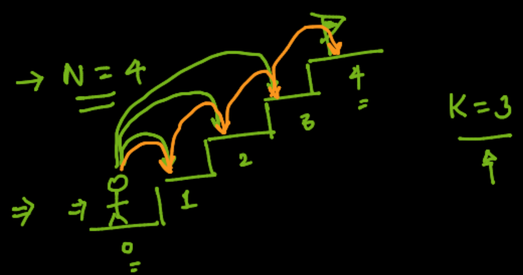
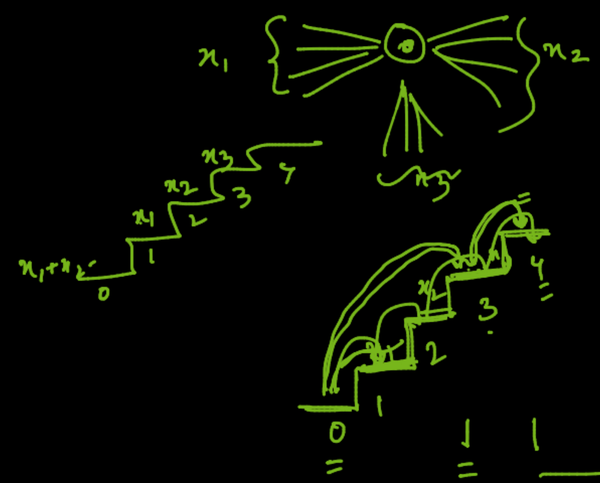
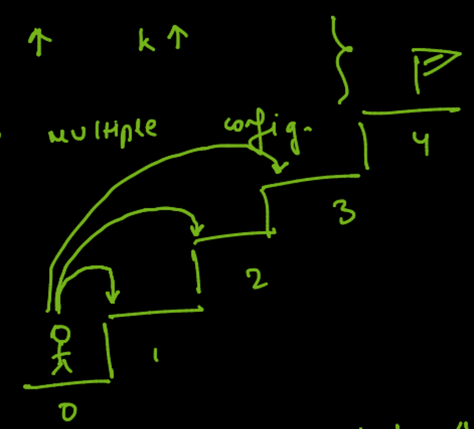


ways 0 to 4

↳ 1 1 1 1
1 1 2
1 2 1
2 1 1
2 2
1 3
3 1

7 ways

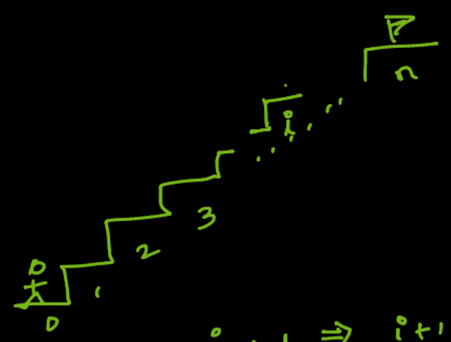




$0 \to 1$; 1 to 4 = → recursion → x_1
or
$0 \to 2$; 2 to 4 = → recursion → x_2
or
$0 \to 3$; 3 to 4 = → recursion → x_3

= 0 to 4

$= [x_1 + x_2 + x_3]$



$i \to 1 \Rightarrow i+1$ to n

$i \to 2 \Rightarrow i+2$ to n

$i \to 3 \Rightarrow i+3$ to n

$i \to K \Rightarrow i+K$ to n

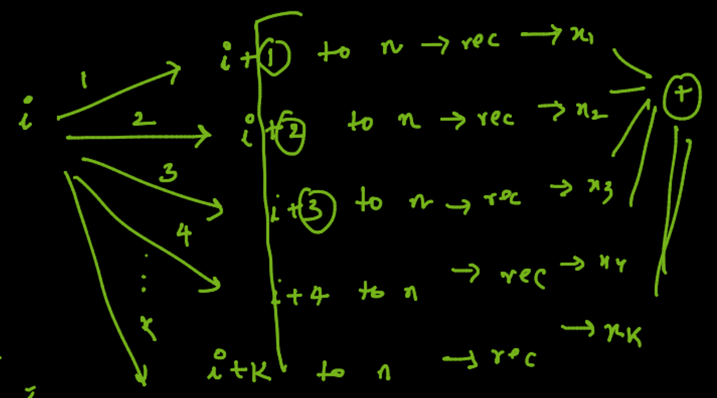
$\Rightarrow i \to i+j \to (i+j)$ to n

$1 \le j \le K$

⇓ recursion

$$f(n, k, i) = \sum_{j=1}^{k} f(n, k, i+j)$$

3 ⇑ (k)



