0 | 8 | true | 6 |  |  |  |
| [-56, 23, 2, 9, 44, 1, 6, 18, 7, 67] |  |  |  | 6 | 5 |  | 1 |
| [-56, 23, 2, 9, 44, 1, 6, 18, 7, 67] | 0 | 8 | true | 5 |  |  |  |
| [-56, 23, 2, 9, 1, 44, 6, 18, 7, 67] |  |  |  | 5 | 4 |  | 1 |
| [-56, 23, 2, 9, 1, 44, 6, 18, 7, 67] | 0 | 8 | true | 4 |  |  |  |
| [-56, 23, 2, 1, 9, 44, 6, 18, 7, 67] |  |  |  | 4 | 3 |  | 1 |
| [-56, 23, 2, 1, 9, 44, 6, 18, 7, 67] | 0 | 8 | true | 3 |  |  |  |
| [-56, 23, 1, 2, 9, 44, 6, 18, 7, 67] |  |  |  | 3 | 2 |  | 1 |
| [-56, 23, 1, 2, 9, 44, 6, 18, 7, 67] | 0 | 8 | true | 2 |  |  |  |
| [-56, 1, 23, 2, 9, 44, 6, 18, 7, 67] |  |  |  | 2 | 1 |  | 1 |
| [-56, 1, 23, 2, 9, 44, 6, 18, 7, 67] | 0 | 8 | true | 1 |  |  |  |
| [-56, 1, 23, 2, 9, 44, 6, 18, 7, 67] | 1 | 8 | false | 1 |  |  |  |
| [-56, 1, 23, 2, 9, 44, 6, 18, 7, 67] | 1 | 8 | false | 2 |  |  |  |
| [-56, 1, 2, 23, 9, 44, 6, 18, 7, 67] |  |  |  | 2 | 3 |  | 23 |
| [-56, 1, 2, 23, 9, 44, 6, 18, 7, 67] | 1 | 8 | true | 3 |  |  |  |
| [-56, 1, 2, 9, 23, 44, 6, 18, 7, 67] |  |  |  | 3 | 2 |  | 23 |
| [-56, 1, 2, 9, 23, 44, 6, 18, 7, 67] | 1 | 8 | true | 4 |  |  |  |
| [-56, 1, 2, 9, 23, 44, 6, 18, 7, 67] | 1 | 8 | true | 5 |  |  |  |
| [-56, 1, 2, 9, 23, 6, 44, 18, 7, 67] |  |  |  | 5 | 6 |  | 44 |
| [-56, 1, 2, 9, 23, 6, 44, 18, 7, 67] | 1 | 8 | true | 6 |  |  |  |
| [-56, 1, 2, 9, 23, 6, 18, 44, 7, 67] |  |  |  | 6 | 7 |  | 44 |
| [-56, 1, 2, 9, 23, 6, 18, 44, 7, 67] | 1 | 8 | true | 7 |  |  |  |
| [-56, 1, 2, 9, 23, 6, 18, 7, 44, 67] |  |  |  | 7 | 8 |  | 44 |
| [-56, 1, 2, 9, 23, 6, 18, 7, 44, 67] | 1 | 7 | true | 7 |  |  |  |
| [-56, 1, 2, 9, 23, 6, 7, 18, 44, 67] |  |  |  | 7 | 6 |  | 7 |
| [-56, 1, 2, 9, 23, 6, 7, 18, 44, 67] | 1 | 7 | true | 6 |  |  |  |
| [-56, 1, 2, 9, 23, 6, 7, 18, 44, 67] | 1 | 7 | true | 5 |  |  |  |
| [-56, 1, 2, 9, 6, 23, 7, 18, 44, 67] |  |  |  | 5 | 4 |  | 6 |
| [-56, 1, 2, 9, 6, 23, 7, 18, 44, 67] | 1 | 7 | true | 4 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] |  |  |  | 4 | 3 |  | 6 |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 1 | 7 | true | 4 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 1 | 7 | true | 3 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 1 | 7 | true | 2 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 2 | 7 | false |  |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 2 | 7 | false | 2 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 2 | 7 | false | 3 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 2 | 7 | false | 4 |  |  |  |
| [-56, 1, 2, 6, 9, 23, 7, 18, 44, 67] | 2 | 7 | false | 5 |  |  |  |
| [-56, 1, 2, 6, 9, 7, 23, 18, 44, 67] |  |  |  | 5 | 6 |  | 23 |
| [-56, 1, 2, 6, 9, 7, 23, 18, 44, 67] | 2 | 7 | true | 6 |  |  |  |
| [-56, 1, 2, 6, 9, 7, 18, 23, 44, 67] |  |  |  | 6 | 7 |  | 23 |
| [-56, 1, 2, 6, 9, 7, 18, 23, 44, 67] | 2 | 7 | true | 6 |  |  |  |
| [-56, 1, 2, 6, 9, 7, 18, 23, 44, 67] | 2 | 6 | true |  |  |  |  |
| [-56, 1, 2, 6, 9, 7, 18, 23, 44, 67] | 2 | 6 | true | 6 |  |  |  |
| [-56, 1, 2, 6, 9, 7, 18, 23, 44, 67] | 2 | 6 | true | 5 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |  |  | 5 | 4 |  | 7 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 2 | 6 | true | 5 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 2 | 6 | true | 4 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 2 | 6 | true | 3 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 6 | false |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 6 | false | 3 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 6 | false | 4 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 6 | false | 5 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 5 | false |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 5 | false | 5 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 3 | 5 | false | 4 |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 4 | 5 | false |  |  |  |  |

Metodo de ordenamiento binario

Lista = [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Lista | i | key | left | right | Mid | j |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 1 | -56 | 0 | 0 | 0 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 1 | -56 | 0 | -1 |  | 0 |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 1 | -56 | 0 | -1 |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 1 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 | 67 | 0 | 1 | 0 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 | 67 | 1 | 1 | 1 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 | 67 | 2 | 1 |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 2 | 0 | 2 | 1 |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 2 | 0 | 0 | 0 |  |
| [-56, 23, 2, 67, 9, 44, 6, 18, 1, 7] | 3 | 2 | 1 | 0 |  | 2 |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 3 | 2 | 1 | 0 |  | 1 |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 3 |  |  |  |  |  |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 4 | 9 | 0 | 3 | 1 |  |
