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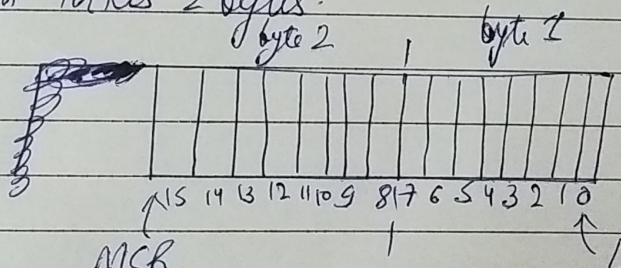
Data Types

- Primitive
  - Integral
    - int
    - char
  - bool
  - floating point
    - float
    - double
- User defined
  - enum
  - Structure
  - Union
  - Class
- derived
  - Array
  - Pointer
  - Reference

Data Types	Size	Range (for 2 bytes)
int	2 or 4	-32768 to 32767
float	4	-3.4×10^{-38} to 3.4×10^{38}
double	8	-1.7×10^{-308} to 1.7×10^{308}
char	1	-128 to 127
bool	undefined (1 or less)	true / false

⇒ int takes 2 bytes.



1 → -ve

0 → +ve

So total 15 slots left

⇒ $2^{15} = 32768$

⇒ -32767 ... 0 ... 32767 ⇒ Range -32768 to 32768

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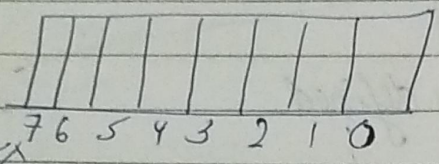
⇒ char takes 1 byte



$2^7 = 128$

0 to 127

⇒ -128 to 127

American Standard Code for Information Interchange

Char cannot be represented in binary system. Therefore ASCII gave all char & symbol denotion in binary form

For Ex

A → 65 > in Binary form (will display A but in memory it is 65)

B → 66

⋮

Z → 90

a → 97

b → 98

⋮

z → 122

⋮

0 → 48

1 → 49

⋮

9 → 57

⇒ Modifiers

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(i) unsigned → Used with int or char only

(a) unsigned int
$2^{16} \rightarrow 65536$
⇒ 0 to 65535 is the range

(b) unsigned char
$2^8 \rightarrow 256$
⇒ 0 to 255 is the range.

(ii) long

(a) long int — if int takes 2 bytes
long int will take 4 bytes.
— if int takes 4 long int will take 8 bytes

(b) long double
↳ 10 bytes
(Since double takes 8 which is double of float (4) already)