$i \to i + j$; $1 \le j \le k$

$i \xrightarrow{j} i+j \to$ recurs

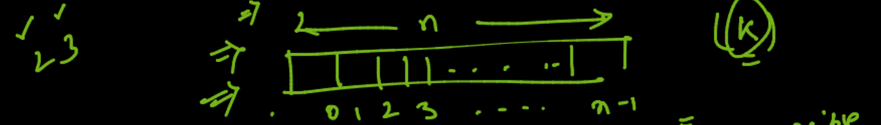
$$f(n, i, k) = \sum_{j=1}^{k} f(n, i+j, k)$$

② Keypad

(abc) (def) (ghi) n = 3

2 3 4

a d g
a e h
a f i
a e i



$k \cdot k \cdot k \cdots k \Rightarrow k^n$ possible

k=3

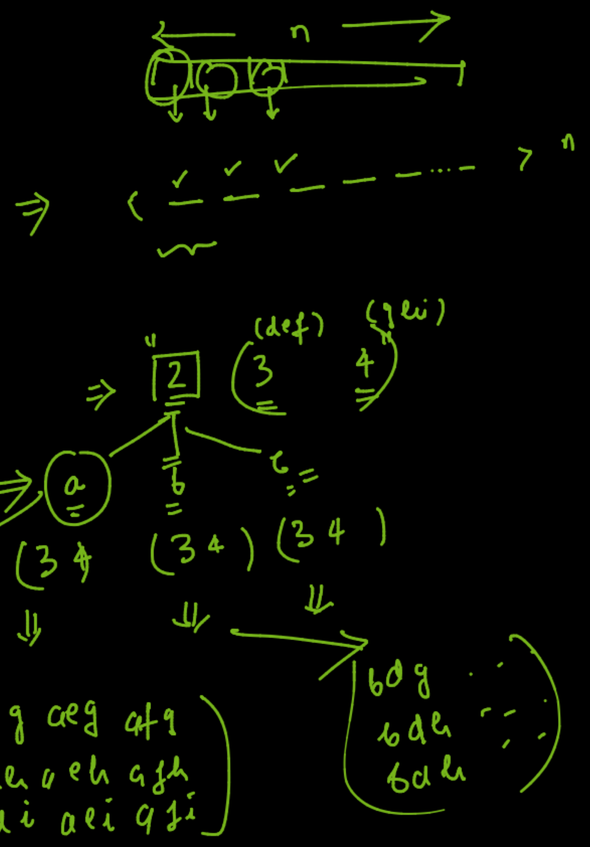
"2 3"

