

# 4.5.1 mapping read values on bit strings

Q:  $[0, 10] \rightarrow 3 \text{ bit}$

$$f(a_1, \dots, a_L) = x + \frac{y-x}{2^L-1} \left( \sum_{j=0}^{L-1} a_{L-j} \cdot 2^j \right) \in [x, y]$$

Solution

①  $x = 0$

$y = 10$

$L = 3$

$$\begin{aligned} f(a_1, a_2, a_3) &= 0 + \frac{10-0}{2^3-1} \left( \sum_{j=0}^2 a_{3-j} \cdot 2^j \right) \\ &= \frac{10}{7} (a_3 + a_2 \cdot 2 + a_1 \cdot 2^2) \end{aligned}$$

equal to 10 进制

3 bit	10 进制	Mapping to $[0, 10]$
000	0	0
001	1	1.43
010	2	2.86
011	3	4.29
100	4	5.71
101	5	7.14
110	6	8.57
111	7	10