

Tree Method

$$T(n) = aT\left(\frac{n}{b}\right) + O(n^d)$$

1. What is F (the number of levels of recursion), in terms of a, b, d, n ?
 - Options: $O(\log_b n)$, $O(\log_d n)$, $O(n^{\log_b d})$, $O(b^{\log_d n})$
2. What is the total # of operations done just at level k ?
 - a. How many recursive calls at level k ?
 - b. What is the subproblem size at level k ?
 - c. What is the work done in each box at level k ?

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1. What is F (the number of levels of recursion), in terms of a, b, d, n ? $O(\log_b n)$
2. What is the total # of operations done at level k ?
 - a. How many recursive calls at level k ? a^k
 - b. What is the subproblem size at level k ? n/b^k
 - c. What work done in each box at level k ? $\left(\frac{n}{b^k}\right)^d$
 - d. Total: $a^k \left(\frac{n}{b^k}\right)^d$

Probability Trees

You are spelunking and come across a strange series of caverns. In the first room, there are three passages, one of which exits the cave, and the other two lead to new caverns. Each of those caverns have another 3 passages, one of which exits the cave, and the other two lead to new caverns....etc. Consider choosing each passage with equal probability

- Tree to create sample space
- Probability of exiting immediately, or visiting at least 5 rooms?