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Pointers in C++

⇒ Suppose we write a code like —

```
int a = 10;
```

10
a

⇒ So, if we want to print this 'a' then how the compiler will know where is a.

⇒ It can find a by the help of address.

⇒ So, now how it will get the address of a.

⇒ It can be get the address from the symbol table.

Symbol Table

Variable	Address
a	500
b	800

⇒ Let suppose, you have 4GB ram and there is a block of every 1 Byte in your ram & your memory is byte addressable

⇒ So, you have to give 2^{32} address.

$4GB = 2^{32}$ byte

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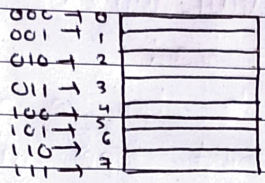
⇒ So if you have 8 byte RAM then —



⇒ So, 8 byte = $2^{③}$ byte (③ → no. of bits require)

⇒ So, we require 3 bits to address any location.

⇒ So, in 4GB RAM, we require 32 bits.

⇒ So, if you have 8 GB RAM (2^{33} bytes) then we don't use 33 bit instead use 64 bit system.

⇒ Because if ~~we~~ we use 33 bit then there are the chances of errors ~~that~~ in memory management.

⇒ We use every thing in $2^0, 2^1 \ldots$ (2 ki powers mei).

⇒ So, the stored 10 in the memory will take 4 bytes of storage or space.

⇒ If we want to ~~prevent~~ address of any variable ⟶ print cout << &a;

⇒ To store this address, we use pointers.

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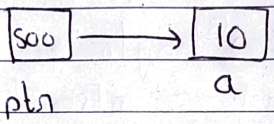
Syntax:

data_type *var_name;

=) int *ptr = &a;

=) ptr ek variable hai jo point kar rha hai ek int type ki value ko.



=) 0x → in the address shows that the address is in hexa decimal.

⇒ The address is store in Binary form but print in Hexa decimal form.

⇒ If you have 4GB RAM then the size of pointer is 4 byte.

=) And if you have more than 4GB RAM then the size of pointer is of 8 byte.

⇒ Then what is the use of mentioning datatype at the time of initializing pointer?

⇒ This is use to tell the pointer how much (block) it have to read. ~~after~~

Ex: if the type is int then it will read 4 byte, if char then 1 byte & so on.

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⇒ If we want to print the pointed value by any pointer then we use a reference pointer that is '*'.

Ex: cout << ptr; → print address
cout << *ptr; → print the value that at that address.