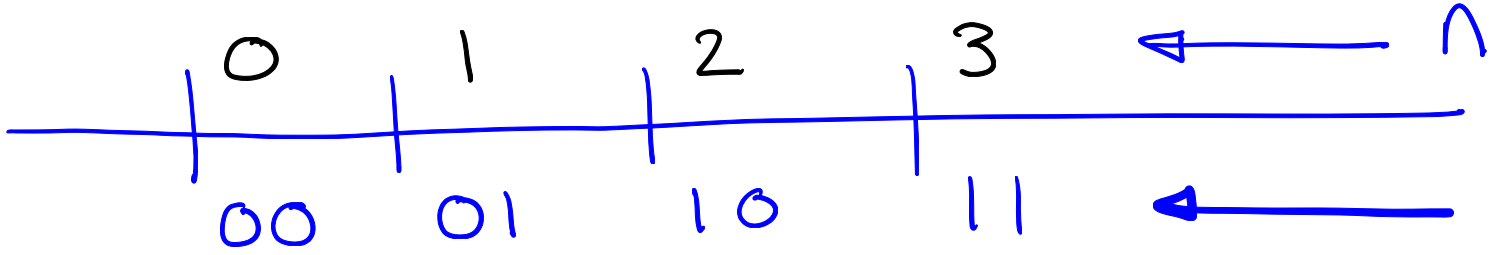
SU4 Q+A.

[27,28]

[27] - [32]

Binary numbers	101	101011
Denary numbers	645	165479
Hex numbers	1AC	ABCDEF
	3-digit	6-digit



$n \in \mathbb{N}$

all 2-digit binary numbers

$0 \leqslant n \leqslant 2^k - 1$ in the case above? $= 3$

— What is the largest 18-digit binary number in denary ? ②

-1=262,143

A: 262,144 = 262,144

[29] $\vec{d}$ is a variable binary number

(c.f. $z \in \mathbb{Z}$)

positions, i

For example $\vec{d} = {}^{3}{}^{2}{}^{1}{}^{0}1011$ ($z = 44$)

What is the length of $\vec{d}$? 4

In the example, $d_3 = 1$ $d_1 = 1$ $d_0 = 1$ $d_{-1} = 0$

2

If $\vec{d} = 110$ then $0 \leq i \leq 2$ ③

We have $d_2 = 1$ $d_1 = 1$ $d_0 = 0$

Notice that $\vec{d} = d_2\, d_1\, d_0$

(pattern matching)

[30, 31] Convert binary to denary.

HM 1 0 1 1 1

$(10111)_b =$

CM Given $\vec{d} = 011$, $k = 3$ ④

[30]

i	2	1	0
d_i	0	1	1
2^i	4	2	1
$d_i * 2^i$	0	2	1

Sum final row $011_b = 0+2+1 = 3$

$d_2 * 2^2 + d_1 * 2^1 + d_0 * 2^0$

$k-1 = 1$

[31]

If $\vec{d} = d_1 d_0$ then

$\vec{d}_b = 2 * d_1 + 1 * d_0$

Hence

$11_b = 1 * 2 + 1 * 1 = 2$

$10_b =$ you do this... $1 * 2 + 0 * 1 = 2$