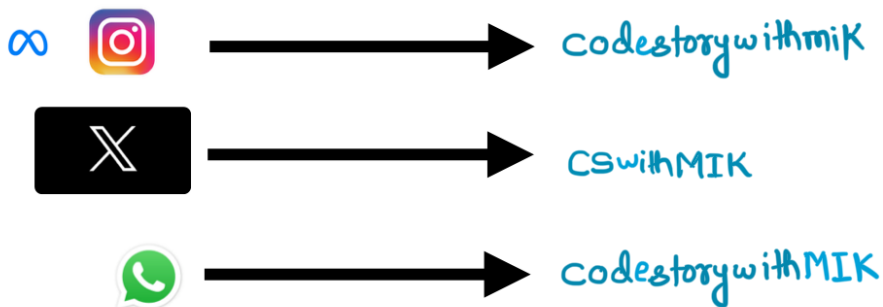


Maths : Video - 31



Try this channel to see "Life behind the scenes + Tech News"

Motivation -

6th Month of year 2025 has started.

June → Make a plan

Follow :- July, August, September, October,
November, December

Ready for 2026



MIK...

..Companies..

2929. Distribute Candies Among Children II

Medium Topics Companies Hint

You are given two positive integers n and $limit$.

Return the total number of ways to distribute n candies among 3 children such that no child gets more than $limit$ candies.

Example 1:

Input: $n = 5$, $limit = 2$

Output: 3

Explanation: There are 3 ways to distribute 5 candies such that no child gets more than 2 candies: (1, 2, 2), (2, 1, 2) and (2, 2, 1).

Example 2:

Input: $n = 3$, $limit = 3$

Output: 10

Explanation: There are 10 ways to distribute 3 candies such that no child gets more than 3 candies: $(0, 0, 3)$, $(0, 1, 2)$, $(0, 2, 1)$, $(0, 3, 0)$, $(1, 0, 2)$, $(1, 1, 1)$, $(1, 2, 0)$, $(2, 0, 1)$, $(2, 1, 0)$ and $(3, 0, 0)$.

Constraints:

- $1 \leq n \leq 10^6$

$0, 1, 2, \dots, limit$

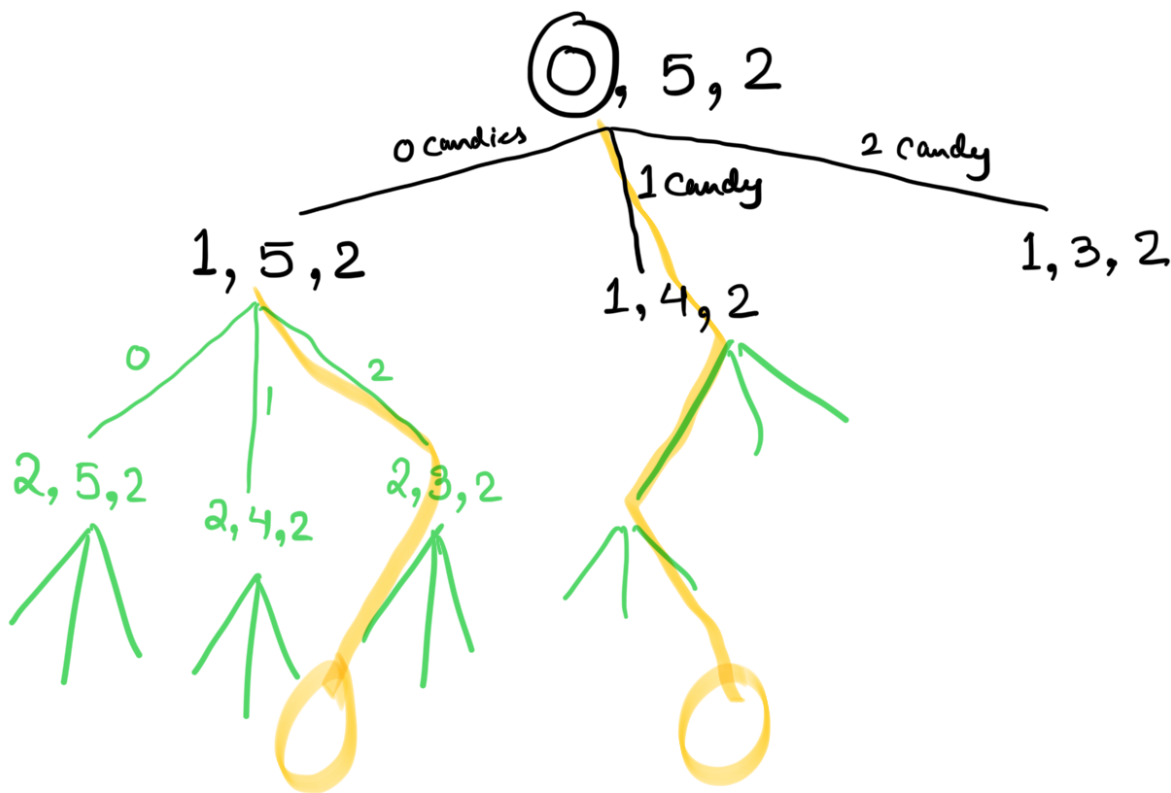
$$\frac{ch_1}{a} + \frac{ch_2}{b} + \frac{ch_3}{c} = n$$

