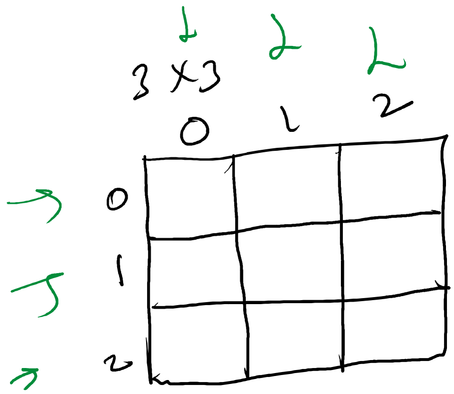
Class 7 - 2D Arrays

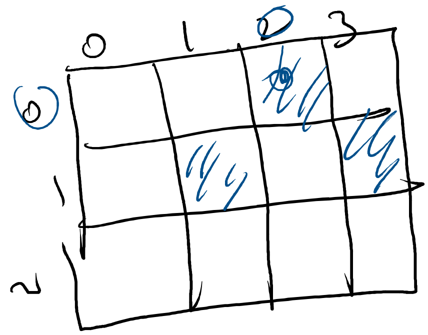
Saturday, April 26, 2025 12:37 PM

matrix

3 x 3



3 x 4



(1,1)
(0,2)
(1,3)

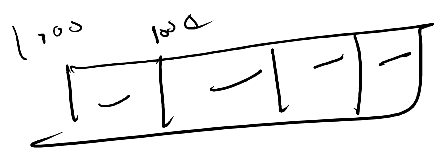
→ $\underbrace{\text{int arr[][] = new int[3][4]}}_{\text{matrix of } 3 \times 4}$

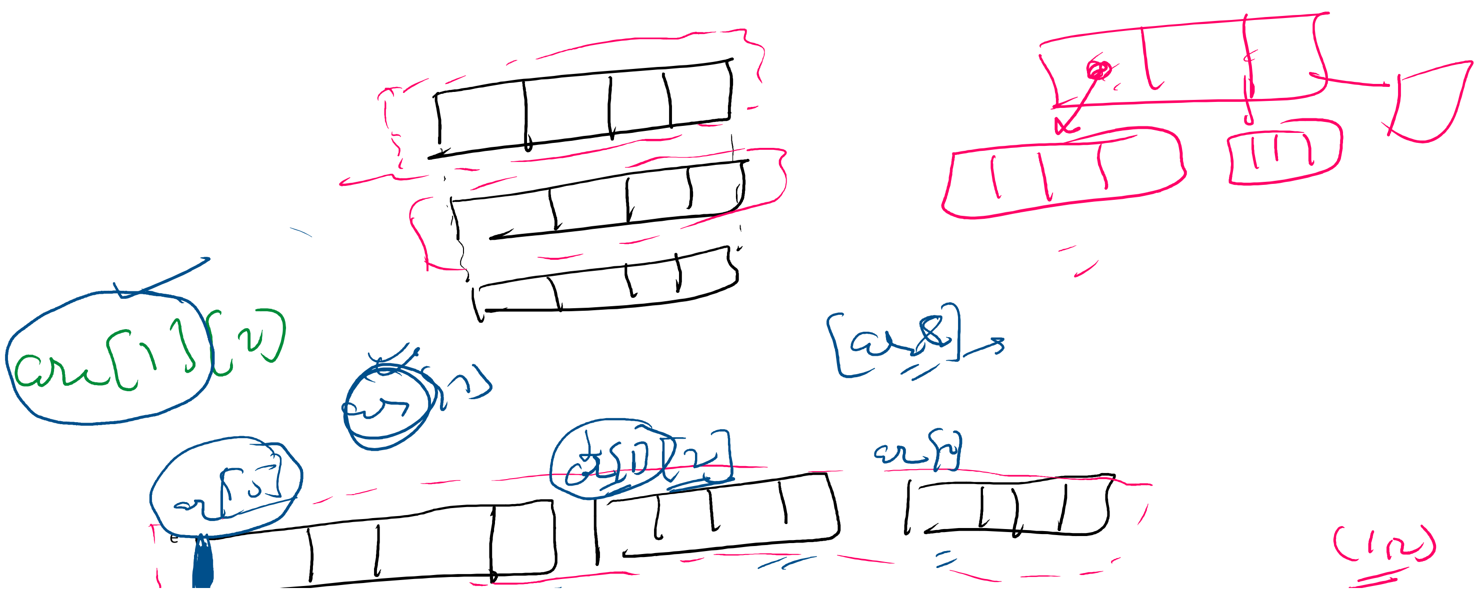
3 → rows, 4 → cols

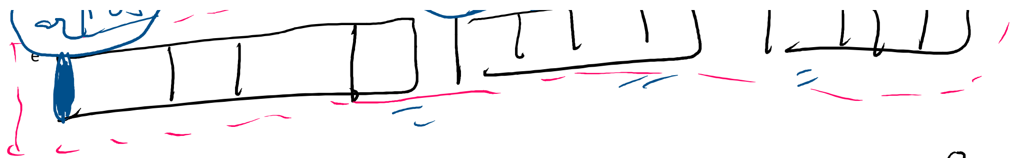
3 x 4

Memory Representation

int

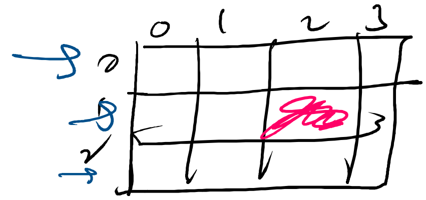






(1,2)

arr[2][0]



