

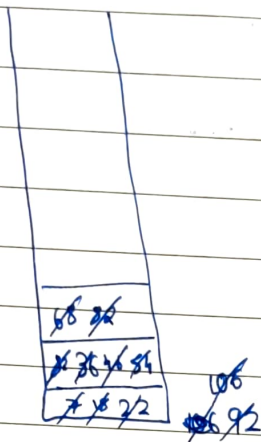
Rough Work

180020006

Dhruv Jain

1) Explanatory from slides.

2)



7 16 36 46 68 54 82

22 106 92

106
92

$$3) \quad 1 < \log \log n < \sqrt{\log n} < \log_2 n < 2^{\log n} < n < \log(n!) < n/\log n < n^2 \\ < 2^n < 4^n < n! < 2^{2^n}$$

$$n < n\sqrt{\log n} < n \log_2 n < n^2$$

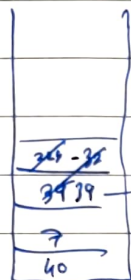
4)

i) j never becomes zero again $O(n)$ ii) j breaks everytime $O(n)$ iii) $j/2$ everytime $O(\log_2 n)$ iv) $k, k^2, \dots, 20$ $O(n^2 \log_2 n)$

5/

18	1	30	20	32	42	66
x	18	20	30	42	52	66
P ₁	P ₂	P ₁	P ₂	P ₁	P ₂	P ₁

6/



CS21 = 39

39, 7, 40

7/

$$\begin{array}{r} 1 \\ 8 \end{array} > \begin{array}{r} 1 \\ 8 \end{array} > 9 - 14$$

ii/

$$\begin{array}{r} 1 \\ 8 \end{array} > \begin{array}{r} 1 \\ 3 \end{array} > 2 - 6$$

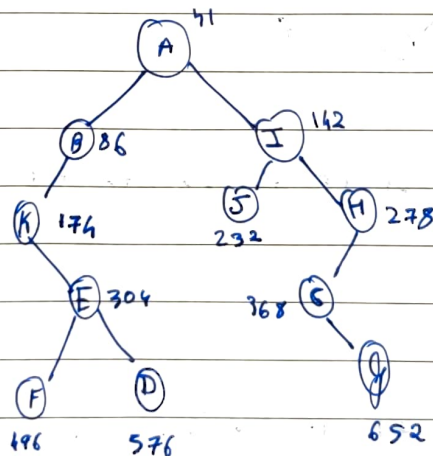
iii/

$$\begin{array}{r} 5 \\ 8 \end{array} > 40 - 41 \rightarrow 42$$

iv/

$$\begin{array}{r} 5 \\ 8 \end{array} > 40 - 41 \rightarrow 41$$

8/

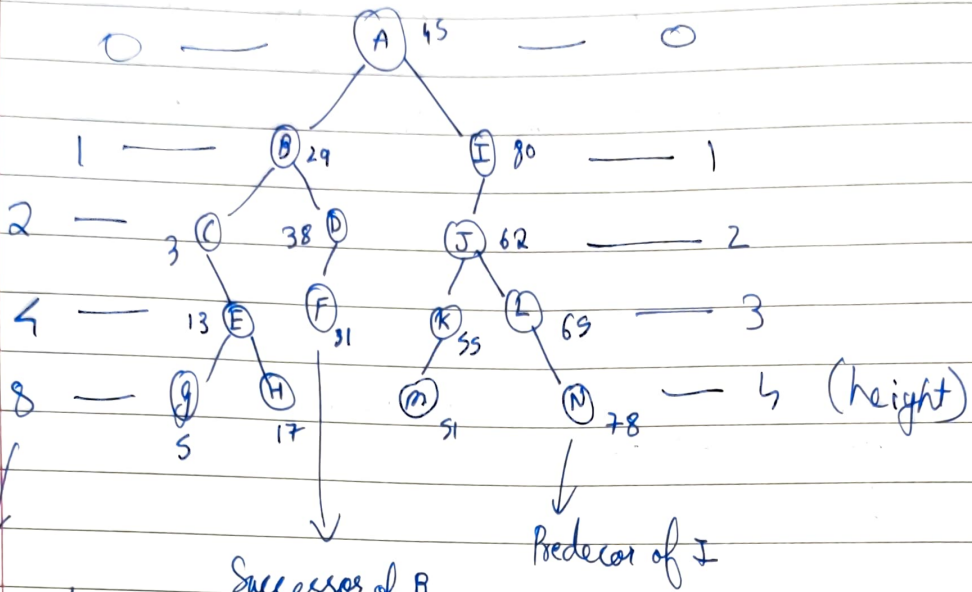


Pre 41 86 174 304 496 576 142 232 278 368 652

In 174 496 304 576 86 41 232 142 368 652 278

Post 496 576 304 174 86 232 652 368 278 142 41

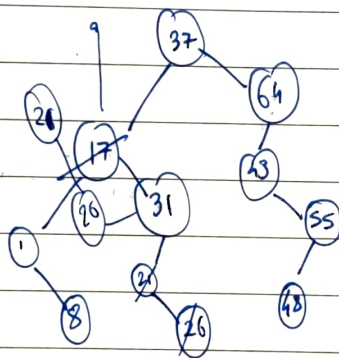
9)



15
null pointers

after deletion

10)



Post + 8 1 26 21 31 17 48 55 43 64 37

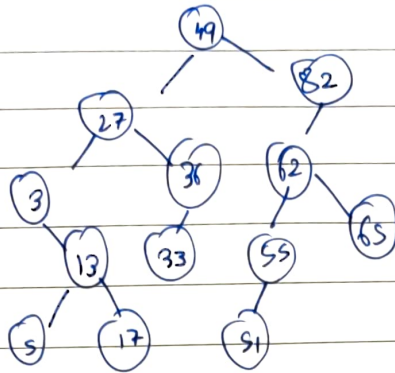
After deletion +

Post + 8 1 31 26 21 46 55 43 64 37

11)

$$2^N - 1$$

12)



Pre \hookleftarrow 49 27 3 13 5 17 36 33 82 62 55 51 65
 In \hookleftarrow 3 5 13 17 27 33 36 49 51 55 62 65 82

13)

Simple \hookleftarrow

$$2^n > n^2 > n \log n > n > \log n > 1$$

14)

Queue is used in merge sort while merging.

Thank You.



Pre \hookleftarrow RT, L, R

In \hookleftarrow L, RT, R

Post \hookleftarrow L, R, RT