⇒ AMAZON

⇒ RUBRIK

Thought Process

(How I will solve this in an interview)

$$n = 5, \quad \text{limit} = 2$$


Solve (0, π , limit)

```
int Solve (int countChild, int n, int limit) {
```

```
    if (countChild == 3) {
```

```
        if (n == 0)
            return 1;
```

```
    }
    return 0;
```

```
    int ways = 0;
```

```
    for (int assign = 0; assign <= min(n, limit) ; assign++) {
```

```
        ways += Solve(countChild+1, n - assign, limit);
```

```
    }
```

```
    return ways;
```

```
}
```

⇐ $n = 5$, $limit = 100$

⇐ $n = 100$, $limit = 5$

T.L.E.

ch1 ch2 ch3

limit * limit * limit

$O(limit^3)$

Approach-2

ch1

ch2

ch3

n = 5
limit = 2

```
for (ch1 = 0; ch1 <= min(n, limit); ch1++) {
```

```
    for (ch2 = 0; ch2 <= min(n - ch1, limit); ch2++)
```

```
        for (ch3 = 0; ch3 <= min(n - ch1 - ch2; ch3++)
```

```
            if (ch1 + ch2 + ch3 == n) {  
                ways++;  
            }  
        }  
    }  
}
```

T.C = $O(n^3)$

Approach-3

```
for (ch1 = 0; ch1 <= min(n, limit); ch1++) {  $\Leftarrow$  child 1
```

```
for (ch2 = 0; ch2 <= min(n - ch1, limit); ch2++) {  $\Leftarrow$  child 2
```

```
int ch3 = n - ch1 - ch2;  $\Leftarrow$  child 3
```

```
if (ch1 + ch2 + ch3 == n)  
    ways++;
```

T.C = $O(\min)^2$
 \Leftarrow

```
}  
}
```

```
return ways;
```



Approach - 4

$O(n^3)$ X
 $O(n^2)$ X
 $O(n)$ \Leftarrow

$n=5$, $limit=3$,

[a, b]

