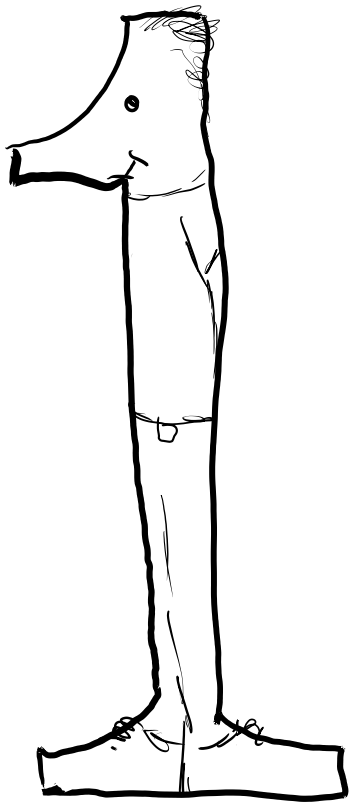
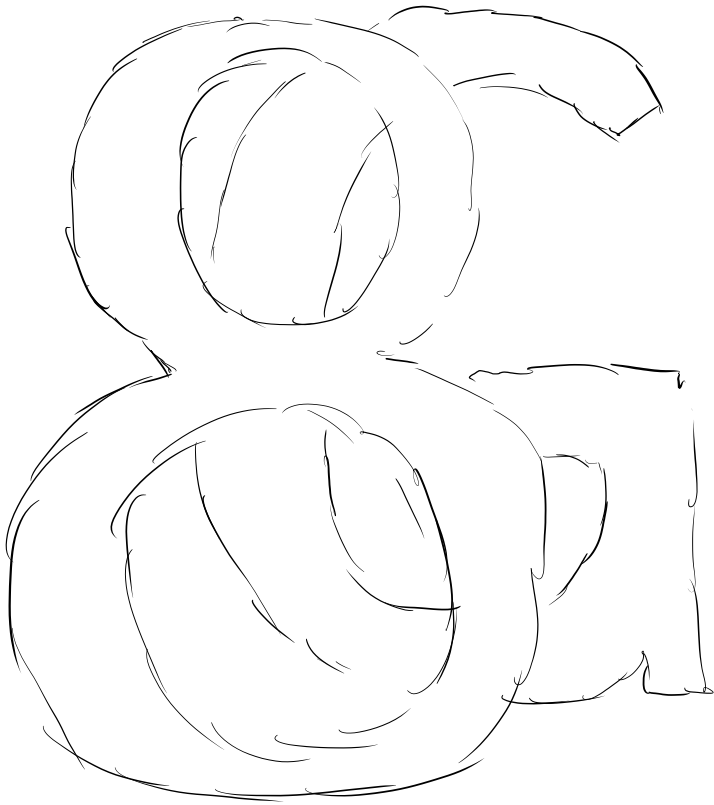
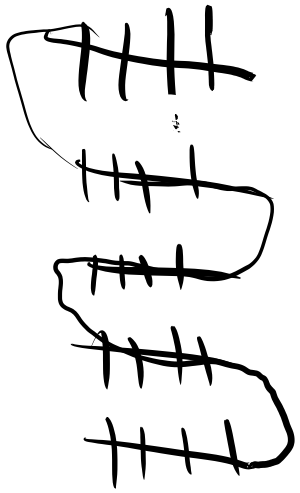
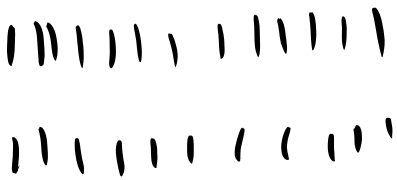






V X L C D M



10^3 10^1

thousand ten

2501

hundred ones

10^2 10^0

10^n

X

n

0 1 2 3 4 5 6 7 8 9 A B

base-10

decimal

base 8

Octal

base - 8
Octal

8^2 8^1 8^0
1 2 3

83

4705

$3 \cdot 1 + 2 \cdot 8 + 1 \cdot 64$
16

base - 1 = tally

binary

base-2

64 32 16 8 4 2 1

1011001 → 89

```
  1 1 1
  1011001
+ 1100101
----------
 10010110
```

```
  1 1
  83
+197
-----
 280
```

```
      1 1 0 1 0 1
    x   1 1 0 0 1 0 1
    -----------------
        1 1 0 1 0 1
      0 0 0 0 0 0
    1 1 0 1 0 1
  1 1 0 ——— 0
  1   0 ——— 0
    1 1 0 1 0 1
  1 1 0 1 0 1
-----------------------
1 0 1 0 0 1 1 1 0 1 0 0 1
```

```
    1 1 1
    1 1 1
      1 1
      1 1
    + 1 1
    -----
      1 0 0
```

2501

- 2048

453

- 256

197

- 128

69

- 64

5

1001111000101

100,111,000,101

octal = 4 7 0 5

1001,1100,0101

hexadecimal = 9 C 5

1, 3, 5, 7, 9, B, D, F

0, 2, 4, 6, 8, A, C, E

	common	new
binary	no syntax	0b1011101
octal	0123	0o123
decimal	123	123
hexadecimal	0x123AC	0x123AC

negative

$$
\begin{array}{r}
101 \\
-101 \\
\hline
\end{array}
$$

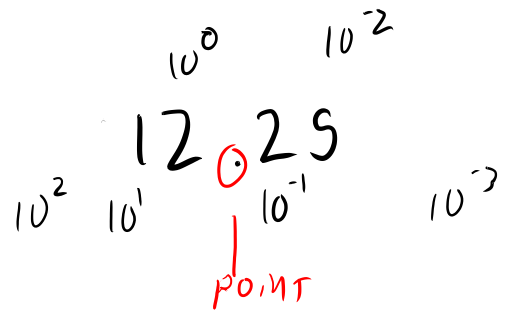
$$
\begin{array}{r}
{\scriptstyle 1} \\
\ldots 0 \ldots 00000000 \\
- \qquad\qquad 1 \\
\hline
\ldots 9 \ldots 99999999
\end{array}
$$

2's complement

Signed integer

$$
\begin{array}{r}
{\scriptstyle 1\ 1\ 1\ 1\ 1} \\
00000000 \\
- \qquad\qquad 1 \\
\hline
11111111 \\
\\
- \qquad\qquad 1 \\
\hline
11111110
\end{array}
$$

Non - integer



0.3333... 33...

0.0101010...

binary 1011.1011

2501

always 1

$11\frac{11}{16}$

$11\frac{23}{32}$

floating point $\pm 1.01110111 \times 2^{3}$

3 — exponent signed

± — 1 bit

01110111 — fraction mantissa

2.501×10^3

IEEE flat