| [-56, 2, 23, 67, 9, 44, 6, 18, 1, 7] | 4 | 9 | 2 | 3 | 2 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 4 | 9 | 2 | 1 |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 4 |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 0 | 4 | 2 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 3 | 4 |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 3 | 4 | 3 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 4 | 4 |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 4 | 4 | 4 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 4 | 3 | 4 |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 44 | 4 | 3 |  |  |
| [-56, 2, 9, 23, 67, 67, 6, 18, 1, 7] | 5 | 44 | 4 | 3 |  | 4 |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 5 |  |  |  |  |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 0 | 5 | 2 |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 0 | 1 | 2 |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 0 | 1 |  |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 0 | 1 | 0 |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 1 | 1 |  |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 1 | 1 | 1 |  |
| [-56, 2, 9, 23, 44, 67, 6, 18, 1, 7] | 6 | 6 | 2 | 1 |  |  |
| [-56, 2, 9, 23, 44, 67, 67, 18, 1, 7] | 6 | 6 | 2 | 1 |  | 5 |
| [-56, 2, 9, 23, 44, 44, 67, 18, 1, 7] | 6 | 6 | 2 | 1 |  | 4 |
| [-56, 2, 9, 23, 23, 44, 67, 18, 1, 7] | 6 | 6 | 2 | 1 |  | 3 |
| [-56, 2, 9, 9, 23, 44, 67, 18, 1, 7] | 6 | 6 | 2 | 1 |  | 2 |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 6 | 6 | 2 | 1 |  |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 6 |  |  |  |  |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 0 | 6 | 3 |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 6 |  |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 6 | 5 |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 4 | 5 |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 4 |  |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 4 | 4 |  |
| [-56, 2, 6, 9, 23, 44, 67, 18, 1, 7] | 7 | 18 | 4 | 3 | 4 |  |
| [-56, 2, 6, 9, 23, 44, 67, 67, 1, 7] | 7 | 18 | 4 | 3 |  | 6 |
| [-56, 2, 6, 9, 23, 44, 44, 67, 1, 7] | 7 | 18 | 4 | 3 |  | 5 |
| [-56, 2, 6, 9, 23, 23, 44, 67, 1, 7] | 7 | 18 | 4 | 3 |  | 4 |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 7 | 18 | 4 | 3 |  |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 7 |  |  |  |  |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 7 | 3 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 2 | 3 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 2 |  |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 2 | 1 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 0 | 1 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 0 | 0 | 0 |  |
| [-56, 2, 6, 9, 18, 23, 44, 67, 1, 7] | 8 | 1 | 1 | 0 | 0 | 7 |
| [-56, 2, 6, 9, 18, 23, 44, 67, 67, 7] | 8 | 1 | 1 | 0 | 0 | 7 |
| [-56, 2, 6, 9, 18, 23, 44, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 6 |
| [-56, 2, 6, 9, 18, 23, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 5 |
| [-56, 2, 6, 9, 18, 18, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 4 |
| [-56, 2, 6, 9, 9, 18, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 3 |
| [-56, 2, 6, 6, 9, 18, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 2 |
| [-56, 2, 2, 6, 9, 18, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 | 1 |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 8 | 1 | 1 | 0 | 0 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 8 |  |  |  |  |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 9 | 7 | 0 | 8 | 4 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 9 | 7 | 0 | 3 | 4 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 9 | 7 | 0 | 3 | 1 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 9 | 7 | 0 | 2 | 2 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 7] | 9 | 7 | 3 | 3 | 3 |  |
| [-56, 1, 2, 6, 9, 18, 23, 44, 67, 67] | 9 | 7 | 4 | 3 |  | 8 |
| [-56, 1, 2, 6, 9, 18, 23, 44, 44, 67] | 9 | 7 | 4 | 3 |  | 7 |
| [-56, 1, 2, 6, 9, 18, 23, 23, 44, 67] | 9 | 7 | 4 | 3 |  | 6 |
| [-56, 1, 2, 6, 9, 18, 18, 23, 44, 67] | 9 | 7 | 4 | 3 |  | 5 |
| [-56, 1, 2, 6, 9, 9, 18, 23, 44, 67] | 9 | 7 | 4 | 3 |  | 4 |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 9 | 7 | 4 | 3 |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 9 |  |  |  |  |  |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] |  |  |  |  |  |  |

Método de ordenamiento externo por mezcla directa

Lista= [23, -56, 67, 2, 9, 44, 6, 18, 1, 7]