[2, 10]

children = 1

0, 1, 2, 3

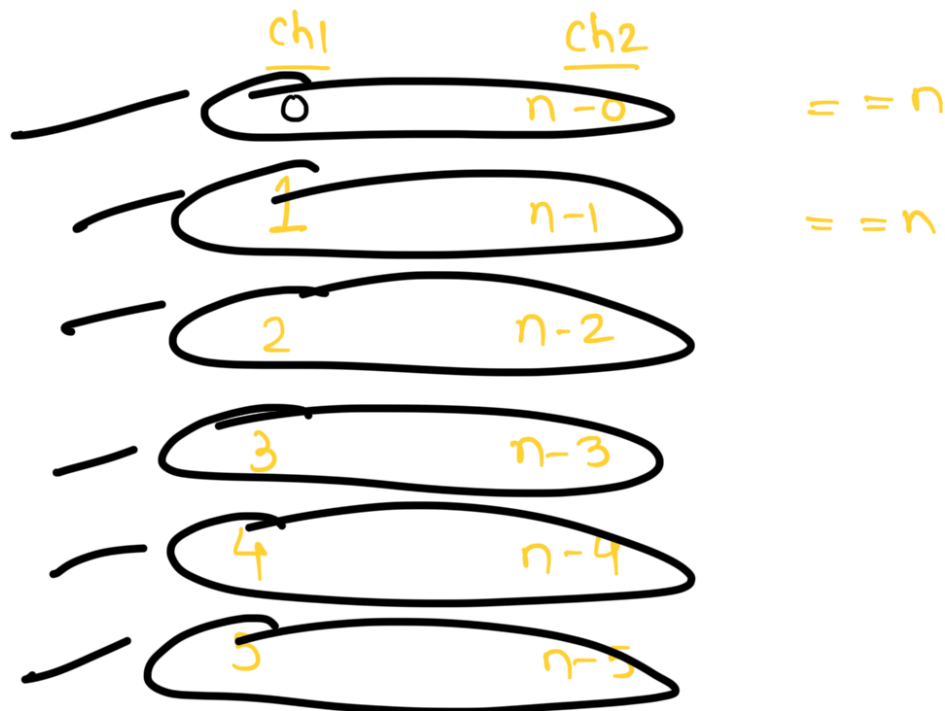
4 ways

$\min = 0 \rightarrow [0, 10]$
 $\max = 3 \rightarrow 10 - 2 + 1$

$[0, 3] \rightarrow 0, 1, 2, 3$

$n = 5, \text{ limit} = 3$

Children = 2



ch1 min
ch1 max

$(\max - \min + 1)$

$n = 5, \text{ limit} = 3$

ch1

ch2

2

5-2

3

5-3

$(2, 3)$

$(3, 2)$

$$\text{ch1 min} = 2 \text{ —}$$

$$\text{ch1 max} = 3 \text{ —}$$

$$3 - 2 + 1 = 2$$

children = 2

$n = 5,$

limit = 4

	ch1	ch2	
x	0	$5 - 0 = 5$	$= n$
✓	1	4	
	2	$5 - 2 = 3$	
	3	$5 - 3 = 2$	
	4	$5 - 4 = 1$	

$$(5 - 4) = 1$$

$\left[\underset{\uparrow}{1}, \underset{\uparrow}{4} \right]$

$$\rightarrow 4 - 1 + 1 = 4$$

ch1

minimum candies ?

↳

ch2

limit

candies

$(n - \text{limit})$

$$\text{ch1 min} = (n - \text{limit});$$

\uparrow
(ch2)

$$\text{ch1 max} = \text{limit}$$

Children = 3

n, limit

$N = (n - x) \cdot \text{limit}$

Ch1
 x

ch2
limit

ch3
limit

$n - 2 * \text{limit}$

$x \rightarrow$

$$\begin{aligned} \text{min} &= n - 2 * \text{limit}; \\ \text{max} &= \min(n, \text{limit}) \end{aligned}$$

for ($i = \text{min}; i \leq \text{max}; i++$) { //child 1

```
// (n-i);  
ch2 & ch3  
// limit
```

```
int N = (n-i); // for ch2 & ch3
```

```
int minCh2 = max(0, N-limit); ch3  
limit
```

```
int maxCh2 = min(N, limit);
```