

## 2D Arrays

**MATRIX** (ROWS & COLUMNS)

# Multi-dimensional Arrays

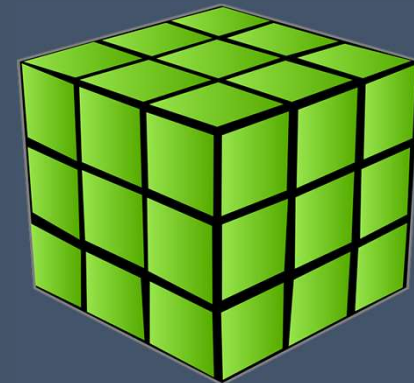
**1D**

1	2	3
---	---	---

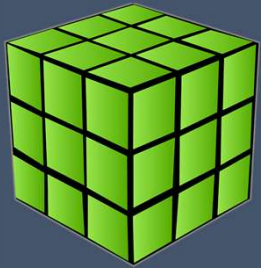
**2D**

1	2	3
5	6	7

**3D**



## Real-Life Examples

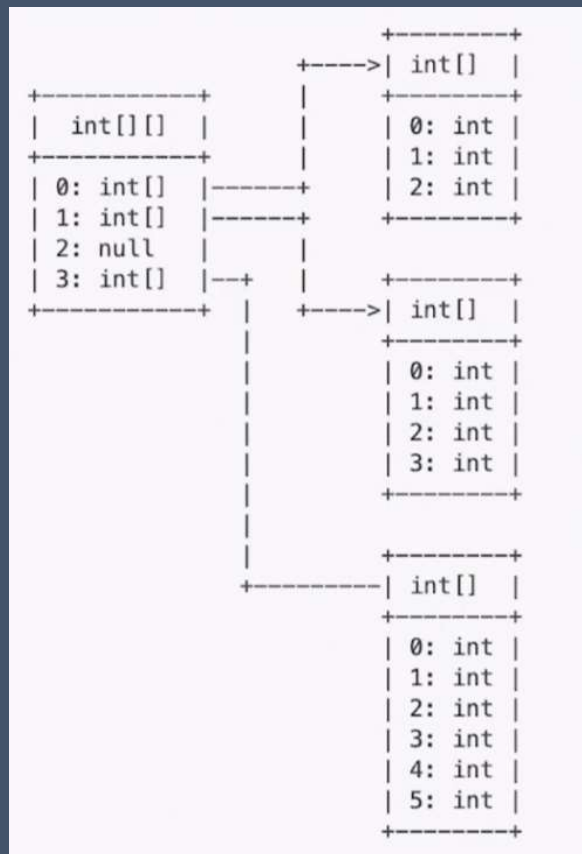


# Representation

rows = 4  
columns = 3

	0	1	2
0			
1			
2			
3			

## 2D Arrays in Memory



# Spiral Matrix

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Output : 1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10

# Spiral Matrix

Approach

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

# Diagonal Sum

$$n = m$$

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

34 34



## Search in Sorted Matrix

10	20	30	40
15	25	35	45
27	29	37	48
32	33	39	50

Search for a key in row wise & col wise sorted matrix