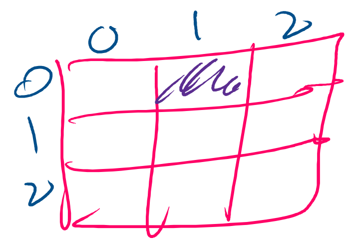
How to use 2D Arrays

(i, j) (0,1)

→ Visualize as 2D Matrix

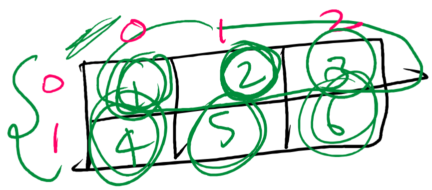
→ Row is represented by i

→ Col ——————— by j



3+3

2+3



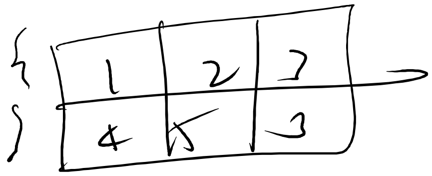
rows = 2

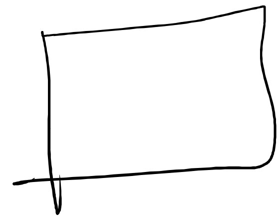
Col = 3

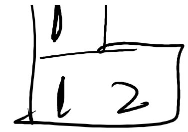
```
{
for (r 0 - 1)
  for (c 0 - 2)
    sout (arr[i][j])
}
```

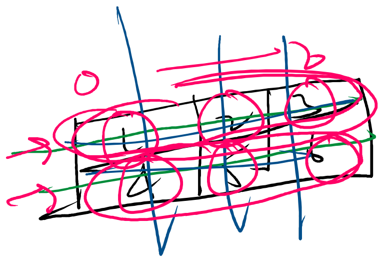
r	c	arr[r][c]
0	0	1
0	1	
0	2	4
1	0	
1	1	

Jagged array



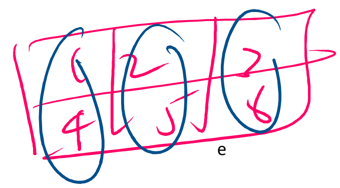






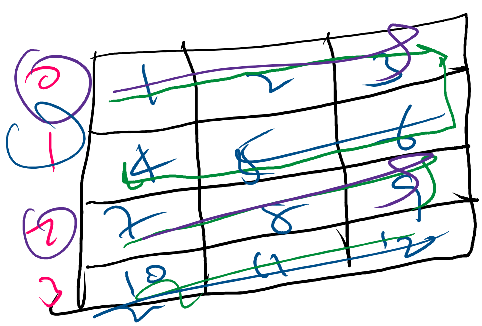
→ rowwise print

→ r = 0 1



1 4
2 5
3 6

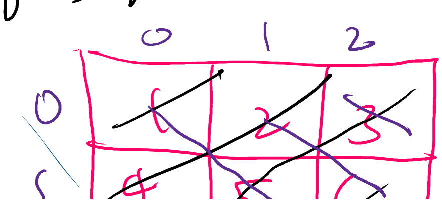
Alternate Order



1 2 3 6 5 4
7 8 9 1 2 11 10

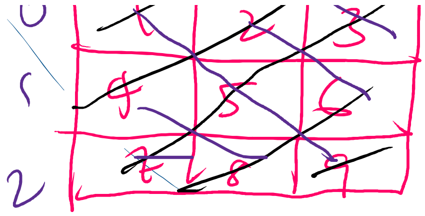
Concept of diagonals

n = 3
3×3



(1, 5, 9) } major
(3, 5, 7) } Diagonals

(0,1)
(1,2)



(0,0) (1,1) (2,2)

(i+j == n-1) → [(0,2) (1,1) (2,0)

⊛ To write any diagonal in a 2D matrix, there will always be a unique relation b/w (i & j) for every diagonal.

e

e (2,4) ⇒ (0,1) (1,0) i+j == 1

3 x 4

	0	1	2	3
0	1	2	3	4
1	5	6	7	8
2	9	10	11	12

(0,0) e; (1,1)
(2,2)

Transpose of a matrix

↳ rows → columns

cols → rows

2x3

1	2	3
4	5	6

1 4
2 5
3 6