Plan

Friday, 1 October 2021 5:57 PM

Plan for Fri & Sunday

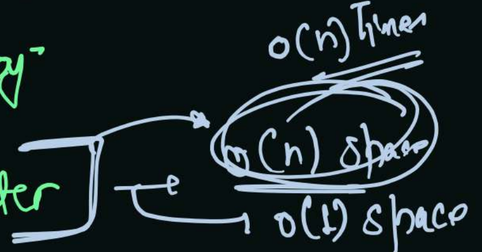
Friday--

1. Consecutive no. Sum
2. Add String
3. Multiply Strings

→ In array-LinkedList

DP:

4. Max Sum of two non overlapping Subarray-
5. Trapping rain water



6. Sliding window Max → In Stack

Sunday-

1. Meeting Room
2. Meeting Room 2
3. Merge Intervals
4. Interval List Intersection
5. Insert Intervals
6. Car fleet

Gandhi Jayanti on 2nd October

Consecutive Number Sum

Friday, 1 October 2021 6:38 PM

Number = 15.

15 = 5

Max count of consecutive no. is → 5

i.e. [1, 2, 3, 4, & 5]

① 15 ⟶ 15

② 7+8 ⟶ 15

③ 4+5+6 ⟶ 15

④ 1+2+3+4+5 ⟶ 15

No. of ways = 4 Ans

Pick k Numbers →

k=1 ⟶ True

k=2 ⟶ True

3 ⟶ True

4 ⟶ False

5 ⟶ True

⋮

Kmax

15

7+8

4+5+6

1+2+3+4+5

conclusion

① How to figure out Kmax?

② How to know, if it is possible to make sum Equal to target with selection of ki consecutive no.

4 No. of ways.

How to find Kmax →

Generic Example →

$$\underbrace{x + (x+1) + (x+2) + (x+3) + \cdots + [x+(k-1)]}_{K \text{ terms} \rightarrow \text{Suppose it is max}} = N$$

$$Kx + [0 + 1 + 2 + 3 + \cdots + (k-1)] = N$$

$$Kx + \frac{K(K-1)}{2} = N$$

$$\boxed{Kx = N - \frac{K(K-1)}{2}}$$

→ Equation of line

Linear Equation in two variables 'x' & 'K'

we can find coordinate $K = 1, 2, 3, \ldots K_{max}$

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

$$\sum n^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum n^3 = \left(\frac{n(n+1)}{2}\right)^2$$

↳ $$\sum (n-1) = \frac{n(n+1)}{2}$$

$$kx = N - \frac{k(k-1)}{2}$$

$$\Rightarrow \quad x = \frac{N}{k} - \left(\frac{k-1}{2}\right).$$

No. are +ve Integer.

$$\Rightarrow \quad x > 0 \qquad \text{[for +ve Integer]}$$

$$\Rightarrow \quad \frac{N}{k} - \left(\frac{k-1}{2}\right) > 0$$

$$\frac{N}{k} > \frac{k-1}{2}$$

$$\boxed{2N > k(k-1)}$$

Condition b/w N & K

↳ In terms of order $= O(\sqrt{N})$

for K, it is from $k=1$ to $\underline{2N > k(k-1)}$. K Increment by 1.

How to find if it is possible to make target sum with k-numbers.

$$kx = N - \frac{k(k+1)}{2}$$

$$\Rightarrow \quad x = \frac{2N - k(k+1)}{2k}$$

for 'x'

$k = 2$ put

↳ x is an integer

If 'x' must be an integer.

```
if ([2N - k(k+1)] % 2k == 0) {
    // x is an integer.
    Count ++
}
```