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lista | left | right | mid | i | j | k | N1 | N2 | LeftArr | RightArr |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 9 |  |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 0 |  |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 1 | 1 |  |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  |  |  |  |  |  |  |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 |  |  | 1 | 1 | [0] | [0] |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 |  |  | 1 | 1 | [23] | [0] |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 |  | 0 |  | 1 | 1 | [23] | [-56] |
| [23, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | [23] | [-56] |
| [-56, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | [23] | [-56] |
| [-56, -56, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | [23] | [-56] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | [23] | [-56] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | [23] | [-56] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 2 | 2 |  |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  | 2 | 1 | [0, 0] | [0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 0 |  |  | 2 | 1 | [-56, 0] | [0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 1 |  |  | 2 | 1 | [-56, 23] | [0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  | 0 |  | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 |  |  |  | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 0 | 0 | 0 | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 1 | 0 | 1 | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 0 | 2 | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 | 1 | 2 | 1 | 3 | 2 | 1 | [-56, 23] | [67] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 2 |  |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 3 |  |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 4 | 4 |  |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  |  |  | 1 | 1 | [0] | [0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 0 |  |  | 1 | 1 | [2] | [0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 |  | 0 |  | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 0 | 0 | 3 | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 1 | 0 | 3 | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 1 | 0 | 4 | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 1 | 1 | 4 | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 | 3 | 1 | 1 | 5 | 1 | 1 | [2] | [9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 3 | 4 |  |  |  |  |  |  |  |  |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 0 |  |  | 3 | 2 | [0, 0, 0] | [0, 0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 0 |  |  | 3 | 2 | [-56, 0, 0] | [0, 0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 |  |  | 3 | 2 | [-56, 23, 0] | [0, 0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 2 |  |  | 3 | 2 | [-56, 23, 67] | [0, 0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  | 0 |  | 3 | 2 | [-56, 23, 67] | [2, 0] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 |  | 1 |  | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 23, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 0 | 0 | 0 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 67, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 0 | 1 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 9, 2, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 1 | 2 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 9, 23, 9, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 1 | 2 | 3 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 2 | 2 | 4 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 4 | 2 | 3 | 2 | 5 | 3 | 2 | [-56, 23, 67] | [2, 9] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 4 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 0 | 9 | 4 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 9 | 7 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 7 | 6 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 5 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 6 | 6 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  |  |  | 1 | 1 | [0] | [0] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 | 0 |  |  | 1 | 1 | [44] | [0] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 |  | 0 |  | 1 | 1 | [44] | [6] |
| [-56, 2, 9, 23, 67, 44, 6, 18, 1, 7] | 5 | 6 | 5 | 0 | 0 | 5 | 1 | 1 | [44] | [6] |
| [-56, 2, 9, 23, 67, 6, 6, 18, 1, 7] | 5 | 6 | 5 | 0 | 0 | 5 | 1 | 1 | [44] | [6] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 6 | 5 | 0 | 1 | 6 | 1 | 1 | [44] | [6] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 6 | 5 | 1 | 1 | 7 | 1 | 1 | [44] | [6] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 6 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 7 | 7 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  |  |  | 2 | 1 |  |  |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  |  |  | 2 | 1 | [0, 0] | [0] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 0 |  |  | 2 | 1 | [6, 0] | [0] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 1 |  |  | 2 | 1 | [6, 44] | [0] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 |  | 0 |  | 2 | 1 | [6, 44] | [18] |
