



⇒ complete binary tree

one important observation is that the left child of a node occurs after the right of the previous node in the sequential representation [or two places after the left child].

Hence, position (left child of i) = $2 + \text{position}(\text{left child of } i-1)$

If we denote position by p , $p(i \rightarrow \text{left}) = 2 + p(i-1 \rightarrow \text{left})$

on iteration: $p(i \rightarrow \text{left}) = 2 + p(i-1 \rightarrow \text{left})$

$$p(i-1 \rightarrow \text{left}) = 2 + p(i-2 \rightarrow \text{left})$$

⋮

$$p(\text{root} \rightarrow \text{left}) = 2$$

$$\therefore p(i \rightarrow \text{left}) = 2^i$$

Hence left child occurs at 2^i if node is at i .

Similarly, right child occurs at $2^i + 1$.

of course, $\lfloor \frac{2^i}{2} \rfloor = \lfloor \frac{2^i + 1}{2} \rfloor = i$, so parent of a node occurs

at $\lfloor \frac{p}{2} \rfloor$, if p is position of that node.