Converting floats to ints

CS520

Dept. of Computer Science
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f2i example 47AAAAAA → int

0100 0111 | 1010 1010 1010 1010 1010 1010

128
15
143
−127
16

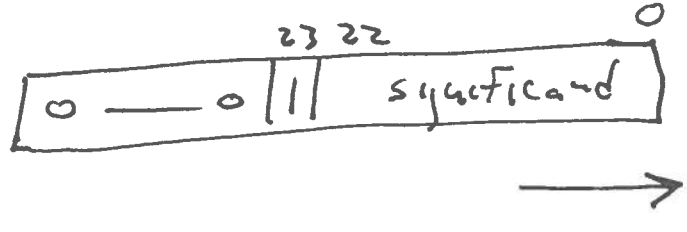
$1.0101010101010101010 \times 2^{16}$

$1010101010101010.1010101010 \times 2^{0}$

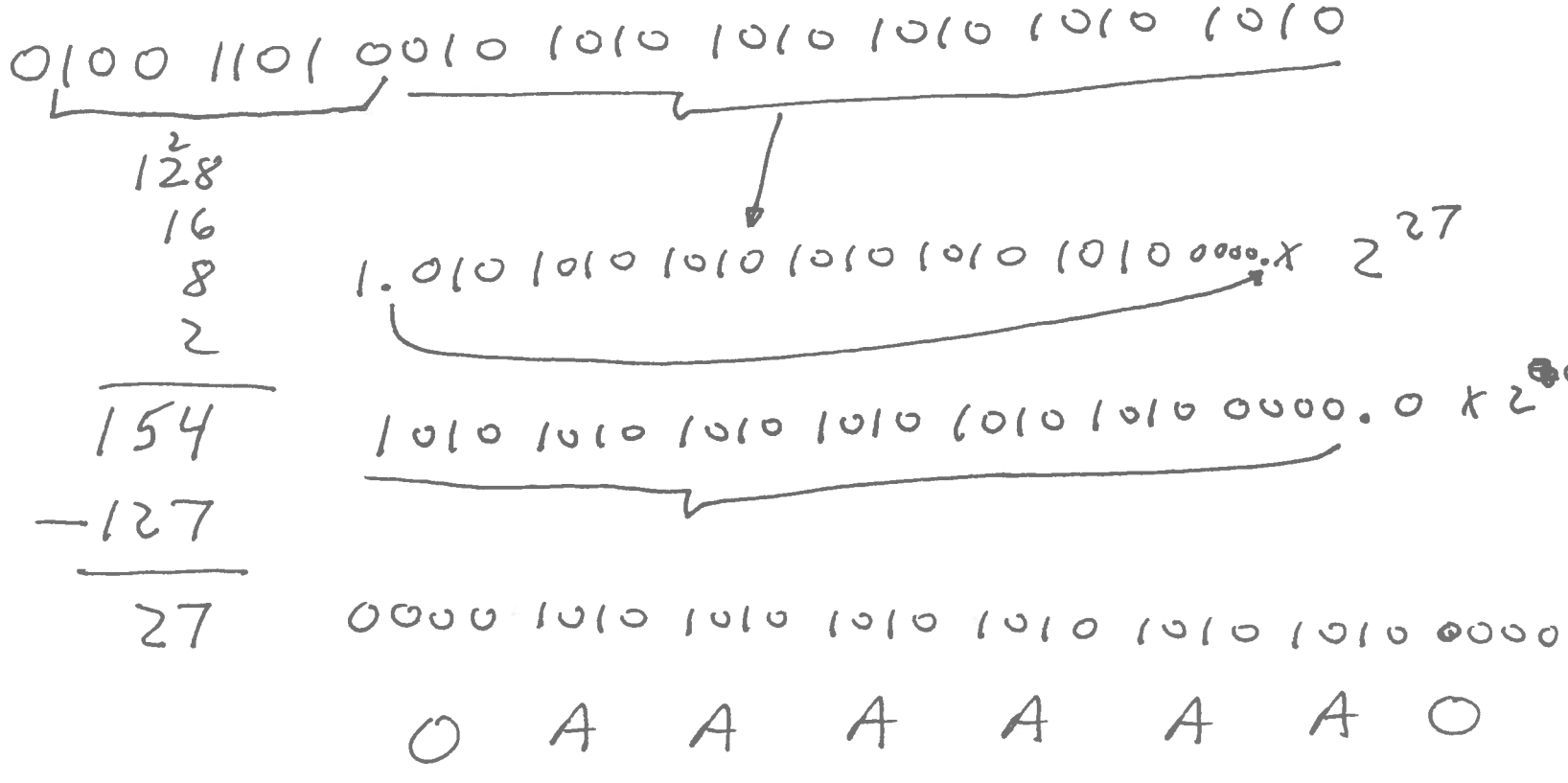
0000 0000 0000 0000 | 1010 1010 1010 1010

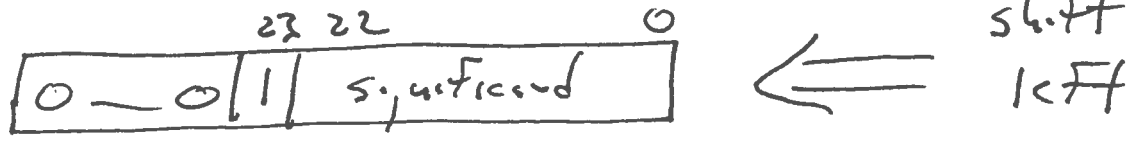
0 0 0 0 1 5 5 5 5

if value had been negative, then convert the value as shown and then negate the result



f2i example: 4D2A AAAA → int





f2i example 4FAAAAAA → int

0 100 1111 1010 1010 1010 1010 1010 1010

128
16
15
159
−127
32

$(1.)010\ 1010\ 1010\ 1010\ 1010\ 1010 \times 2^{32}$

2 shift left 32 bit positions
the result will overflow the
32-bit integer container!

80000000

↳ most negative value

f2i: other cases

exponent all zero bits → return 0

0.0

denormalized - a value close to zero

$0.f \times 2^{-126}$

exponent all one bits → return 80000000

NaN

Infinity

exponent less than zero $1.\square \times 2^{-4}$

→ return 0