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Section : BS Data Science
Course : AOA

Class Activity

Master Theorem Exp:

i) $T(n) = 3T(n/2) + 1$

$a = 3, \quad b = 2, \quad d = 0$

$a = b^d$

$3 = 2^0$

$T(n) = O(n^{\log_2 3})$

iii) $T(n) = 8T(n/2) + n^2$

$a = 8, \quad b = 2, \quad d = 2$

$a = b^d$

$8 = 2^2$

$8 > 4$

$T(n) = O(n^{\log_2 8})$

ii) $T(n) = 2T(n/4) + \sqrt{2}$

$a = 2, \quad b = 4, \quad d = 1/2$

$$a = b^d$$
$$2 = 4^{1/2}$$
$$2 = \sqrt{4}$$
$$2 = 2$$

$T(n) = O(n^{1/2} \log n)$

iv) $T(n) = 4T(n/2) + n^3$

$a = 4, \quad b = 2, \quad d = 3$

$$a = b^d$$
$$4 = 2^3$$
$$4 = 8$$
$$4 < 8$$

$T(n) = O(n^3)$

v) $T(n) = 3T(n/4) + n\log n$

$a = 3,\ b = 4,\ d = 1$

$\log_b a = \log_4 3 = 0.792$

$d\ (=1) > \log_4 3$

$T(n) = O(n \log n)$