MULTIDIMENSIONAL ARRAY

2D Array

Matrix

```
int arr[][] = new int[3][4];
```

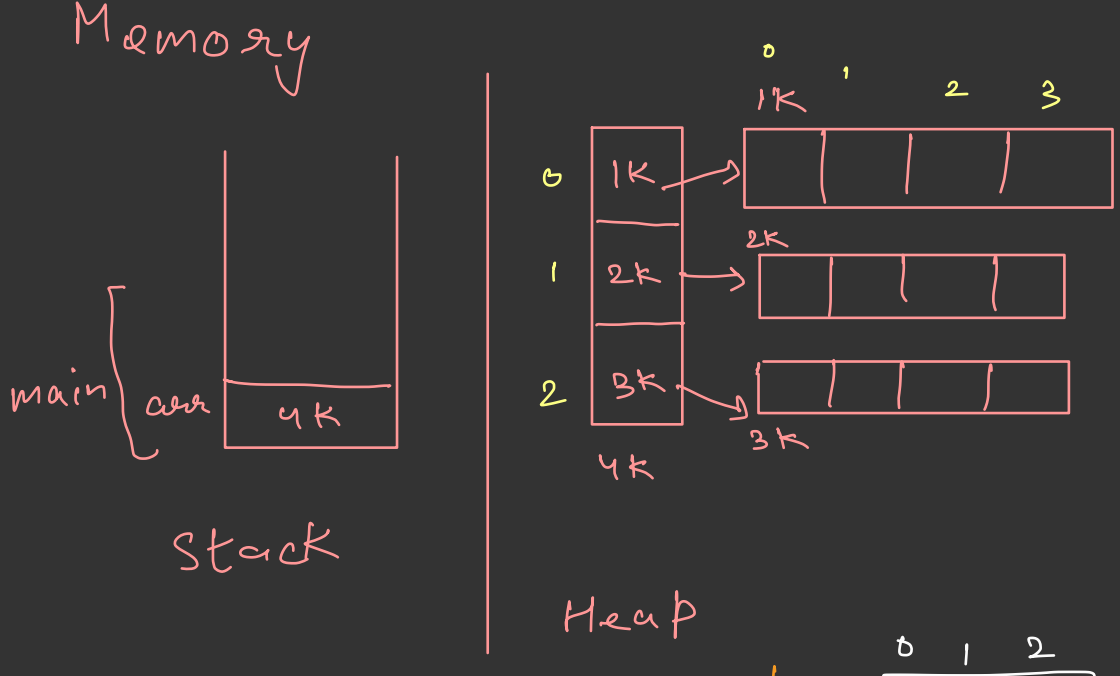
- `arr[][]` → It's a 2D Array
- `[3]` → row
- `[4]` → col

Abstract View

	0	1	2	3
0	arr[0][0]	[0][1]	[0][2]	[0][3]
1	[1][0]	[1][1]	[1][2]	[1][3]
2	[2][0]	[2][1]	[2][2]	[2][3]

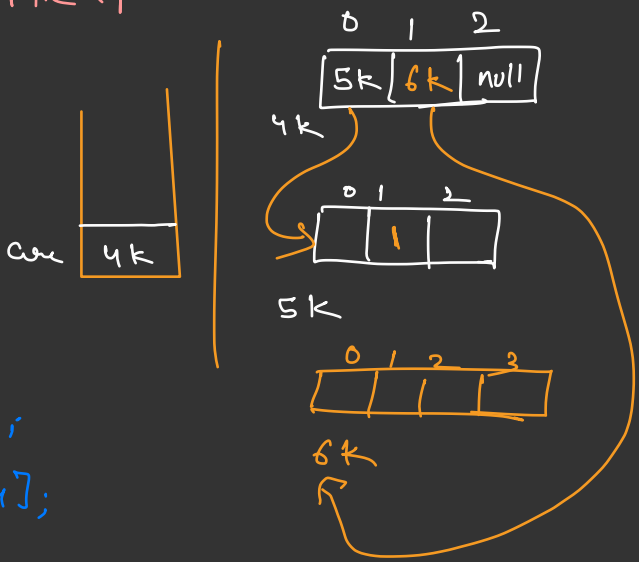
→ int arr[][];

→ arr = new int[3][4];



int arr[][]

arr = new int[3][];

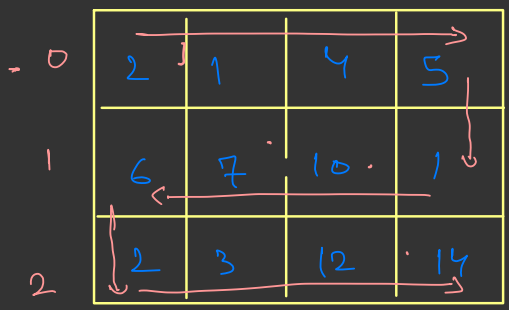


⇒ arr[0] = new int[3];

arr[1] = new int[4];

arr[0][1] = 1;

Ques zig zag Print



→ 0, 2, 4, 6
← 1, 3, 5, 7 ...

