Allocate mem for [large] array

> java Driver... large number

Binomial Coefficient

Coef in the binomial expansion $\binom{n}{k}$ = # in pascal's triangle

Ⓐ BCI

K=0 or K=n

$\bullet\ C(n,K) = \begin{cases} c(n-1,K-1)+c(n-1,K) \\ \end{cases}$

$$\begin{tikzcd}
c(n-1,K-1) \arrow[dr] & + & c(n-1,K) \arrow[dl] \\
& C(n,K) &
\end{tikzcd}$$

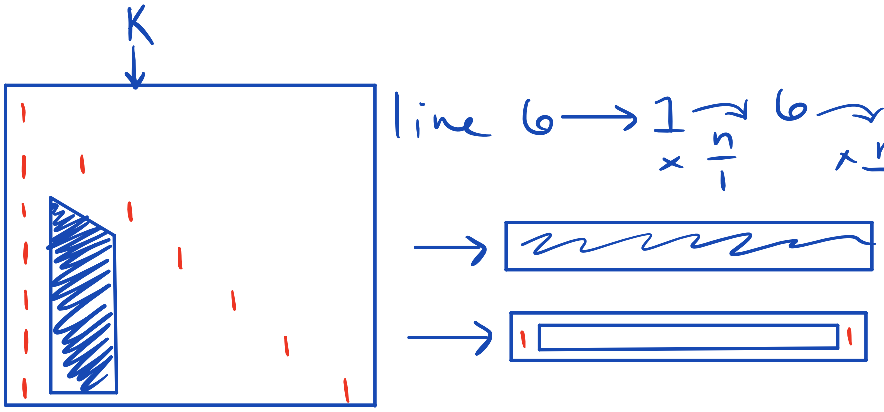
K

n \ K	0	1	2	3	4	5	
0	1						
1	1	1					
2	1	2	1				
3	1	3	3	1			
4	1	4	6	4	1		
5	1	5	10	10	5	1	
n → 6	1	6	15	20	15	6	1

Ⓑ Draw recursion tree for C(6,3)
* Don't use recursion for repetitive computation

Ⓒ Generate Coef in P.T. for n+1 rows
use 2D Array of size (n+1)x(n+1)

Ⓓ BCII – use frame from C [n,K]



$$\text{line } 6 \rightarrow 1 \xrightarrow[\times \frac{n}{1}]{} 6 \xrightarrow[\times \frac{n-1}{2}]{} 15 \xrightarrow[\times \frac{n-2}{3}]{} 20 \xrightarrow[\times \frac{n-3}{4}]{} K$$

Ⓔ $C(n,K) = \dfrac{n!}{K!\,(n-K)!}$

$$C(100,98) = \frac{100!}{98!\;2!} = \frac{99 \cdot 100}{2} = 4950$$

find largest of $K, n-K \longrightarrow$ largest, $n-$largest

$$C(n,K) = \frac{1 \cdot 2 \cdots \text{largest}, (\text{largest}+n) \ldots\ldots n}{\text{largest}!\,(n-\text{largest})!}$$

$$= \frac{(\text{largest}+1)(\text{largest}+2)\ldots\ldots n}{(n-\text{largest})!}$$