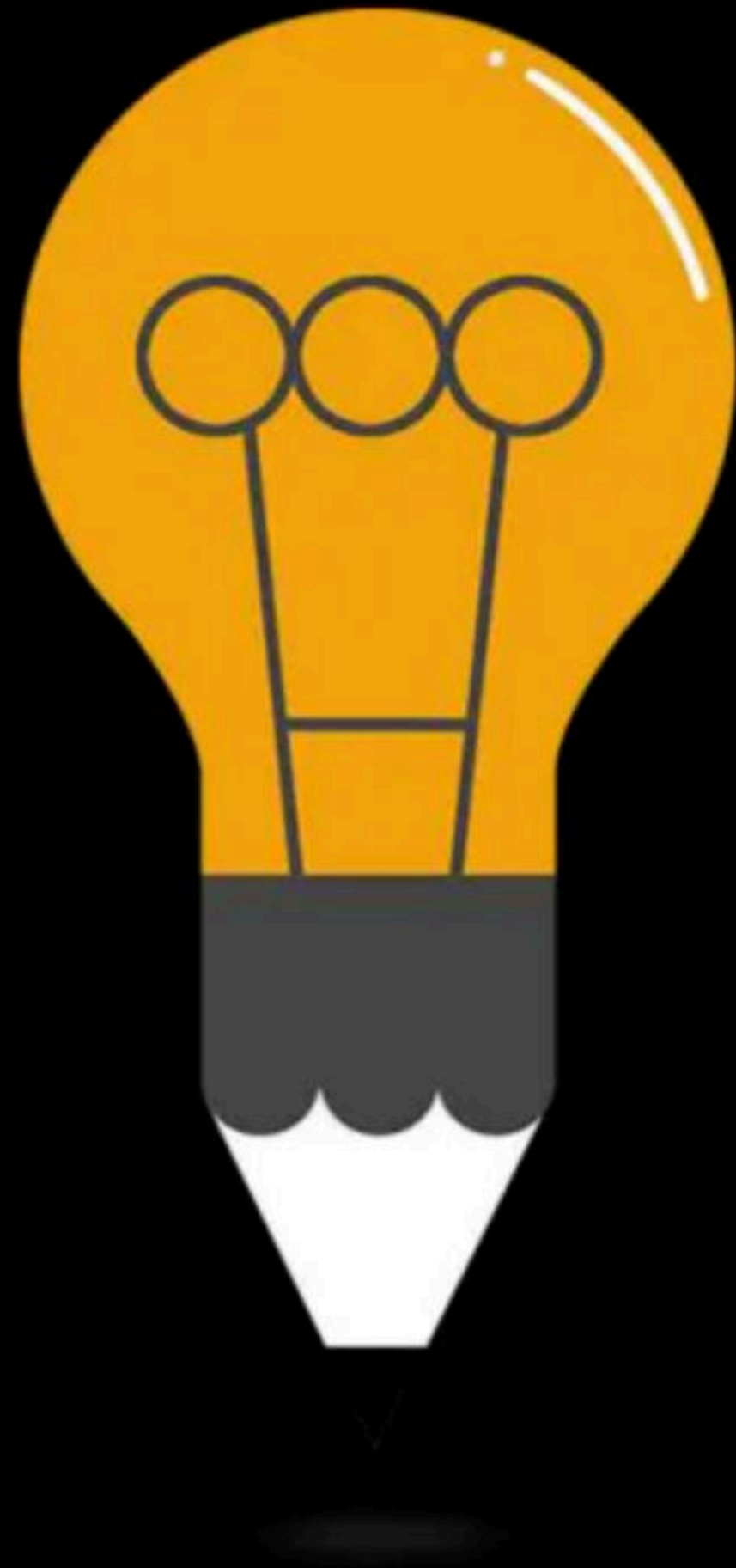


Structure and Union

Course on C-Programming & Data Structures: GATE - 2024 & 2025



Doubts & Arrays, Pointers

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