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Testfrage:

$$\lceil \log_2 (n+1) \rceil$$

Warum ...+1?

$$\lceil \log_2 (\lceil (n+1)/2 \rceil) \rceil$$

Warum kein +1?

Seite 27 Errinerung: Iversons Notation

$$[n \equiv 0(2)] := \begin{cases} 1 & \text{wenn } n \equiv 0 \pmod 2 \\ 0 & \text{wenn } n \not\equiv 0 \pmod 2 \end{cases}$$

$n = 2k$ $\quad \left\lceil \frac{n+1}{2} \right\rceil = \left\lceil \frac{2k+1}{2} \right\rceil = \left\lceil k + \frac{1}{2} \right\rceil = k+1$

$$\frac{n+1}{2} + \frac{[n \equiv 0(2)]}{2} = \frac{2k+1}{2} + \frac{1}{2} = k+1$$

$n = 2k+1$ $\quad \left\lceil \frac{n+1}{2} \right\rceil = \left\lceil \frac{2k+2}{2} \right\rceil = k+1$

$$\frac{n+1}{2} + \frac{[n \equiv 0(2)]}{2} = \frac{2k+2}{2} + 0 = k+1$$

$$\Rightarrow \lceil (n+1)/2 \rceil = \frac{n+1}{2} + \frac{[n \equiv 0(2)]}{2}$$

$$\lceil x + k \rceil = \lceil x \rceil + k, \quad \forall x \in \mathbb{R}, \forall k \in \mathbb{Z} \quad \Rightarrow$$

$$1 + \lceil \log_2 \lceil (n+1)/2 \rceil \rceil = \left\lceil 1 + \log_2 \left(\frac{n+1}{2} \cdot \frac{n+1 + [n \equiv 0(2)]}{n+1} \right) \right\rceil =$$

$$= \left\lceil \underbrace{\log_2 2}_{=1} + \log_2 \frac{n+1}{2} + \log_2 \left(1 + \frac{[n \equiv 0(2)]}{n+1} \right) \right\rceil = \left\lceil \log_2 2 \cdot \frac{n+1}{2} \cdot \left(1 + \frac{[n \equiv 0(2)]}{n+1} \right) \right\rceil$$

$\log_2 x \cdot y = \log_2 x + \log_2 y$ $\qquad$ $\log_2 x + \log_2 y = \log_2 x \cdot y$

$n = 2^r - 2 \mapsto r$, d.h. $\lceil \log_2 (2^r - 2 + 1 + 1) \rceil = r$ und

$$\lceil \log_2 (2^r - 2 + 1) \rceil = r$$

Warum?