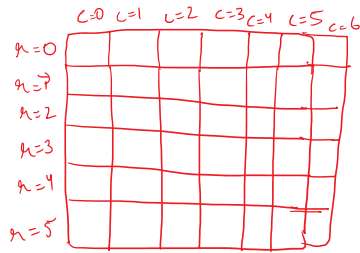
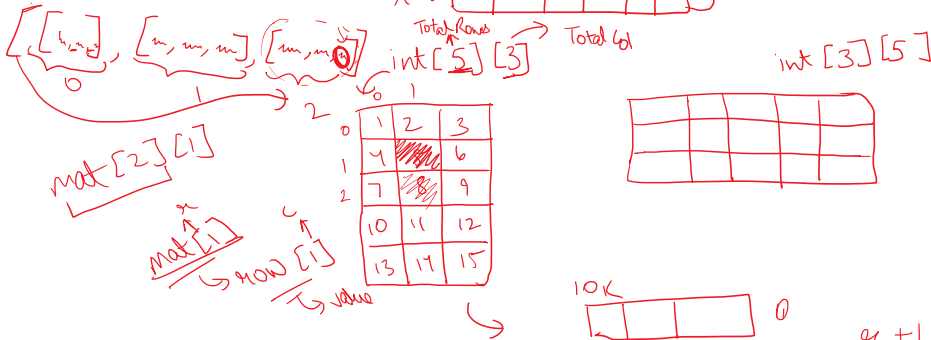


* Array of Arrays
↳ 1D ↳ 1D

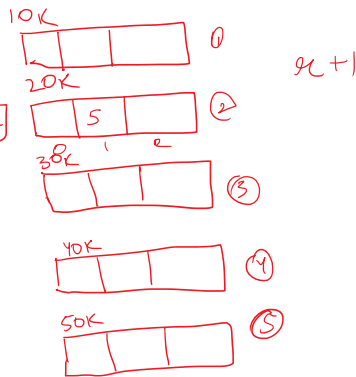


$[[]_0, []_1, []_2]$

$[10, 20, \underline{30}]$
 0 1 2



mat = ⑥ $[10K, 20K, \underline{30K}, 40K, 50K]$
↳ 2D Array
mat[1][1] - 5

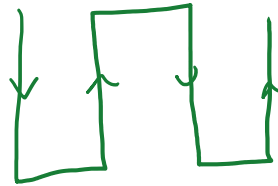


HW
Wave Print

```
int[][] arr = {{11,12,13,14},{21,22,23,24},{31,32,33,34},{41,42,43,44}};
```

Input

	$c=0$	$c=1$	$c=2$	$c=3$
$r=0$	11	12	13	14
$r=1$	21	22	23	24
$r=2$	31	32	33	34
$r=3$	41	42	43	44



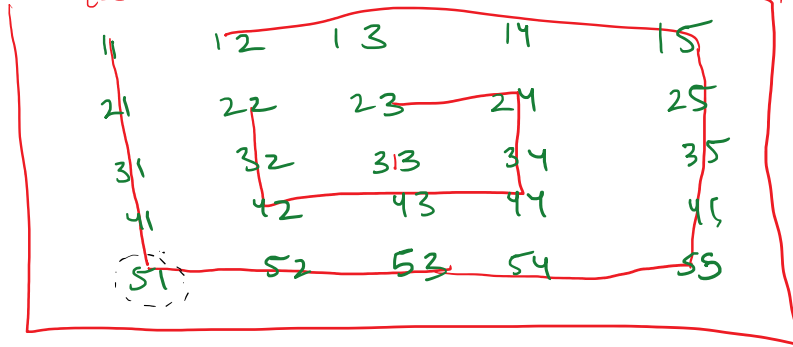
$r \downarrow$		c
	3 ✓	0
	2	1 ✓
	1	2
	0	3

