CS631-02 Binary Bases Bitwise 2026-02-17

Lab02 due tonight 11:59pm

autograder-rust -vv

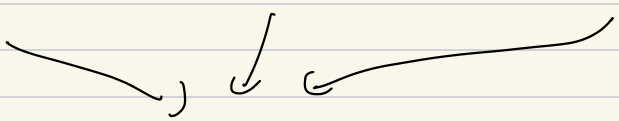
GitHub IDs / usernames

Project01 - NTlang

ntlang -e "1+2" -b 16

ntlang script.ntl

binary "0b1100" decimal "12" Hexadecimal "0xC"



uint32_t v

Decimal 735

$7 \times 10^2 + 3 \times 10^1 + 5 \times 10^0$

Binary 1010

$1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0$

Two's Complement

3-bit binary values

Binary	unsigned dec	Signed mag	Two's Comp
000	0	0	0
001	1	1	1
010	2	2	2
011	3	3	3
100	4	-0	-4
101	5	-1	-3
110	6	-2	-2
111	7	-3	-1

MSB (sign)

Two zeros

```
if (x==0) {
}
beq a0,zero,L
```

pos → neg → pos

invert and add 1

```
  010  (2)
inv 101
+     1
  110  (-2)
```

signed mag

3 + (-1) = 2

```
  1 11
  011
+ 101
-----
  000
```

3 + (-1)

```
  1 1
  011   (3)
+ 111   (-1)
-----
  010   (2)
```

uint32_t x;

x_[3] = 1;

<<

int32_t x

uint32_t x

>>

↓

x >> 2

↑ LSR

ASR

w = 8

mask = (1 << w) - 1

(100000000) - 1

= 011111111