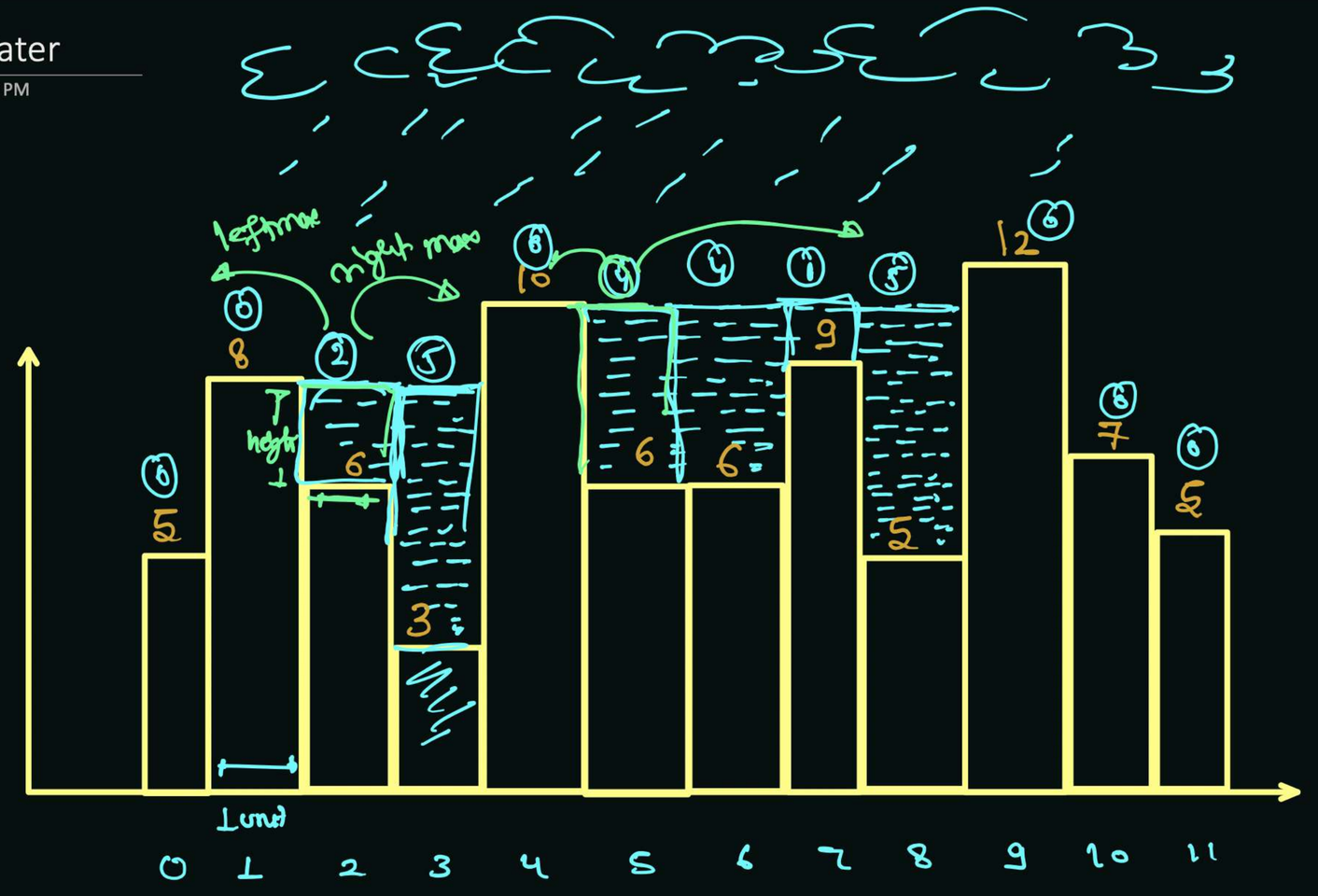
$N = 15$, $k = 2$

$$x = \frac{30 - 2}{4} = \frac{28}{4} = 7$$

$$x = \frac{30 - 12}{8} = \frac{18}{8}$$ = this is not an integer

Trapping Rain Water

Friday, 1 October 2021 9:17 PM



water is find in Area of area.

