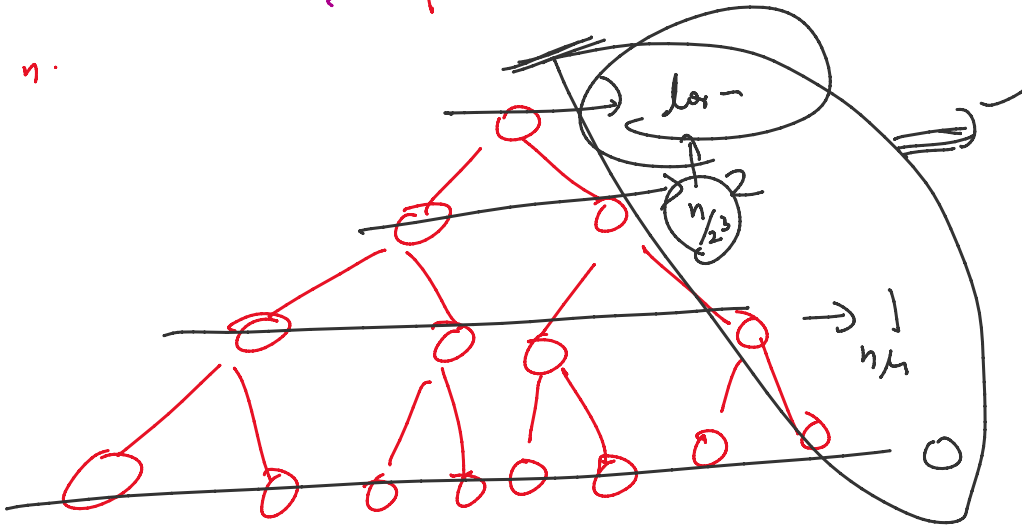


$\{50, 40, 30, 20, 10, 60, 5\}$

min Heap



$$\sum \left( 1 \cdot \log n + 2 \cdot (\log n - 1) + 3 \cdot (\log n - 2) + \dots \right) \rightarrow O(n)$$

$$\log n + 2 \log n + 3 \log n + \dots + n \log n$$

$$\left( \log n \cdot N \right) = N$$

$$N \log N - N$$

Recp

Hash Map

Key - nr

array  
Key

0 - (n-1)

Value

0 → 10

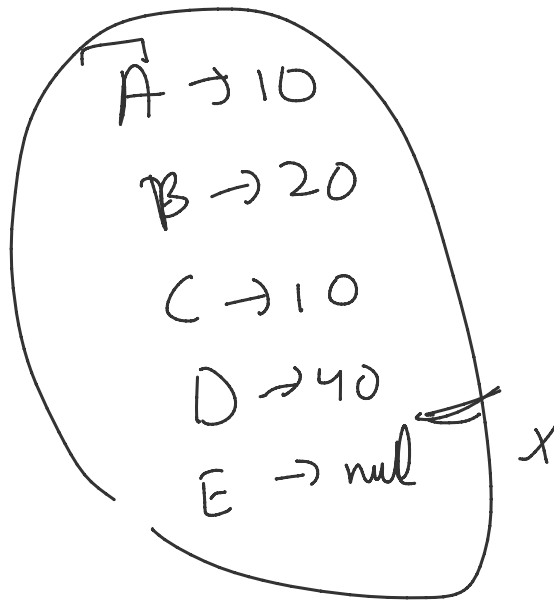
1 → 20

3 → 40

Hash

< Key, Value >





↓  
nums = [2, 7, 11, 15], target = 9  
n-1

HM < di >

2, 7  
↓ ↓  
0

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓  
int[] arr1 = { 30, 20, 40, 50, 70, 30, 20, 20, 50, 50 };  
int[] arr2 = { 50, 80, 30, 20, 20, 90, 50, 20 };  
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

50, ✓  
80, ✓  
30, ✓  
20, ✓  
90, ✓

sol1)  $(n \log n + n \log n)$

sol2)  $O(N + M)$

You are given an array of Integers in no particular order. Write a Program to find the longest possible sequence of consecutive numbers using the numbers from the array.

Target  $O(n)$  ✓

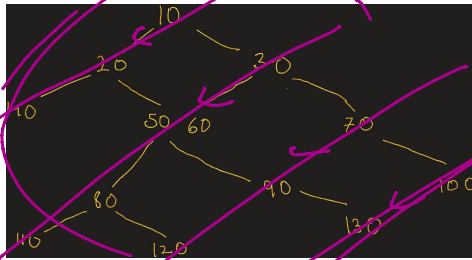
Input : [2, 12, 9, 16, 10, 5, 3, 20, 25, 11, 1, 8, 6]

Output : [8, 9, 10, 11, 12]

Input : [15, 13, 23, 21, 19, 11, 16]

Output : [15, 16]

20 25 }



40, 110  
20, 80  
10, 50, 60, 120  
30, 90  
70, 130  
100

$0 \rightarrow \{10, 50\}$   
 $\hookrightarrow 60$   
 $100$   
 $-2 \{40, 110\}$   
 $-1 \rightarrow 14$

$-1 \rightarrow AL$   
 $0 \rightarrow AL$   
 $1 \rightarrow AL$

$s =$  ~~C~~<sup>0</sup> ~~a~~<sup>3</sup> ~~b~~<sup>4</sup> ~~s~~<sup>5</sup> ~~t~~<sup>6</sup> and logs ~~t~~<sup>7</sup> ~~s~~<sup>8</sup> ~~a~~<sup>9</sup> ~~b~~<sup>10</sup> ~~t~~<sup>11</sup>

$t =$  ~~c~~<sup>1</sup> ~~a~~<sup>2</sup> ~~t~~<sup>3</sup> ~~a~~<sup>4</sup> ~~g~~<sup>5</sup> ~~e~~<sup>6</sup> ~~s~~<sup>7</sup>

$2$  ~~prev = 2~~ ~~1~~ ~~3~~

2  $puw = 2 \times 3 = 6$

t. lgs

## Graph

$C \rightarrow 0$   
 $a \rightarrow \{1, 4\}$   
 $t \rightarrow \{2, 11\}$   
 $S \rightarrow \{3, 10\}$   
 $n \rightarrow \{5\}$   
 $d \rightarrow \{6, 7\}$   
 $o \rightarrow \{8\}$   
 $g \rightarrow \{9\}$

$$\text{Load factor} = \frac{\text{no. of nodes}}{\text{total buckets}} = 2$$

D-10

A-10

B-20

$$\begin{array}{r} 69 \\ - 20 \\ \hline 49 \end{array}$$

(D-10)  
0

(A-10)  
1

(B-10)  
2

(C-20)  
3

13 % 4 = 1

avg Buckets = (L<sub>f</sub>) ~~A.L~~ Mod