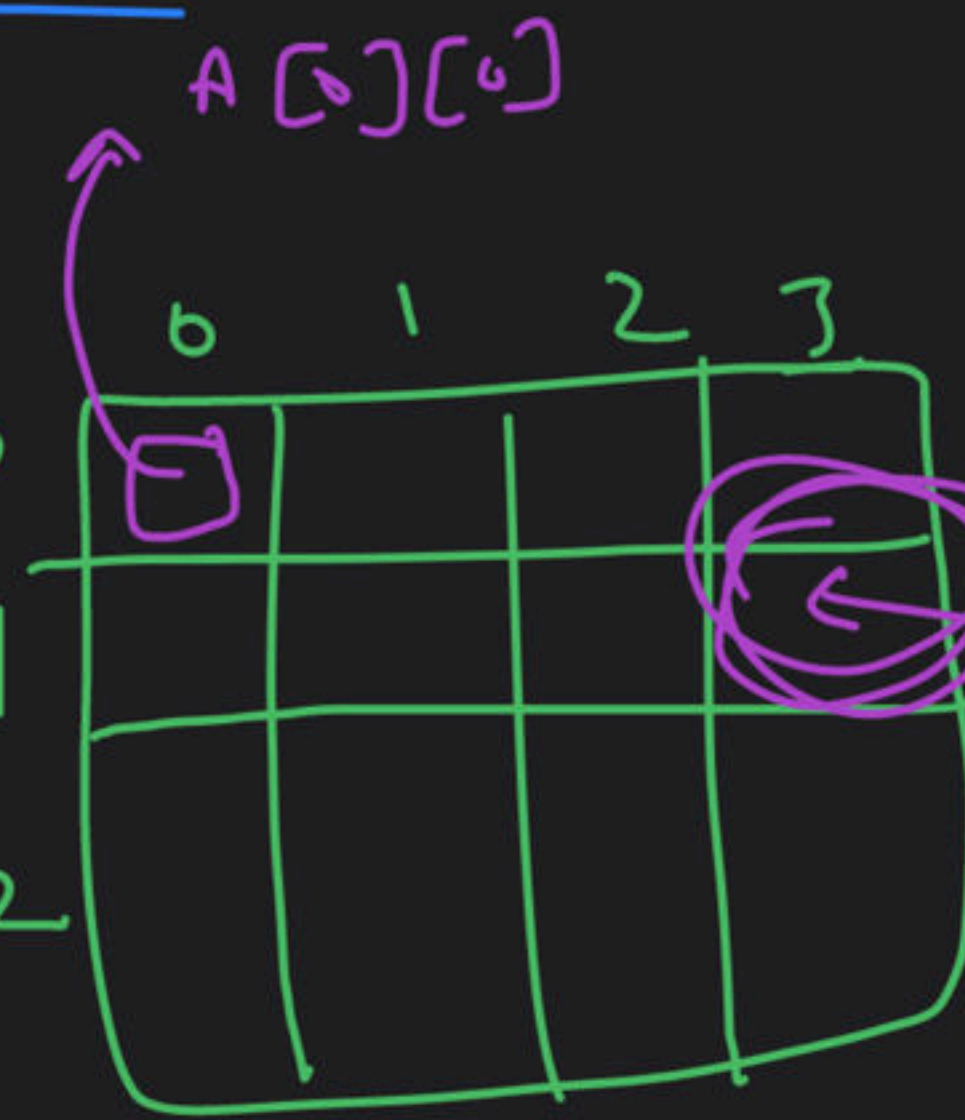
2-D array

int A[3][4];

A+0 → 0

A+1 → 1

A+2 → 2



A[0][0]

A[1][3]

&A[1][0]

2-D array

A

A+0

&A

&A[0] + 1

&A[2][3]

A[3][2]

