
**
** 1999 chn2 - stool.cl.cam.ac.uk - Feb 16 11:50 - dsa3 PSq1
** P1291

3 Describe, in detail, how the heap sort algorithm works. [10]

MR

Show that the worst case cost of heapsort is $O(n \log n)$. [6]

Would it be possible to implement a variant of heapsort based on a perfectly balanced ternary structure in which the children of node i are at positions $3i-1$, $3i$, and $3i+1$, and if so what would be the advantages and disadvantages of the new method. [4]

Answer:
Bookwork -- needs a description of heapify and downheap, and the overall mechanism.
Need to show the initial heapify is $O(n)$ and the final phase is $O(n \log n)$.

Last part is yes. More comparisons at each level but the depth of the tree is reduced. Needs division by 3. Better used of on cache stores.