Output

```
11 21 31 41
42 32 22 12
13 23 33 43
44 34 24 14
```

Anticlockwise
l=0

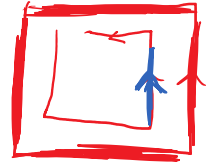
c = cols-1



$$Gt = 0 + r$$

$$tot = row \times col$$

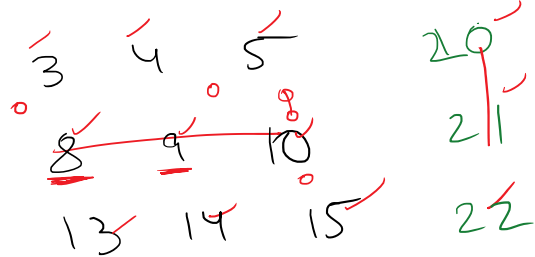
min k



min col \rightarrow max row \rightarrow max col \rightarrow min row

\downarrow
min++ max--

4
 \hookrightarrow min row
 \hookrightarrow min col
 \hookrightarrow max row
 \hookrightarrow max col



Search in 2D sorted array

```
mat[4][4] = { {10, 20, 30, 40},
               {15, 25, 35, 45},
               {27, 28, 37, 48},
               {29, 33, 39, 50}};
```

Input : x = 29

Output: Found at (3,0)

Input : x = 100

Output : Element not found

10 20 30 40 29?
 15 25 35 45
 27 28 37 48
 29 33 39 50

↳ Traverse the entire matrix
 and search for the element
 mid = 1

↳ Binary search in each row → Haru row se pucha
 kya tujhme element dikhta hai?
 ↳ Binary search in each col

Binary Search

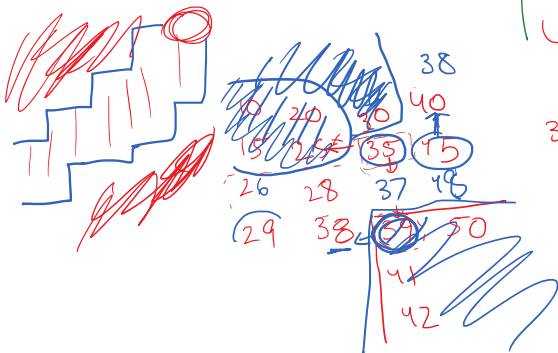
min m = 0

max m = 3

min c = 0

max c = 3

25 < 29



35 < 38

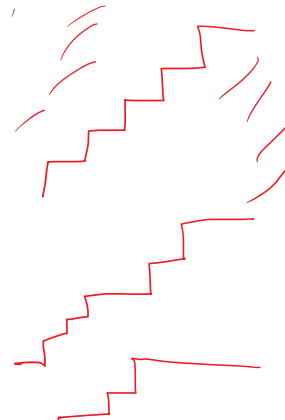
39 > 38

10	20	30	40	38
15	25	35	45	
27	28	37	48	
29	33	39	50	

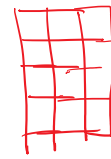
10	20	30	40
15	25	35	45
27	28	37	48
29	33	39	50

10	20	30	40
15	25	35	45
27	28	37	48
29	33	39	50

row = mat.length

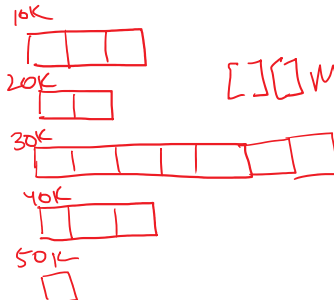


Normal `int[][] mat = new int[5][3];`



↳ `[--, --, --, --, --]`

Jagged Matrix



`[][] mat = [10K, 20K, 30K, 40K, 50K]` ✓

`int[][] mat = new int[5][];`

`[20K, null, null, null, null]`

`mat[0] = 20K`

nulla
↳ beghan
↓
Koi address

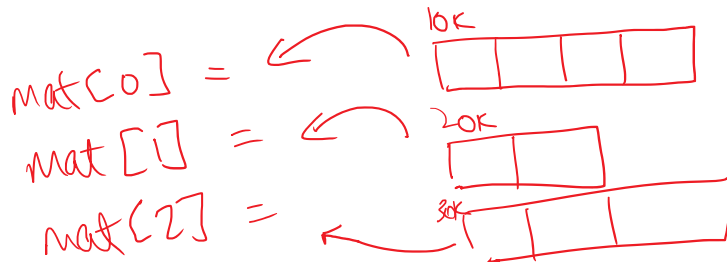
Heap
20K
[,]

