

$$n^n > n! > 2^n > n^d > n^3 > n^2 > n\sqrt{n} > n \log n > n > \sqrt{n} > \log n$$

$$T(n) = T(n/3) + n \log_3 n, \quad t_1 = 0$$

$$P(n^d) b^n (x-b)^{d+1}$$

$$T_k = c_1 \cdot r^k + c_2 \cdot r_2^k + c_3 \cdot k \cdot r_1^k$$

$$\sum_{i=1}^n i^2 = \frac{n \cdot (n+1) \cdot (2n+1)}{6}$$

$$\sum_{i=1}^n i^3 = \frac{n^2 (n+1)^2}{4}$$

$$\sum_{i=0}^n r^i = \frac{1-r^{n+1}}{1-r}$$

$$\text{for } (j=1, j \leq n; j *= 2) = \log_2 n + 1$$

Array Queue

front=0 rear=-1

rear+1=front, rear=-1

rear=(n-1)=front or
rear > n-1 full

Circular Queue

front=rear=-1 or n-1

front=(rear+1) % n

rear=(front-1) % n

length = number of edges on path

Depth = n_i = length from root = 0

Height = length to a leaf tree = root

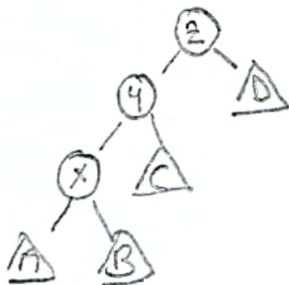
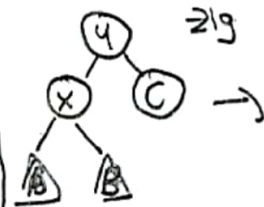
In Order = LNR

Pre Order = NLR

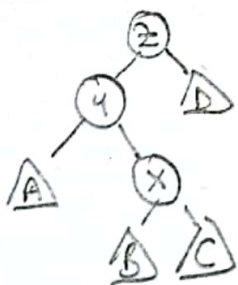
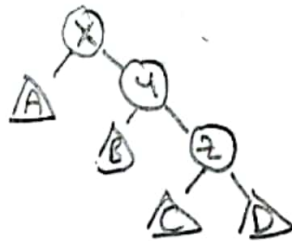
Post Order = LRN

$$T(n) = T(n-1) + 1 = O(n)$$

$$T(n) = T(n-1) + n = O(n^2)$$



zig-zag



zig-zag