| [-56, 2, 9, 23, 67, 6, 44, 18, 1, 7] | 5 | 7 | 6 | 0 | 0 | 5 | 2 | 1 | [6, 44] | [18] |
| [-56, 2, 9, 23, 67, 6, 18, 18, 1, 7] | 5 | 7 | 6 | 1 | 0 | 6 | 2 | 1 | [6, 44] | [18] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 7 | 6 | 1 | 1 | 7 | 2 | 1 | [6, 44] | [18] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 7 | 6 | 2 | 1 | 8 | 2 | 1 | [6, 44] | [18] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 7 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 8 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 9 | 9 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  | 1 | 1 |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  |  |  | 1 | 1 | [0] | [0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 0 |  |  | 1 | 1 | [1] | [0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 |  | 0 |  | 1 | 1 | [1] | [7] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 0 | 0 | 8 | 1 | 1 | [1] | [7] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 1 | 1 | 9 | 1 | 1 | [1] | [7] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 | 8 | 1 | 1 | 10 | 1 | 1 | [1] | [7] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 8 | 9 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  |  |  | 3 | 2 | [0, 0, 0] | [0, 0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 0 |  |  | 3 | 2 | [6, 0, 0] | [0, 0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 1 |  |  | 3 | 2 | [6, 18, 0] | [0, 0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 2 |  |  | 3 | 2 | [6, 18, 44] | [0, 0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  | 0 |  | 3 | 2 | [6, 18, 44] | [1, 0] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 |  | 1 |  | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 6, 18, 44, 1, 7] | 5 | 9 | 7 | 0 | 0 | 5 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 18, 44, 1, 7] | 5 | 9 | 7 | 0 | 0 | 5 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 44, 1, 7] | 5 | 9 | 7 | 0 | 1 | 6 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 1, 7] | 5 | 9 | 7 | 1 | 1 | 7 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 7] | 5 | 9 | 7 | 1 | 2 | 8 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 5 | 9 | 7 | 2 | 2 | 9 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 5 | 9 | 7 | 3 | 2 | 10 | 3 | 2 | [6, 18, 44] | [1, 7] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 5 | 9 |  |  |  |  |  |  |  |  |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  |  |  | 5 | 5 | [0, 0, 0, 0, 0] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 0 |  |  | 5 | 5 | [-56, 0, 0, 0, 0] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 1 |  |  | 5 | 5 | [-56, 2, 0, 0, 0] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 |  |  | 5 | 5 | [-56, 2, 9, 0, 0] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 3 |  |  | 5 | 5 | [-56, 2, 9, 23, 0] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 4 |  |  | 5 | 5 | [-56, 2, 9, 23, 67] | [0, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  | 0 |  | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 0, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  | 1 |  | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 0, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  | 2 |  | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 0, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  | 3 |  | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 0] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 |  | 4 |  | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 2, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 0 | 0 | 0 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 9, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 1 | 0 | 1 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 23, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 1 | 1 | 2 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 67, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 1 | 3 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 1, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 2 | 4 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 6, 7, 18, 44] | 0 | 9 | 4 | 2 | 3 | 5 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 7, 18, 44] | 0 | 9 | 4 | 3 | 3 | 6 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 23, 18, 44] | 0 | 9 | 4 | 3 | 4 | 7 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 44] | 0 | 9 | 4 | 4 | 4 | 8 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 | 9 | 4 | 4 | 5 | 9 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 | 9 | 4 | 5 | 5 | 10 | 5 | 5 | [-56, 2, 9, 23, 67] | [1, 6, 7, 18, 44] |
| [-56, 1, 2, 6, 7, 9, 18, 23, 44, 67] | 0 | 9 |  |  |  |  |  |  |  |  |