Heap Sort

A good YouTube animation: <https://www.youtube.com/watch?v=MtQL_ll5KhQ>

Here is another: <https://www.youtube.com/watch?v=2DmK_H7IdTo>

Here is a good tutorial on heap sort: <https://www.geeksforgeeks.org/cpp-program-for-heap-sort/>

Heap sort is a comparison-based sorting technique based on Binary Heap data structure. It is like selection sort where we first find the maximum element and place the maximum element at the end. We repeat the same process for remaining element.

The Heap by array index:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | 0 |  |  |  |  |  |  |  |
|  |  |  | 1 |  |  |  |  |  |  |  | 2 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 |  |  |  | 4 |  |  |  | 5 |  |  |  | 6 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 |  | 8 |  | 9 |  | 10 |  | 11 |  | 12 |  | 13 |  | 14 |

The Heap by value:

0 YK

1 UP

2 VL

3 GQ

4 RN

5 TW

6 FH

7 BM

8 GH

9 GP

10 FL

11 BU

12 KF

13 DH

14 DD

The Heap as a graphic:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | YK |  |  |  |  |  |  |  |
|  |  |  | UP |  |  |  |  |  |  |  | VL |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | GQ |  |  |  | RN |  |  |  | TW |  |  |  | FH |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BM |  | GH |  | GP |  | FL |  | BU |  | KF |  | DH |  | DD |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  | 0 |  |  |  |  |  |  |  |
|  |  |  | 1 |  |  |  |  |  |  |  | 2 |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 |  |  |  | 4 |  |  |  | 5 |  |  |  | 6 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 |  | 8 |  | 9 |  | 10 |  | 11 |  | 12 |  | 13 |  | 14 |

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