

Example of recursion tree

Solve
$$T(n) = T(n/4) + T(n/2) + n^2$$
:

$$(n/4)^{2} \qquad (n/2)^{2} \qquad \frac{5}{16}n^{2}$$

$$(n/16)^{2} \qquad (n/8)^{2} \qquad (n/8)^{2} \qquad (n/4)^{2} \qquad \frac{25}{256}n^{2}$$

$$\vdots \qquad \vdots \qquad \vdots$$

$$\Theta(1) \qquad \text{Total} = n^{2} \left(1 + \frac{5}{16} + \left(\frac{5}{16}\right)^{2} + \left(\frac{5}{16}\right)^{3} + \cdots\right)$$

$$= \Theta(n^{2}) \qquad \text{geometric series} \quad \blacksquare$$