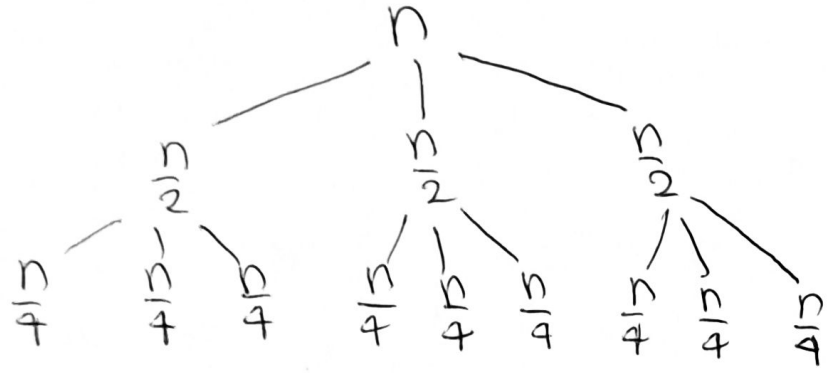
$T(n) = 3T(n/2) + O(n)$



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

$= 3^2 \cdot \frac{n}{2^2}$

Height: $\frac{n}{2^i} = 1 \Rightarrow \log_2 n$

Sum of i-level: $3^i \frac{n}{2^i}$

Time complexity: $\sum_{i=0}^{i=\log_2 n} 3^i \frac{n}{2^i}$

$= n \sum_{i=0}^{i=\log_2 n} \left(\frac{3}{2}\right)^i$

$= n \cdot n^{\log_2^3}$

$= \Theta\left(n^{\log_2^3}\right)$

$T(n) = 3\,T(n/2) + O(n)$

$a = 3,\ b = 2,\ f(n) = n$

$n^{\log_b^a} = n^{\log_2^3}$

$n^{\log_2^3} > n$

Thus, $T(n) = \Theta(n^{\log_2^3})$