

Printing the binary representation of a number

31-2a

a : 1 0 1 1 0
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 a div 2 a mod 2

PrintBinary (a: integer)

 LastBit := a mod 2

 if (a div 2) > 0 then

 PrintBinary (a div 2)

 write (LastBit)

end;

Computation of X^a

31-2b

$$n = \lfloor \lg a \rfloor + 1$$

Example:

Step 1: compute

X^1	X^2	X^4	X^8	...	$X^{2^{n-1}}$
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a = 25_d

Step 2: compute

a_0	a_1	a_2	a_3	...	a_{n-1}
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$$n = \lfloor \lg 25 \rfloor + 1 = 5$$

Step 3: s := 1

X^1	X^2	X^4	X^8	X^{16}
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for i = 0 to n-1 do

1	0	0	1	1
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 if $a_i = 1$ then $s := s * X^{2^i}$

s := 1

s := s * X^1

s := s * X^8

s := s * X^{16}

⇒ $O(n) = O(\lg a)$ time

