$$T(n) = \begin{cases} 1, & n = 1 \\ 3\mathrm{T(n-1)} + (1/\mathrm{n}) & n > 1 \end{cases}$$

$$T(n) = 3\mathrm{T(n-1)} + \left(\frac{1}{\mathrm{n}}\right) \quad k = 1$$

$$T(n) = 3\left[3\mathrm{T(n-1-1)} + \left(\frac{1}{\mathrm{n-1}}\right)\right] + \left(\frac{1}{\mathrm{n}}\right) == 9\mathrm{T(n-2)} + 3\left(\frac{1}{\mathrm{n-1}}\right) + \left(\frac{1}{\mathrm{n}}\right) \quad k = 2$$

$$T(n) = 9\left[3\mathrm{T(n-2-1)} + \left(\frac{1}{\mathrm{n-2}}\right)\right] + 3\left(\frac{1}{\mathrm{n-1}}\right) + \left(\frac{1}{\mathrm{n}}\right) =$$

$$= 27\mathrm{T(n-3)} + 9\left(\frac{1}{\mathrm{n-2}}\right) + 3\left(\frac{1}{\mathrm{n-1}}\right) + \left(\frac{1}{\mathrm{n}}\right) \quad k = 3$$

$$T(n) = 27\left[3\mathrm{T(n-3-1)} + \left(\frac{1}{\mathrm{n-3}}\right)\right] + 9\left(\frac{1}{\mathrm{n-2}}\right) + 3\left(\frac{1}{\mathrm{n-1}}\right) + \left(\frac{1}{\mathrm{n}}\right) =$$

$$= 81\mathrm{T(n-4)} + 27\left(\frac{1}{\mathrm{n-3}}\right) + 9\left(\frac{1}{\mathrm{n-2}}\right) + 3\left(\frac{1}{\mathrm{n-1}}\right) + \left(\frac{1}{\mathrm{n}}\right) \quad k = 4$$

$$T(n) = 3^K \cdot T(n-k) + \sum_{i=0}^{k-1} 3^i \left(\frac{1}{n-i}\right)$$

$$como\ T(1) = 1 \quad => \ n - k = 1 \quad => \quad k = n - 1$$

$$T(n) = 3^{n-1} \cdot T(n-(n-1)) + \sum_{i=0}^{n-2} 3^i \left(\frac{1}{n-i}\right)$$

$$T(n) = 3^{n-1} + \sum_{i=0}^{n-2} 3^i \left(\frac{1}{n-i}\right)$$

$$\emptyset \ \in (3^n)$$