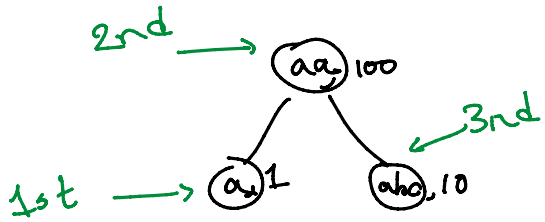
Class 04

Wednesday, September 15, 2021 8:52 PM

MAP



a 1
abc 10
aa 100

a aa abc

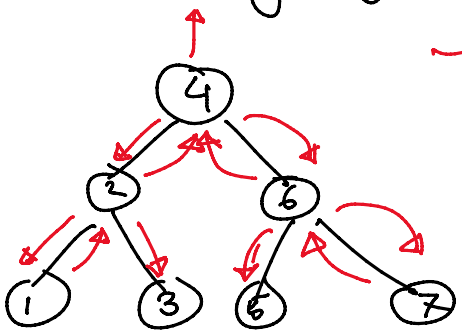
a 1
aa 100
abc 10

—o—

Graph Theory ?

Tree Graph ← Difference?

Tree Traversing Algorithm → DFS → InOrder DFS

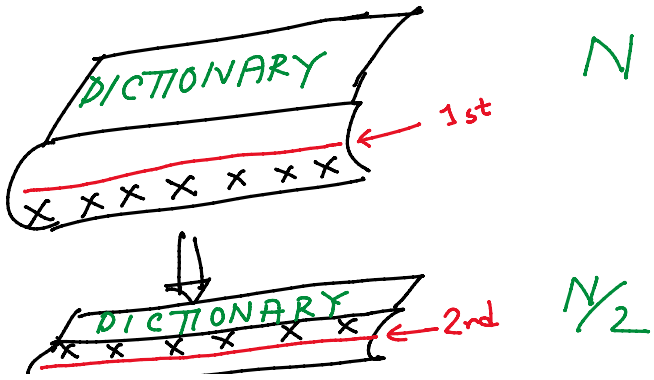


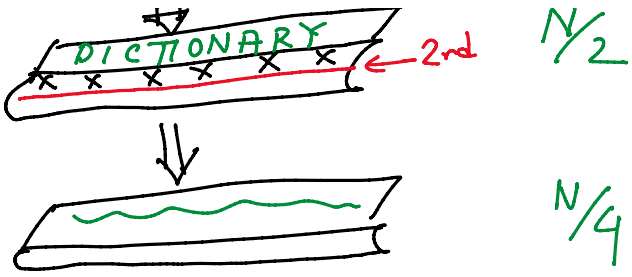
→ Left
Root → print
Right

1 2 3 4 5 6 7

—o—

Binary Search





$n = 9$ $\quad v = 220$

arr → {1, 5, 7, 8, 112, 135, 169, 220, 225}

6 7 8

$mid\_index = \frac{6+8}{2} = 7$

0-th → $N/1$ → $N/2^0$

1-st → $N/2$ → $N/2^1$

2-nd → $N/4$ → $N/2^2$

3rd → $N/8$ → $N/2^3$

K-th → $N/2^k \leq 1$

$pqv \rightarrow \frac{pqv}{2}$

$pqv \rightarrow pqv \times 2^{-1} \rightarrow pqv \times 2^{-1} \times 2^{-1}$

$\rightarrow pqv \times 2^{-2}$

$\rightarrow \frac{pqv}{2^2}$

$$\frac{N}{2^k} \leq 1$$

$$\Rightarrow N \leq 2^k$$

$$\Rightarrow \log_2 N \leq \log_2 2^k$$

$$\Rightarrow \log_2 N \leq k$$

$$\Rightarrow \log_2 N \leq K$$

$$\therefore K \geq \log_2 N$$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

1 2 2 3 2 4 2 4 3 4 2 6 2 4 4 5 2 6 2 6

DB (Divisors) $\simeq 10^{14}$

~~$\sqrt{20} \simeq 4$~~

1 2 3 5 7 11 13 17 19 4 9 6 8 10 14 15 16

1 2 2 2 2 2 2 2 2 3 3 4 4 4 4 4 5

12 18 20

6 6 6

BS → LOWERBOUND

BS → UPPERBOUND

① ② ~~③~~ ④

20 10 5

1 2 2 2 3 3 3 4

3 (UB)

$v = 25$

1 2 2 3 3 3 4 4 4 4 5 5 5 5 5

1 1 2 2 2 2 2 3 3 3 3 3 3