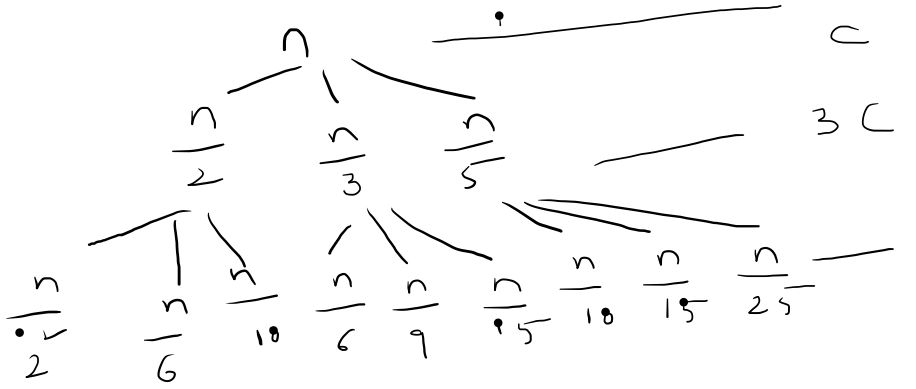
Assignment - 3 (Part - 2)

1) $T(n) = T\left(\frac{n}{2}\right) + T\left(\frac{n}{3}\right) + T\left(\frac{n}{5}\right) + c$



$\frac{n}{2^K} = 1$ $\quad \frac{n}{3^K} = 1$ $\quad \frac{n}{5^K} = 1$

$K = \log_2 n$ $\quad K = \log_3 n$ $\quad K = \log_5 n$

highest

$3^0 \cdot c + 3^1 \cdot c + 3^2 \cdot c + \cdots$

$c\left(3^0 + 3^1 + 3^2 + \cdots 3^K\right) \rightarrow$ G.P

$r = 3, \; a = 1$

$r = 3 > 1$ series

$\frac{a \cdot (r^n - 1)}{r - 1}$

$\frac{3^{\log_2 n} - 1}{3 - 1} = \frac{3^{\log_2 n} - 1}{2}$

$= \frac{n^{\log_2 3} - 1}{2} = \frac{n^{1.5} - 1}{2}$

$O(n^{1.5})$