→ base add. of array

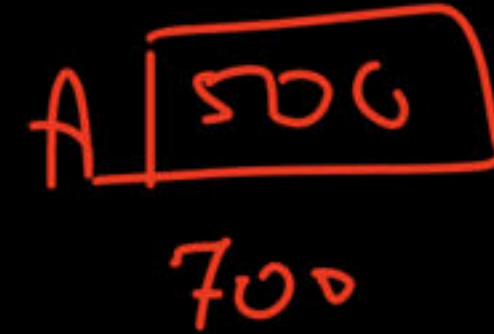
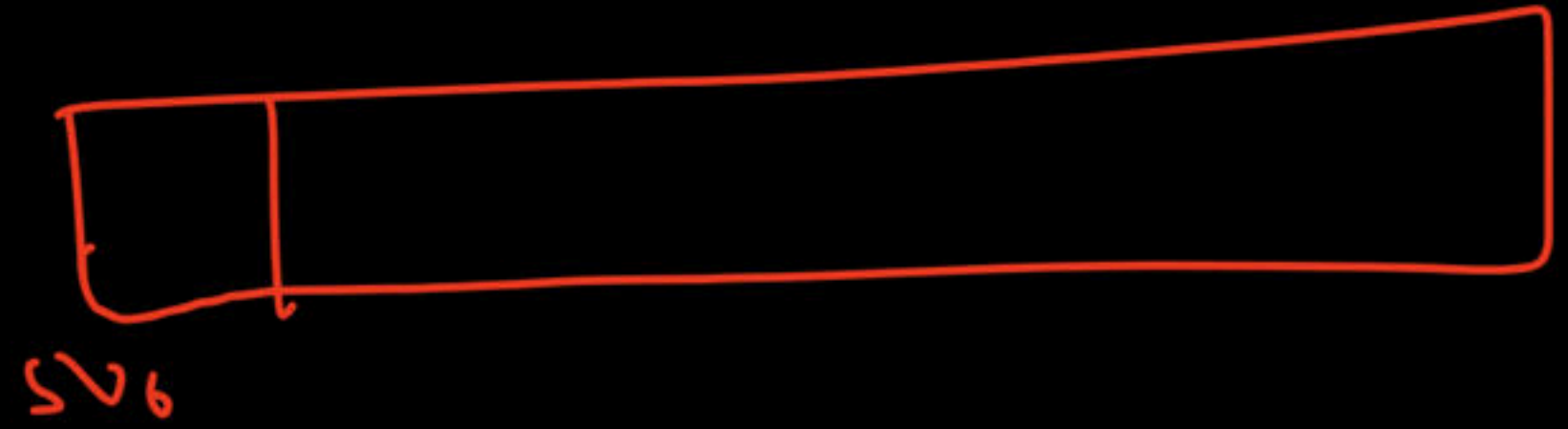
→ name of 0th row

→ add. of pointer A

→ add. of row 1

→ add. of element A[2][3]

→ element



&A[0]

A+0

same to same
row 0 name

~~*(&A[3][2])~~

↳ element A[3][2]

A [3] [4]

	0	1	2	3
0	500	502	504	506
1	508	510	512	514
2	516	518	520	522

← size of 1 row = 4 \times 2 = 8 byte

Base add. = 500

2-D array

```
int A[3][4];
```

```
&A[i][j] + integer;
```

```
&A[i] + integer;
```

```
&A + integer;
```

→ $\&A[i][j] + \text{size of element} \times \text{integer}$
→ $\&A[i] + \text{size of row} \times \text{integer}$
→ $\&A + \text{size of array}$

ex:-

$$\&A[0][0] + 3 = 500 + 3 \times 2 = 506$$

$$\&A[0][0] + 6 = 500 + 6 \times 2 = 512$$

ex:-

$$\&A[0] + 2 = 506 + 2 \times 8 = 516$$

A [500] 1576

assume:-

int A [16] [13];

Base add. = 500

row size
= $13 * 2 = 26$ bytes

array size = $16 * 13$ elements
= 208 elements

$$\&A[0] + 4 \Rightarrow 500 + 26 * 4 = 604 = 208 * 2 B$$

$$= 416 B$$

$$\&A[2] + 7 \Rightarrow 552 + 7 * 26 = 734$$

or

$$\&A[0] + 9$$

$$500 + 9 * 26 =$$

$$\&A + 2 \Rightarrow 1500 + 2 * 416 = 2332$$

2-D array

`&A[i][j] + integer` \Rightarrow Element

`&A[i] + integer;` \Rightarrow Row

`&A + integer;` \Rightarrow Array

Array of pointers vs Pointer to array

```
int (*p)[5];  
char (*cp)[5];  
float (*fp)[5];
```

