

## Types

→ int

→ float

↳ char

↳ string

1661 年

10

10.1

'A'

"ABC"

1 byte = 8 bit ←

$$2^{32} = \underline{1} \underline{1} \underline{1} \underline{0} \underline{0} \underline{1} \underline{1} \underline{1} \underline{1}$$

32 bit, 4 byte

`int a = 2;`  $\frac{1}{2} \frac{0}{2} \rightarrow 2 + 0 = 2$

## Binary-to-Decimal

## Binary

De cinn

Handwritten diagram illustrating the binary representation of 18:

18 is written above the binary sequence 00000010. The binary sequence is written in blue. An arrow points to the 10th bit (the 1), and another arrow points to the 9th bit (the 0). Below the binary sequence, the calculation  $16 + 2 = 18$  is shown, with 16 and 2 written inside a red oval.

64 32 16 8 4 2 1

16 8 4 2 1

X

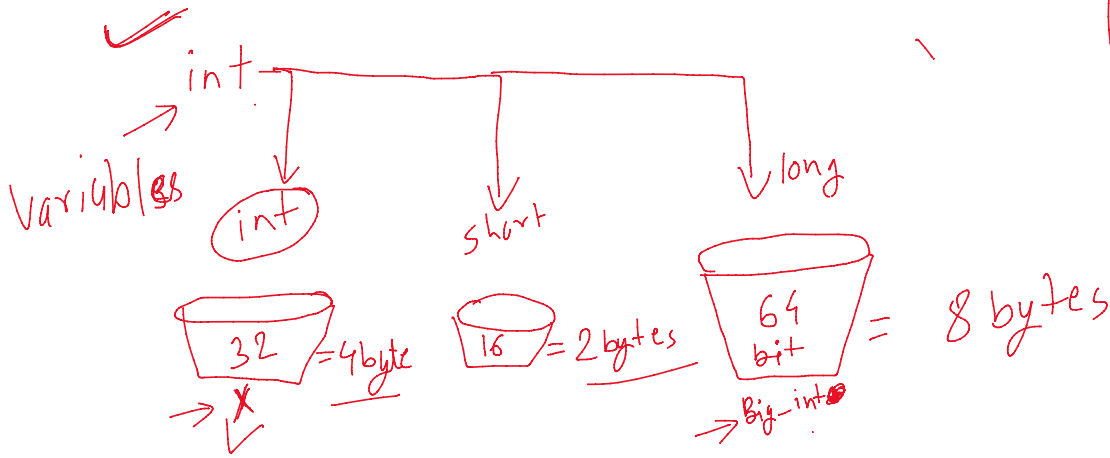
0 0 0 1 0

← 1 0 0 0 + 0 + 2 + 0 =

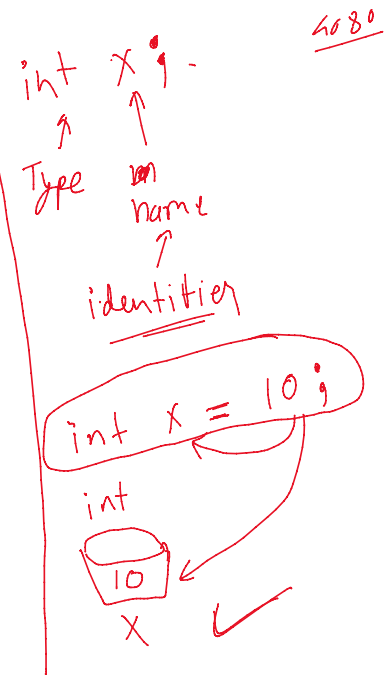
$$\begin{array}{cccc}
 & & \checkmark & \\
 & & 10 & 10 = \\
 & \swarrow & \downarrow & \downarrow & \searrow \\
 8 & & 4 & 2 & 1
 \end{array}$$

$$8 + 2 = \cancel{10}$$

$2^n$   
 $2^0 \quad 2^1 \quad 2^2$   
 $\downarrow \quad \downarrow$   
 $1, 2, 4$



= 12341478191978881932  
 → 48 bit, 6 bytes



Data Type	Size (in bytes)	Range
short int	2	-32,768 to 32,767
unsigned short int	2	0 to 65,535
unsigned int	4	0 to 4,294,967,295
int	4	-2,147,483,648 to 2,147,483,647
long int	4	-2,147,483,648 to 2,147,483,647
unsigned long int	8	0 to 4,294,967,295
long long int	8	-(2 <sup>63</sup> ) to (2 <sup>63</sup> )-1
unsigned long long int	8	0 to 18,446,744,073,709,551,615
signed char	1	-128 to 127
unsigned char	1	0 to 255
float	4	
double	8	
long double	12	
wchar_t	2 or 4	1 wide character