3 3 ⇒ 9

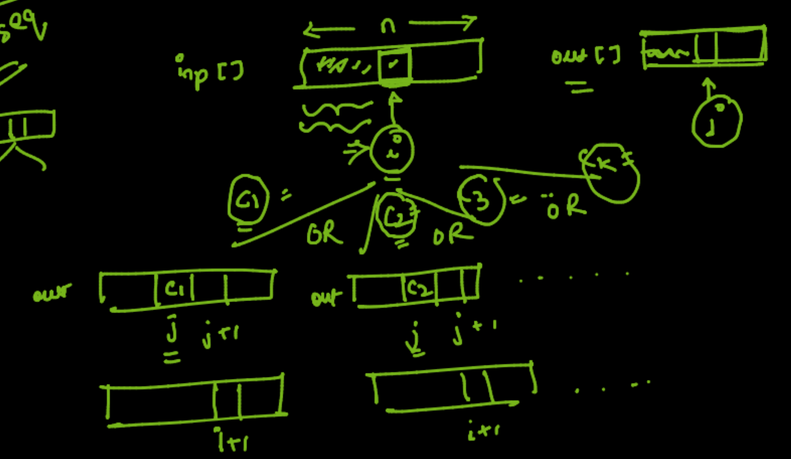
v.big

abc def

ad bd cd
ae be ce
af bf cf

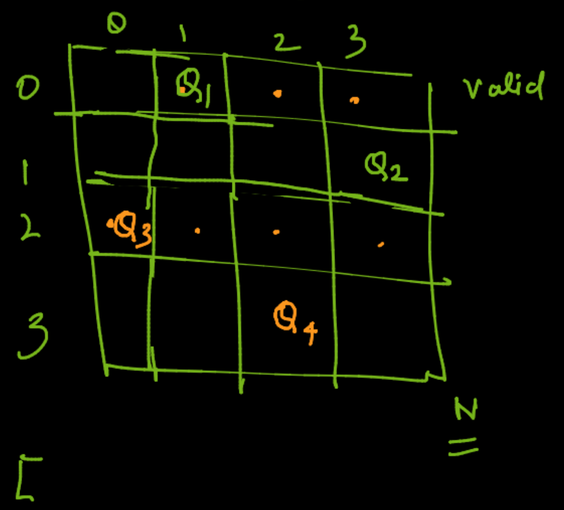


Subseq



i => 2 => a b c k=3

(3) N-Queens N = 4



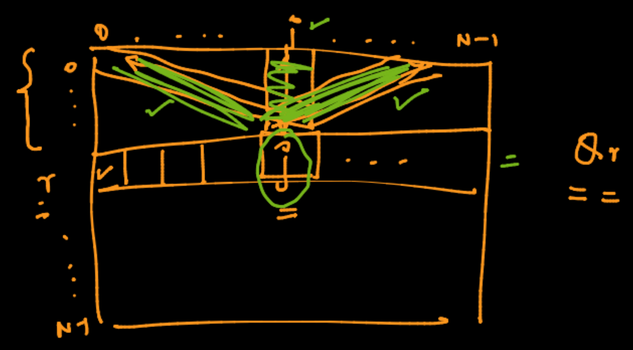
[

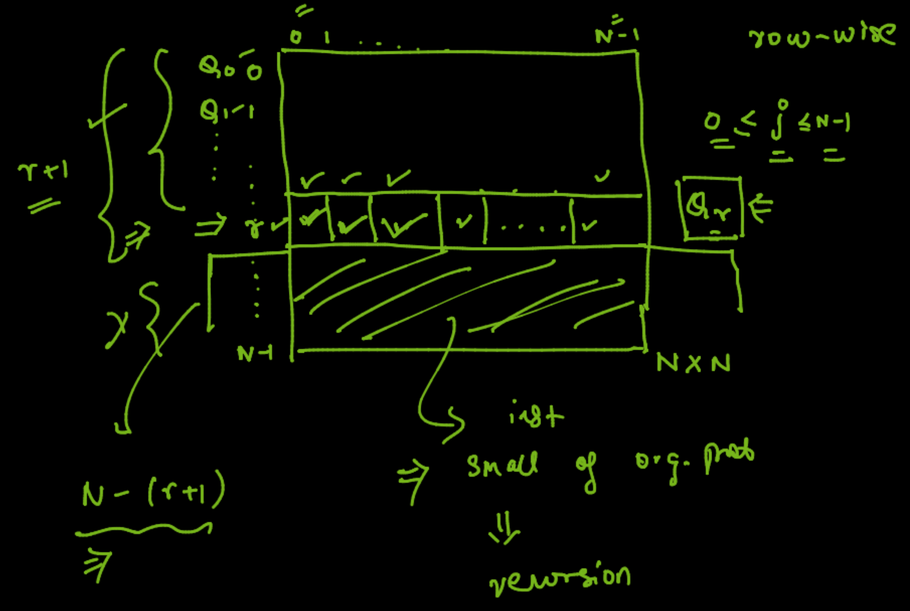
place 1 Q at time :

↳ ⇒ row-wise ⟺ ✓ (✓) =

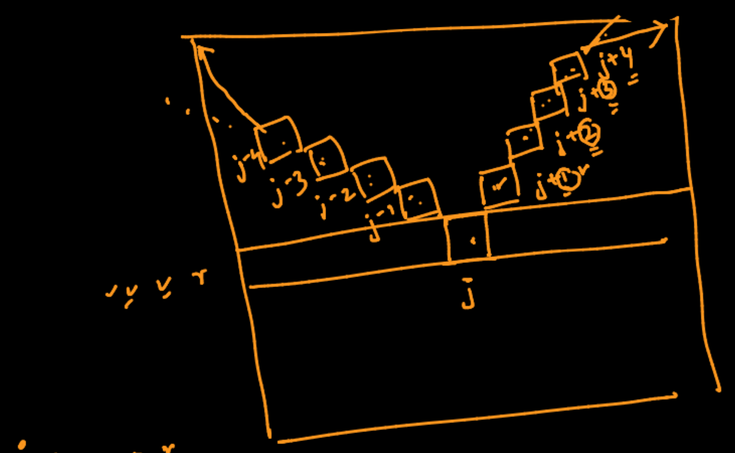
or

↳ ⇒ col-wise ⟺ ✓ (✓)