$p++$ ✓

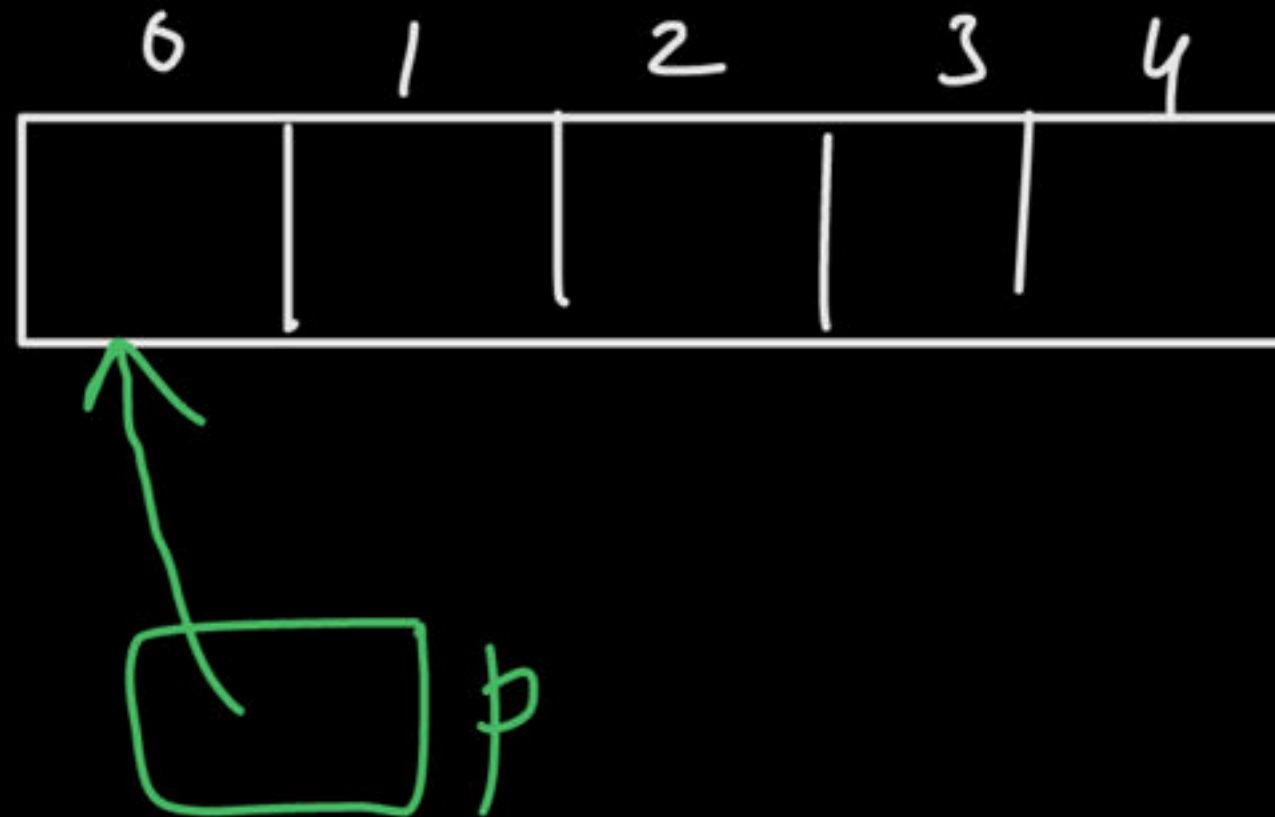
$\text{int } *p;$

$\text{int } *p;$

$\text{int } *p;$

← same
to same

$\text{int } (*p)[5];$

