

# ***Recurrence – tree Method***

***The recurrence – tree method is another way of solving a recurrence equation by expanding its terms in a tree – like manner.***

***It is almost similar to the substitution method, but is a visual method. It is used for obtaining the asymptotic bounds.***

***The steps involved in solving a recurrence equation using the recurrence – tree method are as follows:***

***1. Formulate the recurrence equation by visualizing the calls as a tree.***

***2. Collect the following information from the recurrence tree:***

***a) Level: Determine the level of the generated tree.***

***The level of a node is the length of the path from the root to the node. The level of a root is 0.***

***The level of a tree indicates the number of subproblems and amount of work done at every level.***

***b) Cost per level: Cost per level has to be calculated for every level of the generated tree using the level count and the amount of work done by the subproblems.***

***c) Total Cost: It is the sum of the cost of all levels.***

***3. Express the complexity in terms of the total cost.***

***4. Verify the summation using the method of substitution or some other method if necessary.***

\*\*\*\*\*