July 17, 2025

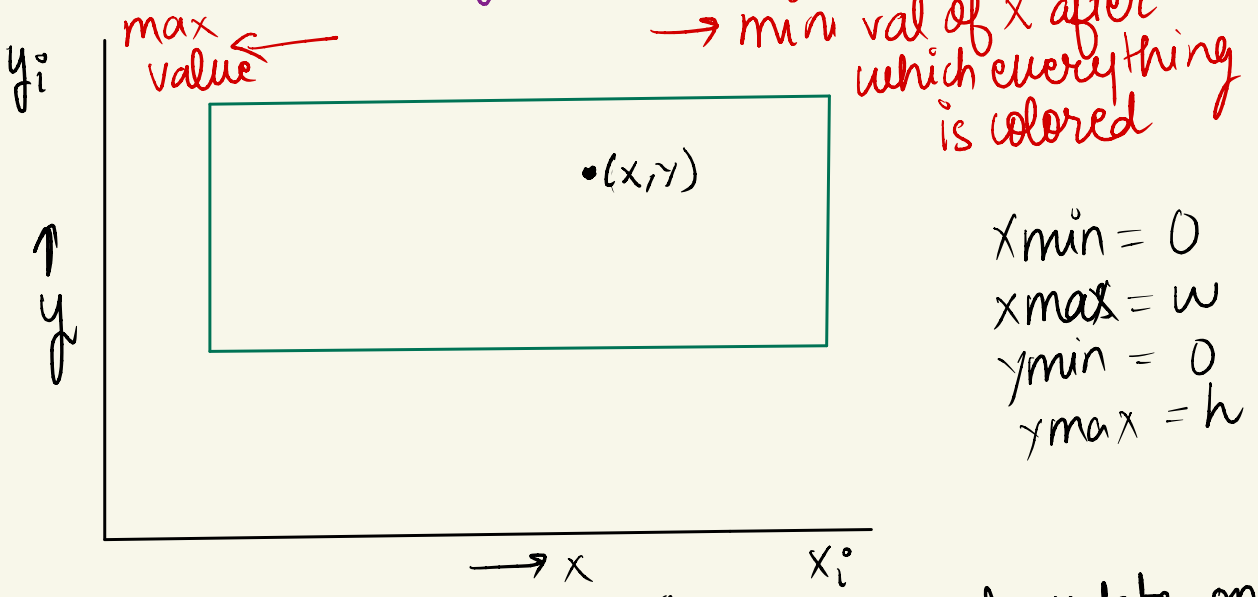
CONTEST 1 DISCUSSION

#1 Candy distribution in a line

Using for loop, T.C ⇒ O(N)

Using $\frac{n(n+1)}{2}$, T.C ⇒ O(1)

#2 Snuke's Coloring 2.



$x_{min} = 0$
$x_{max} = w$
$y_{min} = 0$
$y_{max} = h$

Maintain x_{min}, x_{max}, y_{min}, y_{max} and update on the basis of value a_i.

$a == 1$ $x < x_i$
$x_{min} = max(x_{min}, x)$

$a == 2$ $x > x_i$
$x_{max} = min(x_{max}, x)$

$a == 3$ $y < y_i$
$y_{min} = max(y_{min}, y)$

$a == 4$ $y > y_i$
$y_{max} = min(y_{max}, y)$

Height & width of resulting rectangle,
$h = max(0, x_{max} - x_{min})$
$w = max(0, y_{max} - y_{min})$
$area = h * w$ #ns

#3 Equation Solver

Find no. of real soln of $ax^2+bx+c=0$

$b^2-4ac>0$ → 2 soln ⇓ 2

$b^2-4ac<0$ → No solution ⇓ 0

$b^2-4ac=0$ → 1 ⇓ 1

Counter for when $a==0$ (1 soln)

& $a==0, b==0$ (0)

#4 Colour it!

N Blocks, K Paintboxes

If K==6

□ 6 options to color this | □ 5 options left | □ 5 | □ 5 | □ 5

Ans = $6*(5)^{n-1}$

If we have K colors, **Ans = $K*(K-1)^{N-1}$**

#5 Weird Sum – Easy Version

x = 4, l = 2, r = 7

1 2 3 4 5 6 7 8 9 10

2+3+4+5

3+4+5+6

4+5+6+7

Here (increase in freq, decrease in freq)

Freq	1	2	3	3	2	1
el	2	3	4	5	6	7

AlgoZenith

1	2	3	4
Prefix Sum: 1	1+2	1+2+3	1+2+3+4
PS(Prefix Sum) : 1	1+(1+2)	(1)+ (1+2)+ (1+2+3)	(1)+ (1+2)+ (1+2)+ (1+2+3+4)

Increasing pattern → I -- K

Stagnant → K --- K+1

Decreasing → K+1 -- N-1

Use the idea of prefix sum of a prefix sum to get contribution at each val which will result in O(N) soln.

#6 Time Complexity

((( )))

+1 +2 +3

↓ store

n^3

(( ))

1 2

↓ store

n^2

map first var will store the power of n

map second var will store the constant in front of n.

The map will be used to output the T.C.

```
string s;
cin >> s;
int depth = 0, flag = 0;
map<int, int>mp;
for (int i = 0; i < s.size(); i++)
{
    if (s[i] == 'f')
    {
        flag = 0;
        depth++;
        i += 2;
    }
    else if (s[i] == 'e')
    {
        if (depth == 0)
        {
            cout << "Compile Error\n";
            return;
        }
        if (flag == 0)
        {
            mp[depth]++;
            flag = 1;
            depth--;
        }
        else
        {
            depth--;
        }
        i += 5;
    }
}
if (depth > 0)
{
    cout << "Compile Error\n";
    return;
```

#7 Best Train Connection

Hint: Convert the given time in minutes and implement using two for loop. (Brute Force)