

***Divide And Conquer –
Simplified Master Theorem
–Example 1***

Solve the following recurrence using the generalized master theorem:

$$T(n) = 8T\left(\frac{n}{2}\right) + n^2$$

Solution:

This recurrence is of the form : $aT\left(\frac{n}{b}\right) + cn^k$.

Here $a = 8, b = 2, c = 1$ and $k = 2$.

Check for all conditions: $a = b^k, a > b^k$ and $a < b^k$.

As $a > b^k$ (i. e., $8 > 2^2$), $T(n) = \Theta(n^{\log_2 8}) = \Theta(n^3)$.

Therefore , the asymptotic complexity of this function is $\Theta(n^3)$.
