

$$T(n) = a T\left(\frac{n}{b}\right) + f(n)$$

$$1. T(n) = T\left(\frac{n}{2}\right) + n(2 - \cos n)$$

$$2. T(n) = 64 T\left(\frac{n}{8}\right) - n^2 \log(n)$$

$$3. T(n) = 2^n T\left(\frac{n}{2}\right) + n^n$$

$$4. T(n) = 0,5 T\left(\frac{n}{2}\right) + \frac{1}{n}$$

$$5. T(n) = 7 T\left(\frac{n}{3}\right) + n^2$$

$$6. T(n) = 16 T\left(\frac{n}{4}\right) + n!$$

$$7. T(n) = \sqrt{2} T\left(\frac{n}{2}\right) + \log n$$

$$8. 2 T\left(\frac{n}{4}\right) + n^{0,51}$$

$$1. \quad a=1 \quad b=2 \quad f(n)=$$

$$2. T(n) = 64 T\left(\frac{n}{8}\right) - n^2 \log(n)$$

$$a=64 \quad b=8 \quad f(n) = -n^2 \log(n) \rightarrow \text{ist für } n > 1 \text{ negativ}$$

$\Rightarrow$  MASTERTHEOREM nicht anwendbar

$$3. \quad T(n) = 2^n T\left(\frac{n}{2}\right) + n^n$$

$a = 2^n$   $a$  muss eine Konstante sein,  $\Rightarrow$  MT nicht anwendbar

$$4. T(n) = 0,5 T\left(\frac{n}{2}\right) + \frac{1}{n}$$

$$a = \frac{1}{2} \quad b = 2 \quad f(n) = \frac{1}{n}$$

$$\log_2 \frac{1}{2} \Rightarrow n^{\log_2 \frac{1}{2}} = n^{-1} = \frac{1}{n}$$

Fall 2:  $f(n) = \Theta(n^{\log_b a})$

$$\frac{1}{n} = \Theta(n^{-1})$$

$$\frac{1}{n} = \Theta\left(\frac{1}{n}\right) \quad \checkmark$$

$$\Rightarrow T(n) = \Theta\left(\frac{1}{n} \cdot \log(n)\right)$$