Date:

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Master theorem

$T(N) = a\,T(n/b) + f(n)$

a = subpart we are working

b = Reduction size of tree.

F(n) = Time call tree. from top

$f(n) = (n^K \log^P n)\,\theta$

Find → (i) $\log_b^a$ (iii) P
(ii) K

case 1 : if $\log_b^a > K$, $\theta(n^{\log_b^a})$

case 2 : if $\log_b^a = K$, $P > -1$, $\theta(n^K \log^{P+1} n)$

$P = -1$, $\theta(n^K \log(\log n))$

$P < -1$, $\theta(n^K)$

case 3 : if $\log_b^a < K$,

$P \geq 0$, $\theta(n^K \log^P n)$

$P < 0$, $\theta(n^K)$

Exp → $T(N) = 4T(n/2) + n$

→ $a = 4$, $b = 2$, $f(n) = n = n^K \log^P n$

$K = 1$, $P = 0$

$\therefore \log_b^a = \log_2^4 = 2 > K$, $P = 0$.

$\theta = (\log n^{\log_b^a}) = \theta(n^2)$