$0 \le j \le N-1$

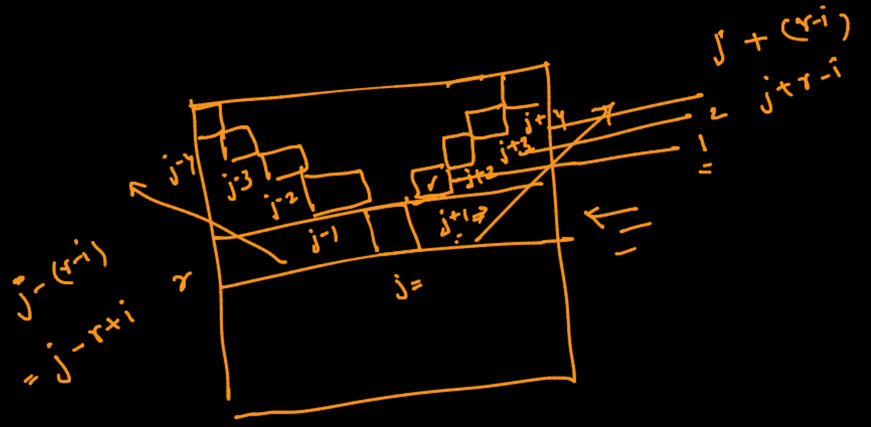


$i + n_0 = r$

$n_0 = r - i$

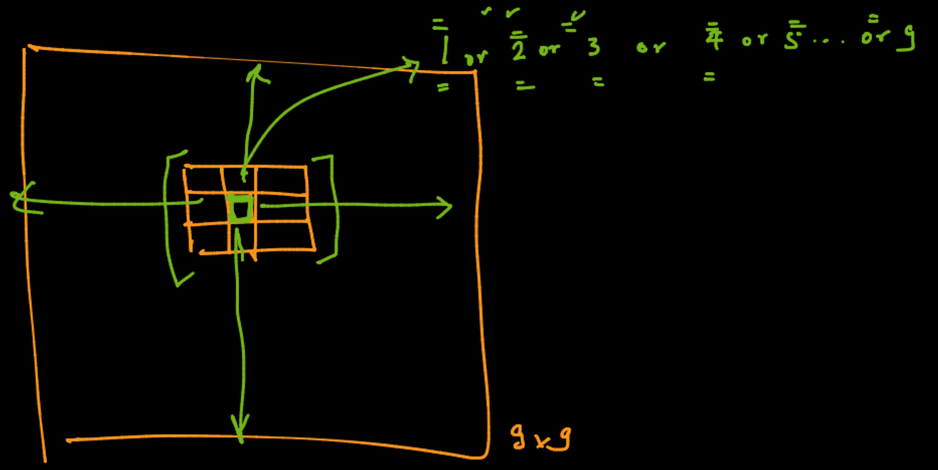
$j + (r - i) = j + r - i$

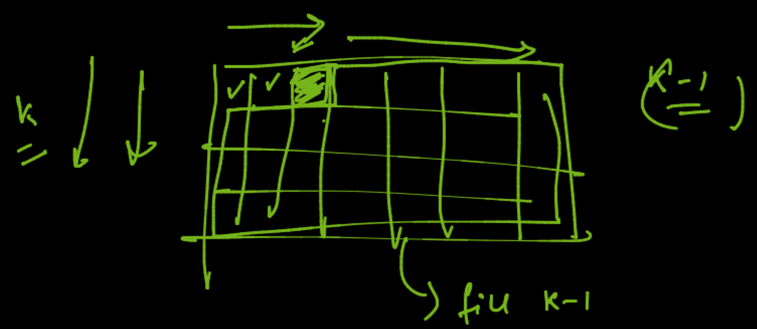
$j - (r - i) = j - r + i$


j+(r-i)
j-(r-i)
= j-r+i
r
j-3
j-2
j-1
j=
j+1
j+2
j+3
j+4
= 1
= 2

i + no = r

no = r - i


= 1 or = 2 or = 3 or = 4 or = 5 ... or = g
g x g


k = 1
(k-1 = 1)
fix k-1