

Pointer to the first element of Array

Array of pointers $12+24+4$
 $= 40B$

`int arr[3] = {10, 20, 30};`

`int *ptr[3];`

`ptr[0] = &arr[0];`

`ptr[1] = &arr[1];`

`ptr[2] = &arr[2];`

`printf("%d", *ptr[0]);`

`printf("%d", *ptr[1]);`

`printf("%d", *ptr[2]);`

Pointer to whole Array $12+4+8$
 $24B$

`int (*ptr)[3] = &a;`

(Address of whole array)

`printf("%d", (*ptr)[0]);`

`printf("%d", (*ptr)[1]);`

`printf("%d", (*ptr)[2]);`

$= x$

Pointer to the first element of array $12+4+8$
 $= 24B$

`int *ptr = arr;`

// Address of arr

`printf("%d", *p);` $\Rightarrow 10$

`printf("%d", *(p+1));` $\Rightarrow 20$

`printf("%d", *(p+2));` $\Rightarrow 30$

`int arr[3] = {10, 20, 30};`

`int *ptr = arr;` OR `int *ptr = &arr[0];`

arr

10	20	30
100	104	108

ptr =

100

ptr

100

program 1:- Sum of array elements using pointer x

`int arr[5] = {10, 20, 30, 40, 50};`

`int sum = 0;`

`int *p = arr;`

10	20	30	40	50
100	104	108	112	116

// Traverse array using pointer to for loop

`for (int i = 0; i < 5; i++)`

// 0 1 2 3 4

`{ printf("%d", *(p+i));`

`sum = sum + *(p+i);`

i=0	0<5	* (p+0)	* (p)	* (100)	$\Rightarrow 10$
i=1	1<5	* (p+1)	* (104)		$\Rightarrow 20$
i=2	2<5	* (p+2)	* (108)		$\Rightarrow 30$
i=3	3<5	* (p+3)	* (112)		$\Rightarrow 40$
i=4	4<5	* (p+4)	* (116)		$\Rightarrow 50$

$sum = 0 + 10 = 10$
 $sum = 10 + 20 = 30$
 $sum = 30 + 30 = 60$
 $sum = 60 + 40 = 100$
 $sum = 100 + 50 = 150$

Output $\Rightarrow 10\ 20\ 30\ 40\ 50$

`printf("%d", sum);` $\Rightarrow 150$

Memory: $5 \times 4 + 4 + 8 = 20 + 4 + 8 = 32B$

Hkt# Find max value from int array using pointer.

Difference between two pointers (int)

`int arr[3] = {10, 20, 30};`

Memory = 12 Bytes

`int *ptr = arr;`

Memory = 8 Bytes

arr

10	20	30
100	104	108

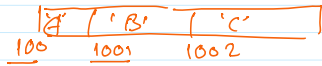
$(ptr+1) - (ptr)$

$104 - 100$

- 4 Bytes [this will tell difference of Bytes]
[We can calculate size of each element]

```
char arr[3] = {'A', 'B', 'C'};
```

```
char *ptr = arr;
```



$1001 - 100 = 1 \text{ Byte}$ [Size of each element is 1 Byte]
[Without using sizeof operator]