`int[][] arr = new int[][3];` ✗

Invalid

`[, , , ,]` ?? Kitno ke address store? Nahi Pata

`mat[i] = [0 1 2 3 4
10K, 20K, null, null, null]`



C.B

↳ 27th November

↳ DSA C++

↳ DSA Java

↳ Web D

Referral Bonus
Live → 200₹
+
Classroom → 500₹

Interview

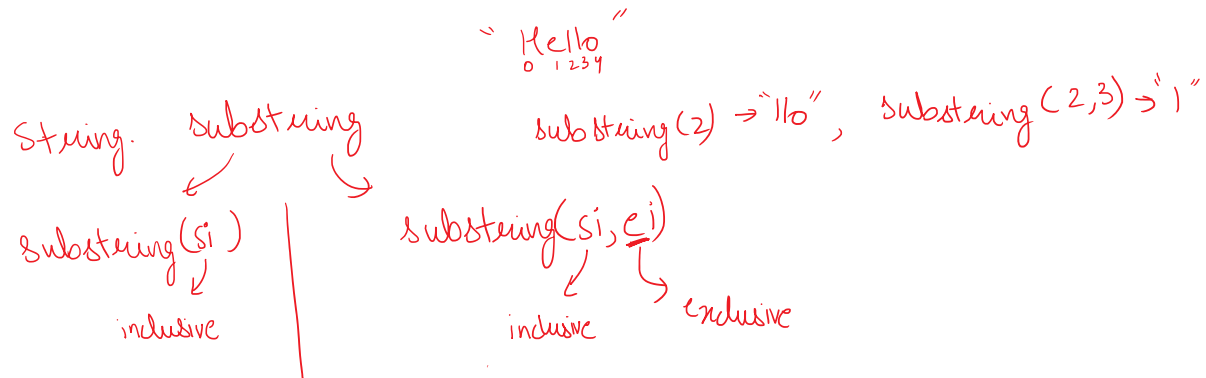
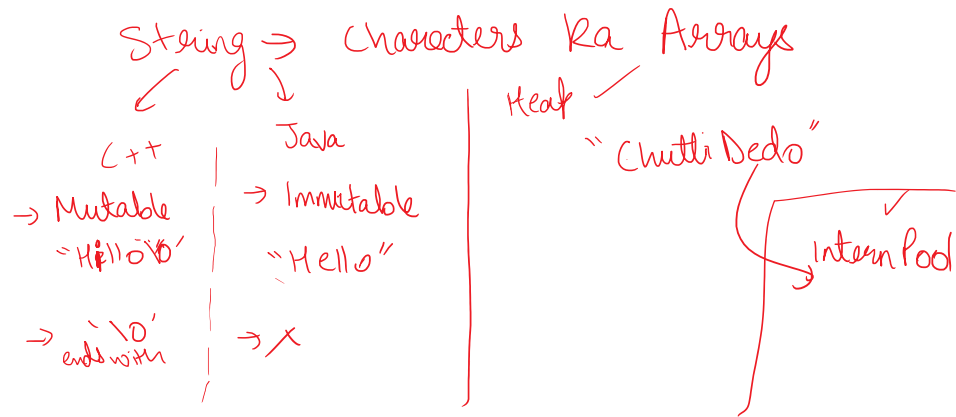
→ Communication

↳ Express

→ Problem solving 0

→ Coding?

Start code



Hw

"abcde"

a	b	c	d	e
ab	bc	cd	de	
abc	bcd	cde		
abcd	bcd			
abcde				

36
27

30 \rightarrow 3000 Marks

$\frac{30}{80}$