Total water = 21 unit

water height =

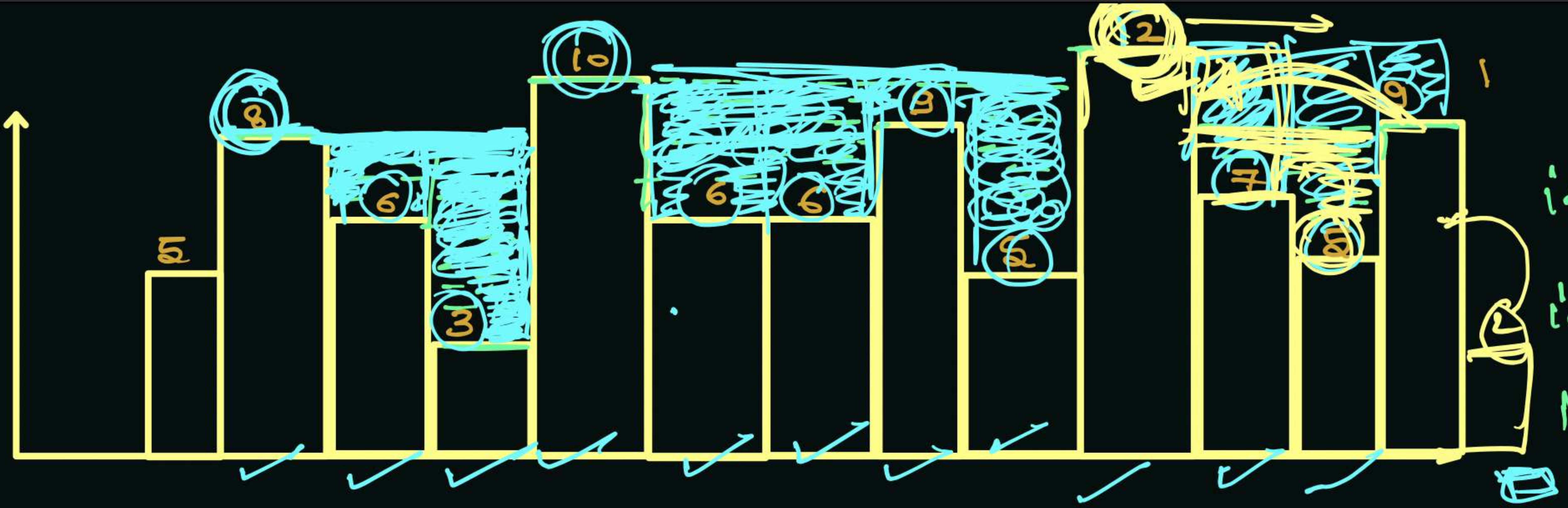
Min(leftmax[i], rightmax[i]) - ht[i]

ht →	5	8	6	3	10	6	6	9	5	12	7	6
leftmax →	5	8	8	8	10	10	10	10	10	12	12	12
rightmax →	12	12	12	12	12	12	12	12	12	12	7	6
water →	0	0	2	5	0	4	4	1	5	0	0	0

add → 21 unit

Space → O(n)

Time → O(n)



0 1 2 3 4 5 6 7 8 9 10 11

ht → 5 8 6 3 10 6 6 9 5 12 7 5

int water = 0

int flow = 0

int max = ht[0];

max index

```
for(int i=1; i< hts.length; i++) {
    ht = height[i];
    if( max < ht) {          i >= maxIndex
        water += flow;
        flow = 0;
        max = ht;
    } else {
        flow += (max - ht)
```

water = 0 7 21

flow = 0 2 7 0 4 8 9 14 0 5 12 15

max = 5 8 10 12

After one iteration — again move to

Sort the flow with

```
for (int i=length-1; i>=0; i--) {
    ht = height[i];
    if(max < ht) {
        water += flow.
        break;
    }
} else { flow += (max - ht);
}
```

max = ht[length-1];

flow = 0;