基本情况

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

查表法

$$\begin{aligned}
\frac{1}{x} &= \frac{2^k}{x \cdot 2^k} \\
&= \frac{2^k}{\lfloor x \cdot 2^k \rfloor + x_0} \\
&= \frac{2^k}{n + x_0} \\
&= \frac{\dfrac{2^k}{n}}{1 + \dfrac{x_0}{n}} \\
&= \frac{\dfrac{2^k}{n}}{1 + y} \\
&(\frac{1}{n} \text{ or } \frac{2^k}{n} \text{ can be preprocessed})
\end{aligned}$$

$$n = \lfloor x \cdot 2^k \rfloor, x0 = x \cdot 2^k - n$$

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