

Apply masters theorem & obtain the solutions

1) $T(n) = 8T(n/2) + 1000n^2$

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

$8 > 2^2$

$a > b^d$

$T(n) \in O(n^{\log_b a})$

$T(n) \in O(n^{\log_2 8}) \in O(n^3)$

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

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

$2 < 2^2$

$a < b^d$

$T(n) \in O(n^d)$

$T(n) \in O(n^2)$

3) $T(n) = 2T(n/2) + 10n$

$a=2 \quad b=2 \quad d=1$

$2 = 2^1$

$a = b^d$

$T(n) \in O(n^d \log n)$

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