

a) 2-dimensional grid  $(L_1, L_2)$   
coordinate  $x_i \in \{0, 1, 2, \dots, L_i - 1\}$

set  $L_0 = 1$

for known coordinates  $x_i$

$$\text{index} = \sum_{i=1}^2 x_i L_{i-1}$$

for known index

$$x_2 = \text{int}(\text{index} / L_1)$$

$$x_1 = \text{index} \bmod L_1$$