

Mathematical Equation

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7.1

① $\text{Index} = L_1 * X_2 + X_1$ Converting coordinates to index

② $X_2 = \text{Index} \bmod L_1$ Converting index to coordinates

$$X_1 = (\text{Index} - X_2) / L_1$$

7.2

① $\text{Index} = X_1 + X_2 * L_2 + X_3 * L_1 * L_2 + X_4 * L_1 * L_2 * L_3 + X_5 * L_1 * L_2 * L_3 * L_4$
 $+ X_6 * L_1 * L_2 * L_3 * L_4 * L_5$ Converting coordinates to index

② $X_6 = \text{Index} / (L_1 * L_2 * L_3 * L_4 * L_5)$

$$X_5 = (\text{Index} - X_6 * L_1 * L_2 * L_3 * L_4 * L_5) / (L_1 * L_2 * L_3 * L_4)$$

$$X_4 = (\text{Index} - X_6 * L_1 * L_2 * L_3 * L_4 * L_5 - X_5 * L_1 * L_2 * L_3 * L_4) / (L_1 * L_2 * L_3)$$

$$X_3 = (\text{Index} - X_6 * L_1 * L_2 * L_3 * L_4 * L_5 - X_5 * L_1 * L_2 * L_3 * L_4 - X_4 * L_1 * L_2 * L_3) / (L_1 * L_2)$$

$$X_2 = (\text{Index} - X_6 * L_1 * L_2 * L_3 * L_4 * L_5 - X_5 * L_1 * L_2 * L_3 * L_4 - X_4 * L_1 * L_2 * L_3 - X_3 * L_1 * L_2) / (L_1)$$

$$X_1 = (\text{Index} - X_6 * L_1 * L_2 * L_3 * L_4 * L_5 - X_5 * L_1 * L_2 * L_3 * L_4 - X_4 * L_1 * L_2 * L_3 - X_3 * L_1 * L_2 - X_2 * L_1)$$

Converting index to coordinates

* when we want to convert given index to coordinates, we can calculate the coordinates from back to front. Taking this problem as an example, in the equation in 7.2.①, we can treat the part of $(X_1 + X_2 * L_2 + X_3 * L_1 * L_2 + X_4 * L_1 * L_2 * L_3 + X_5 * L_1 * L_2 * L_3 * L_4)$ as Remainder, so we can directly divide index by the coefficient of X_6 to get its value. Then substitute it in the equation, and deduct the corresponding index, and then calculate X_5 until coordinates are calculated.