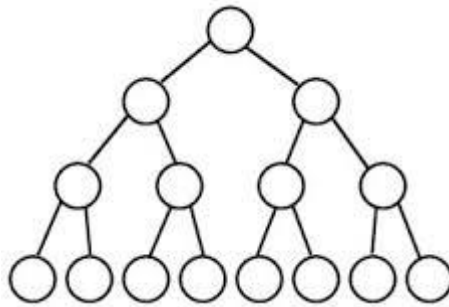# Challenge 1 – Proof by Induction

Prove by induction that the number of levels of a perfect binary tree[1] is $\log_2(n+1)$, where n is the number of nodes of the tree.

Figure 1. Example of a perfect binary tree (this one with 15 nodes and with 4 levels).

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[1] Assume that in a perfect binary tree all the internal nodes (i.e., all the nodes except the leaves) of the tree have two children (all the leaves are at the same level).