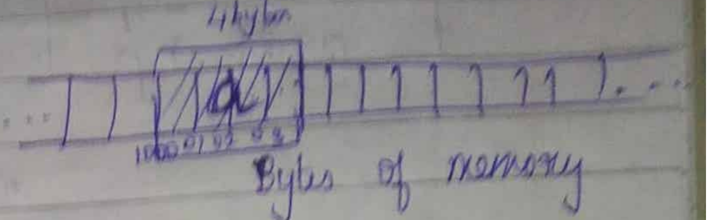
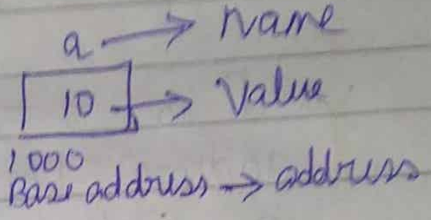
C-71 ⇒ Pointers in C ⇒ Part 1
Introduction to pointers

int a = 10;



int ⇒ 4 bytes



* This is normal variable, which holds the value.

Pointer variable :-

* Pointer is a special variable which holds address of other variables.

* It also comes under derived datatype

Declare Pointer variable :-

```
Datatype * pointer-name;

    int *p;
```

int *p; ⟺ int* p; ⟺ int * p;

* P is a pointer variable which stores address of a any other integer type variable.

* It is not that datatype of pointer is int (or) char.

```
float  *p
int    *p
char   *p
double *p
```

⇒ 'P' is a pointer variable which will only hold address of any other variable which is declared either float or int or char or double.

* P is a pointer variable which stores address of a variable whose datatype is integer or character or float or double.

<u>size of pointer</u> :-

16 bit → 2byte ; 32bit → 4bytes.

* size of pointer is 2 bytes or 4 bytes for 16 bit or 32 bit machine.

* size of pointer depends upon the machine.

<u>Initialize pointer variable</u> :-

```
int a = 10;
float b = 1.1;
char c = '1';
```

Example.

```
float x, y;
int a, *ptr;
```

✗ ptr = &x; (Wrong)

✓ ptr = &a; (Correct)

```
int *p;
```

$\boxed{p = \&a;}$ ✓ → * In 'P' we are going to store address of 'a' variable type int.

* So we put 'a'

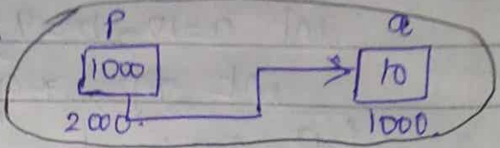
$\boxed{p = \&b;}$ ✗

$\boxed{P = \&c;}$ ✗

p = &b; ×

↳ because p is a pointer variable which is defined to hold only integer datatype, but datatype of b is character.

* Pointer variable will also take some memory in space.



p = &a; ⇒ ptr(p) is a pointer variable points to 'a'

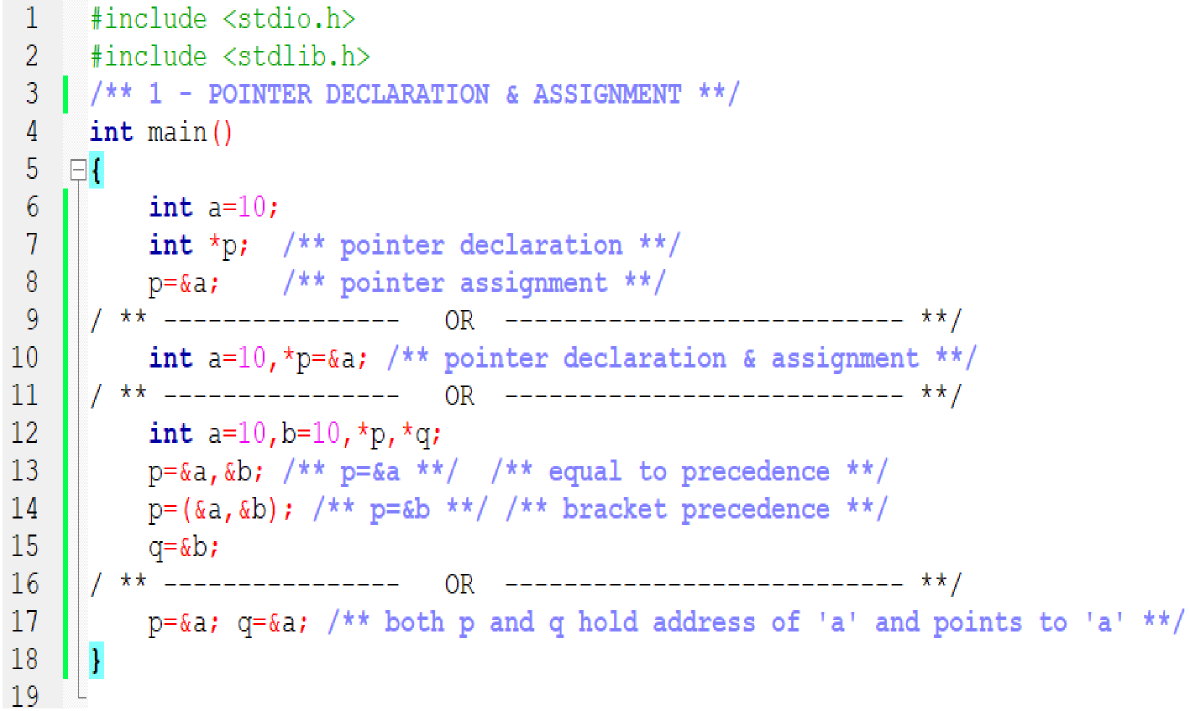
Pointer Declaration and Initialization :-

```
int a = 10;
* int *p; ⇒ Declaration

  p = &a; ⇒ Initialization

* int a = 10;
  int *p = &a; ⇒ Declaration + Initialization
                 in same step

  int a = 10, *p = &a; ✓
* int a, *p = &a; ✓ correct
  int *p = &a, a = 10; × wrong
```

All are same steps.

Here we don't declare a before pointer.

CODE 1:



```c
#include <stdio.h>
#include <stdlib.h>
/** 1 - POINTER DECLARATION & ASSIGNMENT **/
int main()
{
    int a=10;
    int *p;  /** pointer declaration **/
    p=&a;    /** pointer assignment **/
/ ** ----------------   OR  --------------------------- **/
    int a=10,*p=&a; /** pointer declaration & assignment **/
/ ** ----------------   OR  --------------------------- **/
    int a=10,b=10,*p,*q;
    p=&a,&b; /** p=&a **/  /** equal to precedence **/
    p=(&a,&b); /** p=&b **/ /** bracket precedence **/
    q=&b;
/ ** ----------------   OR  --------------------------- **/
    p=&a; q=&a; /** both p and q hold address of 'a' and points to 'a' **/
}
```