

$$T(n) = 2 + (n/2) + n, \quad T(1) = 1$$

$$\Rightarrow T(n) = 2 + (n/2) + n$$

$$\Rightarrow T(n) = 2(2 + (n/4) + n/2) + n = 4 + (n/2) + 2n$$

$$\Rightarrow T(n) = 4(2 + (n/8) + n/4) + 2n = 8 + (n/2) + 3n$$

$$2^k + (n/2^k) + km$$

$$\vdots \quad \vdots \quad \vdots$$

$$\frac{n}{2^k} = 1 \Rightarrow n = 2^k$$

$$\Rightarrow \log_2(n) = \log_2(2^k)$$

← recursion

$$T(n) = 2^{\log_2(n)} + T(n/2^k) + \log_2 n \cdot n$$

$$T(n) = n + n(\log_2(n))$$

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