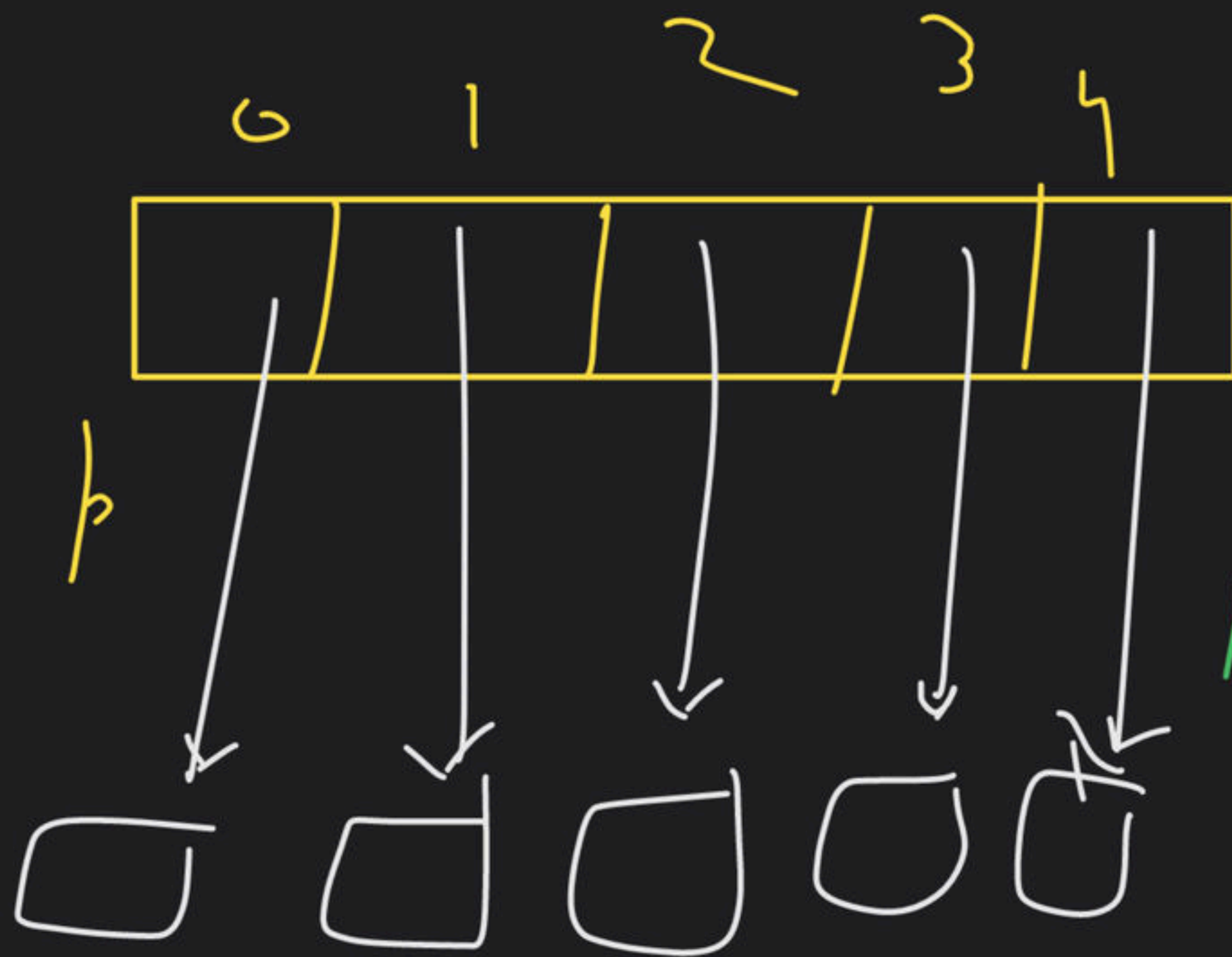


each element
of array is
an integer

`int *p[5];`

`(int *) p[5];`

`p[0]` = address
of int



each
element
is a
pointer to int

Happy Learning.!

