2) $T(n) = T(\frac{n}{2}) + 1$

$T(\frac{n}{2}) = T(\frac{n}{2^2}) + 1 + 1$

$T(\frac{n}{2^2}) = T(\frac{n}{2^3}) + 1 + 1 + 1$

. . .

$T(\frac{n}{2^{k-1}}) = T(\frac{n}{2^k}) + k$

$\log(n) = (2^k)^{\frac{n}{2^k} = 1}$

$\log n = k$

$T(n) = 1 + \log(n)$

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