1999 Paper 12 Question 1

Data Structures and Algorithms

Describe, in detail, how the heapsort algorithm works. [10 marks]

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

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 marks]