

Data types:

integer {
int $\rightarrow$ 4 bytes (1 byte 8 bits): 32 bits (smaller execution time)
byte = 1 byte $[-128, 127]$ words = 4 bytes
short = 2 byte $[-32,768, 32,767]$ half word = 2 byte
long = 8 bytes

floating points {
float = 4 bytes
double = 8 bytes

Char = unicode 2 bytes

boolean = 1 bit

Note: They are all primitives

$\rightarrow$ String str1; (Not primitive)

$\rightarrow$ $\underbrace{+ - / *}_{2^{nd}} \underbrace{\% /}_{1^{st} \text{ priority}} \underbrace{= /}_{3^{rd}}$ (operator operand)

* $a = b + c + d;$ (Left to right).

$\Downarrow$

$a = (b + c) + d$

* $a = b + c / d * e$

$\Downarrow$
 $a = [b + ((c / d) * e)];$

* $b = \sqrt{a}$

$b = \text{Math.sqrt}(a);$

* $a = x^y$

$a = \text{Math.pow}(x, y);$

They need to be double

int a = 2; ^{literal}
 double b = 2; ^{implicit conversion}

int a = 15.87; (Error)
 int a = (int) 15.87; = 15
 double a = 2/3; ₀ (type casting)
 double a = (double) 2/3;
_{0.666}

Binary Numbers:

Base 4:
 0 1 2 3
 00 01 10 11
 (123)₄

32201₄ = 11 10 10 00 01₂

hex = 16 2⁴

hex:	bin:	hex:	bin:
0	0000	8	1000
1	0001	9	1001
2	0010	A	1010
3	0011	B	1011
4	0100	C	1100
5	0101	D	1101
6	0110	E	1110
7	0111	F	1111

2³ 2² 2¹ 2⁰

AB27
 ↓ ↓ ↓ ↓
 1010 1011 0010 0111

$\overline{0110} \overline{1101}$ (Group binary to hex)
 $\text{b} \quad \text{D}$

$\underbrace{001010101}_2 \cdot \underbrace{010111011100}_D \rightarrow 205.00$

Decimal to Binary:

$$24 = x_2$$

$$\frac{24}{2} = 12$$

Rest: 0

$$24 = 11000$$

$$\frac{12}{2} = 6$$

$$\frac{6}{2} = 3 \quad 0$$

$$\frac{3}{2} = 1 \quad 1$$

$\frac{1}{2} = 0,5$

what about Fractional Part?

$$\begin{array}{r} 0.6825_{10} \\ \times \quad 2 \\ \hline \end{array}$$

Let's look 5. $\overbrace{68+5}_{10} = ? \rightarrow 101.1011_2$

$$\begin{array}{r} 1,3750 \\ - \\ \hline \end{array}$$

0,7500

$$\underline{x \quad \quad \quad 2}$$

$$\begin{array}{r} 1,500 \\ - \quad 2 \end{array}$$

x

1,000
- w
stop!

What about?

0.35 $\rightarrow x_2$?

$$\begin{array}{r} 0.35 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 0.7 \\ - 2 \\ \hline \end{array}$$

$$\begin{array}{r} 114 \\ \times 2 \\ \hline \end{array}$$

$$\frac{0.8}{2}$$

1. 6

$$\frac{2}{2}$$

$$\frac{2}{1}$$

9
.
i

So $0.35 = 0.01011001100110$