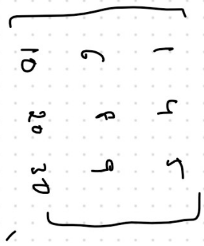
2D Array

Applications :

1. Transpose of Matrix
2. Rotation of matrix — >90° , <90° (Home work)

$$\begin{bmatrix} 1 & 4 & 5 \\ 6 & 8 & 9 \\ 10 & 20 & 30 \end{bmatrix}_{3\times 3} \quad >90^\circ$$



$$\begin{array}{c|ccc} & 0 & 1 & 2 \\ \hline 0 & 10 & 6 & 1 \\ 1 & 20 & 8 & 4 \\ 2 & 30 & 9 & 5 \end{array}_{3\times 3}$$

formula(or) way

$$\begin{array}{c|ccc} i \backslash j & 0 & 1 & 2 \\ \hline 0 & 1 & 4 & 5 \\ 1 & 6 & 8 & 9 \\ 2 & 10 & 20 & 30 \end{array}_{3\times 3} \qquad \begin{array}{c|ccc} i \backslash j & 0 & 1 & 2 \\ \hline 0 & 10 & 6 & 1 \\ 1 & 20 & 8 & 4 \\ 2 & 30 & 9 & 5 \end{array}$$

Set-I org

i = 0

a[0][0] = 1
a[0][1] = 4
a[0][2] = 5

(size-1)

a[0][2] = 1
a[1][2] = 4
a[2][2] = 5

(size-1-i)
3-1-0 = 2
3-1-1 = 1

Set-II

i = 1

a[1][0] = 6
a[1][1] = 8
a[1][2] = 9

answer

a[0][1] = 6
a[1][1] = 8
a[2][1] = 9

∴ >90°

arr[i][j] = new_matrix[j][(size-1-i)]

i = 0   k = arr.length-1 = 3-1   O = 0

for( ){
for (k){

}

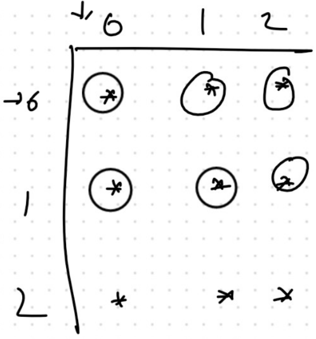
ans

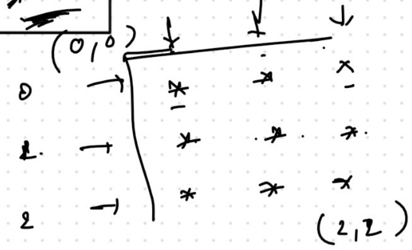
	0	1	2
0	1	2	3
1	4	5	6
2	7	8	9

0,0

→ 90°

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





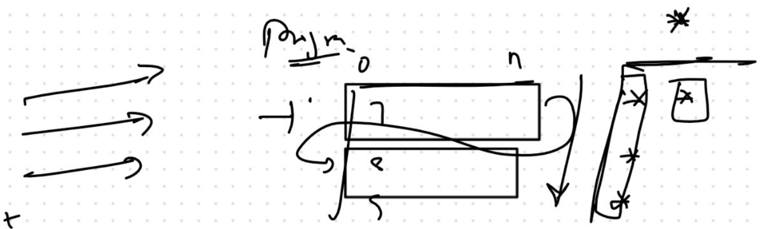
set-1
i,j (0,0) → k,i (2,0)
(0,1) → (1,0)
(0,2) → (0,0)

i=0 j=0

pointers

set-2
i,j (1,0) → k,i (2,1)
(1,1) → (1,1)
(1,2) → (0,1)

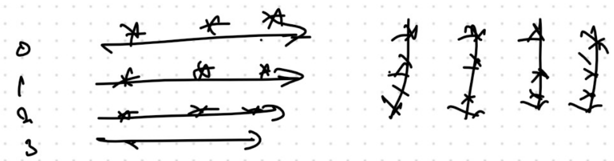
newArr[i][j] = arr[k][i];



print

< 90°

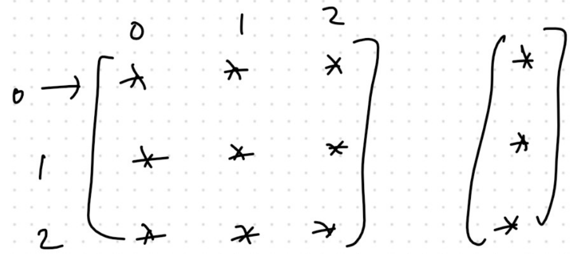
home work



logical

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \xrightarrow{\text{2D Array}} \begin{bmatrix} 3 & 6 & 9 \\ 2 & 5 & 8 \\ 1 & 4 & 7 \end{bmatrix}$$

ans



Complex
2D Array
following program
& logic

< 90° better build