2, 1, 4, 5, 1, 10, 7, 6,
2, 3, 12, 14

	fix	st	ep	in/dec
Right	minR	minR	maxR	minC++
bottom	maxR	min C	max C	maxR--
right	max C	maxR	min R	maxC--
top	minR	max C	min C	minR++

Ques Print spiral

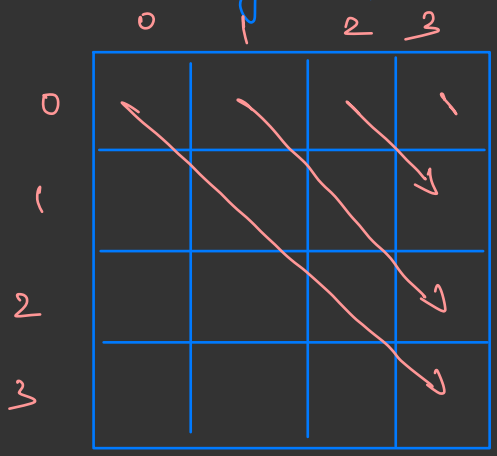
minR \ minC	0	1	2	3	4	5
0	11	12	13	14	15	16
1	21	22	23	24	25	26
2	31	32	33	34	35	36
3	41	42	43	44	45	46
maxR 4	51	52	53	54	55	56
5	61	62	63	64	65	66

11, 21, 31, 41, 51, 61, 62, 63, 64, 65, 66, 56, 46, 36, 26, 16, 15, 14, 13, 12,

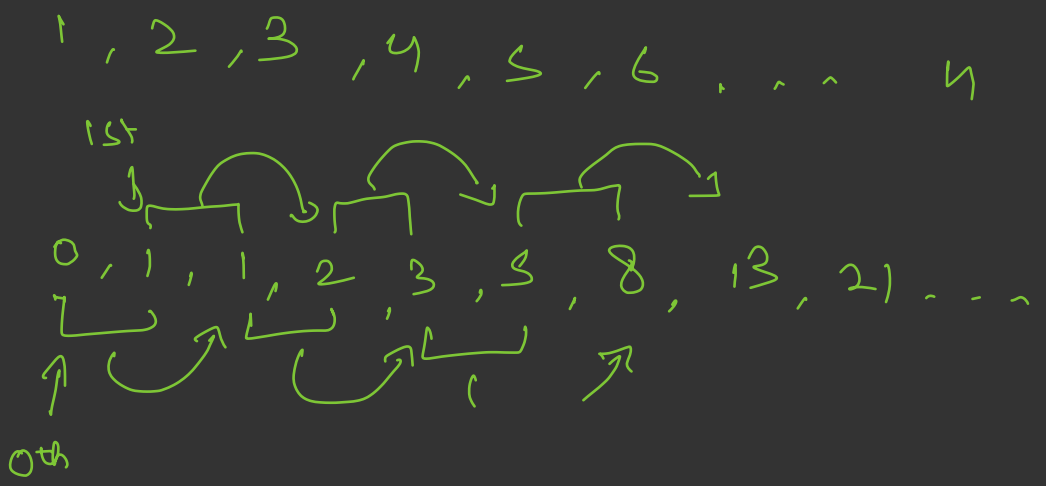
11, 21, 31, 41, 51, 61, 62, 63, 64, 65, 66

56, 46, 36, 26, 16, 15, 14, 13, 12, 22
32, 42, 52, 53, 54, 55, 45, 35
25, 24, 23, 33, 43, 44, 3

Ques Print digonal



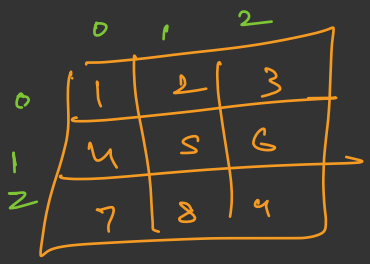
	0	1	2	3
0	1	2	4	7
1	3	4	5	8
2	5	8	10	12
3	7	11	13	15




```
b s  boolean isVowel(char c) {
return( c=='a' || c=='e' || c=='i' || c=='o'
      || c=='u' )
}
```

```
b  s  int countVowels ( String s) {
    int count = 0;
    for( int i =0;  i< s.length(); i++ ){
     char c = s.charAt(i);
      if ( isVowel((c)) {
      }      count++;
```

```
    }
    return count;
}
```




```
for(i=0; i<arr.l; i++){
    for(j=0; j<arr[i].l; j++){
        sysout(arr[i][j]);
    }
}
```

i j
0 0
1
2