Spring 2022 Lecture 4

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$T(n) = T(?) + C$

$h_r + 1$

h_r

$?$ $?$

$2^{h_r+1} - 1$ $2^{h_r} - 1$

$T(n) \le T(\frac{2}{3}n) + C$

$a = 1$

$b = \frac{3}{2}$

$S_L + \frac{S_L}{2} = n$

$S_L = \frac{2}{3}n$

$n^{\log_b a} = 1$

$$2 \times \sum_{k=1}^{\infty} \frac{k}{2^k} = S \times 2$$

$$\sum_{k=1}^{\infty} \left(\frac{k-1}{2^{k-1}} + \frac{1}{2^{k-1}} \right) = 2S$$

$k' = k-1$

$$\sum_{k'=0}^{\infty} \frac{k'}{2^k} + \sum_{k=1}^{\infty} \frac{1}{2^{k-1}} = 2S$$

S

$1 + \frac{1}{2} + \frac{1}{4} + \cdots$

$S + 2 = 2S$

$S = 2$