Tournament Sort

DEFINITION

Tournament is a sorting algorithm it improves upon the naive selection sort by using a priority Queue to find the next element in the sort. In the native selection sort, it takes O(n) operation to select the next element of “n” elements. In a tournament sort it takes O(logn) operations.

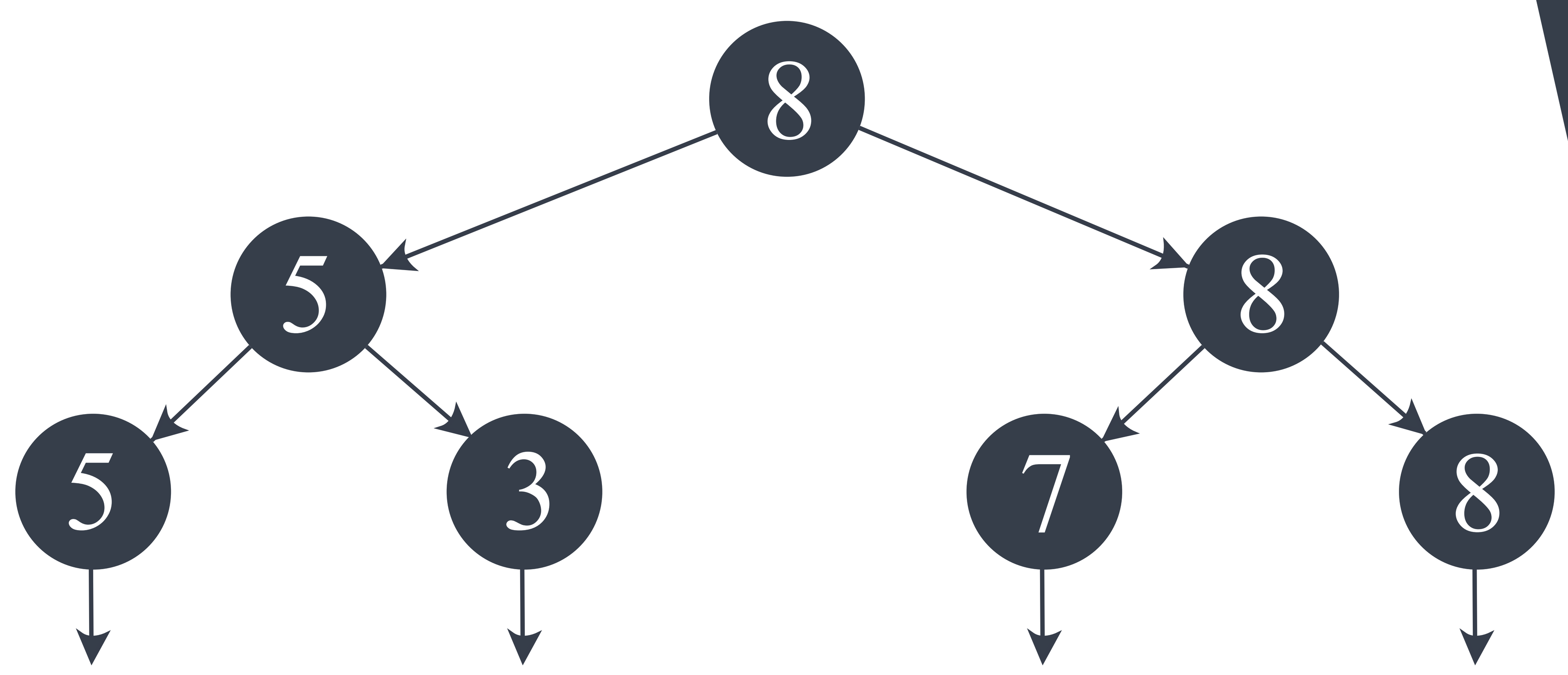
CLASS

Sorting Algorithm.

DATA STRUCTURE

Array.

TIME COMPLEXITY		
Best Case	Average Case	Worst Case
O(log n)	O(log n)	O(log n)



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PSEUDOCODE

Tournament Sorting

```
(a1 ,a2…. an :list of elements with n >= 1 )
 We are going to build a binary tree of height
  K=[logn].
   The first n leaves are assigned to be the n elements in the given
    list,while the remaining leaves are assigned to be -∞.
     K= [log n]
      T:Complete binary tree
       for i:=1 to n
               Set the value of the ith the leaf in T as ai
        for i:=n+1 to 2k
               Set the value of the ith leaf in T as -∞.
         for i:=1 to k
               for every vertex V at level k-i
               The value of v in T is the largest value of its two children.
           for i:=1 to n
              Ci=value of the root of T
               V:value of the root of T
                Change a value of a leaf with value v to -∞.
               while value of the root is v
                  V=parent(v)
                   The value of the vertex V in T is set to the largest value
                    of its two children.
                  List of values Cn,Cn-1,….,C2,C1
                   (list of integers sorted in nondecreasing order)
                      return Cn,Cn-1,….,C2,C1
```

Result

```
(a1, a2 ,….an: list of elements with n >1)
K: = [log n]
T: =complete binary tree
for i: =1 to n
   Set the value of the ith leaf in T as ai
for i: =n + 1 to 2k
     Set the value of the ith leaf in T as -∞
 for i: =1 to k
     for every vertex v at level k – i
      The value of v in T is the largest value of its
       two children
   for i: =1 to n
       c: = value of the root of T
        v: = value of the root of T
         Change a value of a leaf with value v to -∞
       while value of the root is v
           v:=parent(r)
         The value of vertex v in T is set to the
          largest value of its two children
            return cn,cn-1,…,c2,c1
```