

## 基本情况

$$\begin{aligned}
 \frac{1}{1+y} &= \frac{1-y}{1-y^2} \\
 &= \frac{(1-y)(1+y^2)}{1-y^4} \\
 &= \dots \\
 &= \frac{(1-y)(1+y^2) \dots (1-y^{2^k}) \dots}{1-y^{2^{k+1}}} \\
 &\approx (1-y)(1+y^2) \dots (1-y^{2^k}) \dots
 \end{aligned}$$

## 查表法

$$\begin{aligned}
 \frac{1}{x} &= \frac{2^k}{x \cdot 2^k} \\
 &= \frac{2^k}{\lfloor x \cdot 2^k \rfloor + x_0} \\
 &= \frac{2^k}{n + x_0} \\
 &= \frac{\frac{2^k}{n}}{1 + \frac{x_0}{n}} \\
 &= \frac{\frac{2^k}{n}}{1 + y}
 \end{aligned}$$

$$n = \lfloor x \cdot 2^k \rfloor, x_0 = x \cdot 2^k - n$$

$$y = \frac{x_0}{n} = \frac{x \cdot 2^k - n}{n} = \frac{x \cdot 2^k}{n} - 1$$

( $\frac{1}{n}$  or  $\frac{2^k}{n}$  can be preprocessed)